

SECOND EDITION

# STUDENT BOOK

GRADE

4

*Published by*



The MATH LEARNING CENTER *Salem, Oregon*

## **Bridges in Mathematics Second Edition Grade 4 Student Book Volumes 1 & 2**

The Bridges in Mathematics Grade 4 package consists of:

Bridges in Mathematics Grade 4 Teachers Guide Units 1–8  
Bridges in Mathematics Grade 4 Assessment Guide  
*Bridges in Mathematics Grade 4 Teacher Masters*  
Bridges in Mathematics Grade 4 Student Book Volumes 1 & 2  
Bridges in Mathematics Grade 4 Home Connections Volumes 1 & 2  
*Bridges in Mathematics Grade 4 Teacher Masters Answer Key*  
*Bridges in Mathematics Grade 4 Student Book Answer Key*  
*Bridges in Mathematics Grade 4 Home Connections Answer Key*  
Bridges in Mathematics Grade 4 Components & Manipulatives  
*Bridges Educator Site*  
Work Place Games & Activities

Number Corner Grade 4 Teachers Guide Volumes 1–3  
*Number Corner Grade 4 Teacher Masters*  
Number Corner Grade 4 Student Book  
*Number Corner Grade 4 Teacher Masters Answer Key*  
*Number Corner Grade 4 Student Book Answer Key*  
Number Corner Grade 4 Components & Manipulatives  
Word Resource Cards

*Digital resources noted in italics.*

The Math Learning Center, PO Box 12929, Salem, Oregon 97309. Tel 1 (800) 575-8130  
[www.mathlearningcenter.org](http://www.mathlearningcenter.org)

© 2016 by The Math Learning Center

All rights reserved.

Bridges and Number Corner are registered trademarks of The Math Learning Center.

Prepared for publication using Mac OS X and Adobe Creative Suite.

Printed in the United States of America.

To reorder this book, refer to number 2B4SB5 (package of 5).

QBB4901 (1 & 2)

Updated 2016-05-27.

The Math Learning Center grants permission to reproduce and share print copies or to share electronic copies of the materials in this publication for use in the classroom for which the publication was purchased. Licensed users may share print or electronic copies of the materials with other district staff and teachers and with students and their families in support of implementation in the classroom for which the materials were purchased. All other uses and distribution of the materials are expressly prohibited, and you may not make print or electronic copies of the materials available for public access. For usage questions, please contact The Math Learning Center.

*Bridges in Mathematics* is a standards-based K–5 curriculum that provides a unique blend of concept development and skills practice in the context of problem solving. It incorporates Number Corner, a collection of daily skill-building activities for students.

The Math Learning Center is a nonprofit organization serving the education community. Our mission is to inspire and enable individuals to discover and develop their mathematical confidence and ability. We offer innovative and standards-based professional development, curriculum, materials, and resources to support learning and teaching. To find out more, visit us at [www.mathlearningcenter.org](http://www.mathlearningcenter.org).

ISBN 978-1-60262-533-4

# Student Book Volumes 1 & 2

## Unit 1

### Multiplicative Thinking

More School Supplies .....	1
How Many Pencils? .....	2
How Many Pens? .....	3
How Many Erasers? .....	4
Claudia’s School Supplies .....	5
Crayons & Story Problems Sheet .....	6
More Crayons .....	7
Broken Lid Crayons Sheet .....	8
Camping Story Problems .....	9
Sandwiches & Pizza .....	11
Division Models .....	12
Arranging School Supplies .....	14
Thinking About Factors .....	15
Recording Factors .....	16
Factors of 36 .....	17
Multiplication Table .....	18
Work Place Instructions 1A Cover Up .....	19
Class Quilt .....	20
Work Place Instructions 1B Arrays to One Hundred .....	21
Seashells .....	22
Multiplying by 4 & 6 .....	23
Work Place Instructions 1C The Multiple Wheel .....	24
The Multiple Wheel .....	25
Work Place Instructions 1D	
Spinning Around Multiplication .....	26
Games Problems .....	27
Work Place Instructions 1E Products Four in a Row .....	28
Product Wheels .....	29
Multiplication & Division Facts .....	30
More Multiplicative Comparisons at the Giant’s Door ...	31
Drawing Comparisons & Writing Equations .....	33
Work Place Instructions 1F Dragon’s Gold .....	34
More Multiplicative Comparisons .....	35
All in the Family .....	36
Linear Measurement .....	37
Measuring Materials .....	40
Weight & Mass Benchmarks .....	41
Weight & Mass Story Problems .....	42
Comparing Quantities .....	43

## Unit 2

### Multi-Digit Multiplication & Early Division

Place Value & The Great Wall .....	44
Base Ten Area Pieces .....	45
Multiplicative Comparisons on the Wall .....	46
Finding Areas of Rectangles .....	47
A New Room for Nick .....	48
Work Place Instructions 2A What’s Missing? Bingo .....	49
Flora Tries Again .....	50
Arrays & Equations for Tens .....	51
Multiplication Arrays .....	52
Fill the Frames .....	53
Work Place Instructions 2B Division Capture .....	54
Groceries & Laundry .....	55
Estimate & Sketch .....	56
Multiplication Arrays .....	58
Multiplying by Ten, One Hundred & One Thousand .....	59
Multiplication Practice .....	61
Ratio Table Equations .....	62
Ratio Table Practice .....	63
More Multiplication .....	64
Riley’s & Raymond’s Ratio Tables .....	65
Maggie’s Chickens .....	66
Eggs & Apples .....	67
Mario’s Marbles .....	68
How Can You Solve . . . ? .....	69
Work Place Instructions 2C Moolah on My Mind .....	70
How Much Money? .....	71
Money Multiple Wheel .....	72
Multiplication Tables .....	73
Sharing Problems .....	74
Work Place Instructions 2D Remainders Win .....	75
Multiplying with Money .....	76
Work Place Instructions 2E	
More or Less Multiplication .....	77
Fourth Grade Games .....	79
Multiplication & Division Practice .....	80

## Unit 3

### Fractions & Decimals

Skills Practice .....	81
Fair Shares.....	82
Share & Share Alike.....	84
Fractions & Mixed Numbers .....	85
Fractions & Mixed Numbers on a Number Line.....	87
Fractions & Division Tables.....	88
Dividing an Egg Carton .....	89
Egg Carton Recording Paper.....	90
Comparing Fractions.....	91
Modeling Egg Carton Fractions .....	92
Equivalent Fractions .....	93
Eggsploration Challenge .....	95
More Egg Carton Fractions .....	96
Pizza Party Planning .....	97
Last Equation Wins.....	98
What's the Share?.....	100
Comparing, Adding & Subtracting Fractions.....	101
Adding & Subtracting Fractions.....	103
Introducing Dozens of Eggs .....	104
Work Place Instructions 3A Dozens of Eggs.....	105
Egg Carton Fractions .....	107
How Many Candy Bars? .....	108
Fractions & Mixed Numbers .....	109
Work Place Instructions 3B Racing Fractions .....	110
Understanding Fractions & Mixed Numbers.....	111
Decimals Are Fractions .....	112
Money, Decimals & Fractions .....	114
Comparing Decimals & Fractions .....	115
Number Riddles.....	117
Work Place Instructions 3C Decimal Four Spins to Win .....	118
Tenths & Hundredths.....	119
Work Place Instructions 3D Decimal More or Less.....	120
Decimal More or Less Challenges.....	121
Decimal & Fraction Relationships.....	122
Decimals Are Fractions .....	124
Work Place Instructions 3E Fractions & Decimals.....	125
Using Pictures to Compare Decimals & Fractions .....	126
Ordering Decimals & Fractions.....	127
Jared's Problems .....	128

## Unit 4

### Addition, Subtraction & Measurement

Work Place Instructions 4A Target One Thousand.....	129
Mixed Review .....	130
Round 'Em Up! .....	131
The Dodgers & The Yankees.....	132
Rounding to the Nearest Thousand .....	133
Work Place Instructions 4B Add, Round & Compare....	134
Adding Larger Numbers .....	135
Addition Practice.....	136
Inventions .....	137
Music Academy.....	138
How Old?.....	139
Sam's Subtraction Strategies.....	141
Rolling Dice .....	142
More Practice with the Subtraction Algorithm.....	143
Using Subtraction Strategies.....	144
Work Place Instructions 4C Roll & Subtract One Thousand .....	145
Helpful Hints .....	146
Rounded Measures .....	147
Which Race Was Run?.....	148
Work Place Instructions 4D Target Five .....	149
Running Longer Distances.....	150
World Records.....	151
Preparing to Race.....	152
Drinks for Runners.....	153
Liquid Intake .....	154
Fueling Up .....	155
More Food .....	156
Hand Spans .....	157
Arm Spans.....	158
Butterfly Wingspans .....	159
Arm Spans Line Plot.....	160
Median, Mode & Range .....	161
Marble Roll.....	162

## Unit 5 Geometry & Measurement

Elena's Trip.....	163
Which Angle Doesn't Belong? .....	164
Pattern Block Angles .....	165
Right, Acute & Obtuse Angles.....	166
Measuring Pattern Block Angles.....	167
Using Pattern Blocks to Measure Angles on a Clock Face .....	168
Measuring Interior Angles of Polygons .....	170
Work Place Instructions 5A Angle Puzzles .....	171
Angles in Polygons.....	172
Thinking About Circles page 1 of 2.....	173
Finding Perimeters of Quadrilaterals .....	175
Experimenting with Angle Measurement.....	176
Measuring & Constructing Angles .....	178
Dots & Lines Game Record Sheet .....	179
Lines & Designs.....	180
Thinking About Lines .....	181
Thinking About Triangles .....	183
Thinking About Line Symmetry .....	184
Work Place Instructions 5B Mosaic Game .....	185
Pattern Block Symmetries .....	186
Naming Polygons .....	187
Drawing Shapes .....	188
Work Place Instructions 5C Solving Polygon Riddles...	189
Drawing Lines of Symmetry .....	190
Work Place Instructions 5D Polygon Bingo .....	191
Classifying Triangles & Quadrilaterals.....	192
Measuring Area.....	193
Area Problems.....	194
Measuring Perimeter .....	195
Thinking About Area .....	196
Area & Perimeter Formulas .....	197
Area & Perimeter Problems.....	199
Finding the Area & Perimeter of Complex Figures .....	200
Measuring the Range of Motion of Your Joints.....	201
Drawing Angles of Rotation .....	203
Geometry Measurement Problems .....	204
Turns & Fractions at the Skate Park .....	207
Mystery Angles.....	208
Shapes & Angles.....	209

## Unit 6 Multiplication & Division, Data & Fractions

Quimby's Quadrilaterals.....	210
Money Story Problems .....	211
Find or Write the Matching Equation.....	213
Jeremy's Birthday.....	214
More Multiplication Strategies .....	215
Multiplication Strategies .....	216
Zinnia's Garden .....	217
More Sports Challenges.....	218
More Multiplication Strings .....	220
The Slug's Lettuce Garden.....	221
Baking Fun.....	223
Area Challenges.....	224
Quinn's Quilt .....	226
String Rectangles.....	227
Kaylee's Kilometers .....	228
Work Place Instructions 6A Factors & Multiples.....	229
Perimeter Problems .....	230
Finding Factors & Multiples .....	232
Work Place Instructions 6B Area or Perimeter .....	233
Area & Perimeter Challenges.....	234
Frederico's Fort .....	235
Swimming Pool Times .....	236
Factors & Multiples Moves.....	238
The Swimming Contest .....	239
Snail Race .....	240
Work Place Instructions 6C Fraction Spin & Add .....	241
Playing Fraction Spin & Add .....	242
Present Purchase.....	243
Fraction Review .....	245
Splitting the Cost .....	246
Work Place Instructions 6D Lowest Remainder Wins....	247
David Goes Shopping .....	248
School Carnival .....	249
Remainder Review.....	250
Tessa's Tickets.....	251

## Unit 7

### Reviewing & Extending Fractions, Decimals & Multi-Digit Multiplication

Multiplication Review.....	252
Fraction Mixer Card.....	253
Shading & Comparing Fractions.....	254
Lining Up Fractions.....	255
Shading & Comparing Fractions Using Half.....	256
Equivalent Fraction Fill Record Sheets.....	257
Equivalent Fraction Fill Experimentation Sheet.....	259
Comparing Fractions.....	260
Comparing Fractions with a Number Line.....	261
Shade & Describe Equivalent Fractions.....	262
Comparing Fractions in Context.....	263
Comparing Fractions with Different Denominators....	265
Comparing Fractions at the Wild Animal Park.....	266
Shade & Describe More Equivalent Fractions.....	267
Decimal Fractions & Numbers.....	268
Scout the Marker Instructions.....	269
Scout the Marker Record Sheet	
Decimal Fractions Game.....	270
Decimal Fractions on Line & Grid.....	271
Scout the Marker Record Sheet	
Decimal Numbers Game.....	272
Writing & Comparing Decimal Numbers.....	273
Adding Decimal Fractions.....	274
Snail & Caterpillar Race to $\frac{300}{100}$ Instructions.....	275
Snail & Caterpillar Race to $\frac{300}{100}$ Record Sheets.....	276
Decimal Review.....	278
Multiplication Story Problems Record Sheet.....	279
Single-Digit Multiplication.....	280
Double-Digit by Single-Digit Multiplication.....	281
Roll Your Own Multiplication Problems.....	282
Practice with the Standard Algorithm.....	283
Multiplication Methods.....	284
Two Different Multiplication Methods.....	286
Double-Digit Multiplication Sketches.....	287
Multiples of Ten & More.....	289
Double-Digit Multiplication.....	290
Four Partial Products Practice.....	292
Two-Part Multiplication.....	293
Reasonable Estimates & Partial Products.....	295
Roll Your Own Double-Digit Multiplication Problems....	296
School Supplies.....	297
Reviewing Multiplication Methods.....	298
Evaluating Multiplication Methods.....	299
Addition & Subtraction Review.....	301
Secret Paths & Multiplication Tables.....	302

## Unit 8

### Playground Design

Playground Safety.....	303
Grassy Field.....	304
Grass Data Log.....	306
Our Grassy Field.....	307
Fulcrum Investigation.....	308
Scale Diagram.....	310
Twelve-Foot Seesaw.....	312
Pendulum Swing.....	313
Pendulum Graphing.....	316
Another Pendulum Swing Experiment.....	317
Slide Experiment.....	318
Two More Slides.....	320
Merry-Go-Round Bars.....	322
Preschoolers' Merry-Go-Round.....	324
The Current Playground.....	325
Measuring the Playground.....	326
Growing Grass.....	328
Ranking by Another Class.....	329
Playground Costs.....	330
Analyzing the Playground Costs.....	331
Estimate & Reason with Jam.....	332
Analyzing the Results.....	333
More Growing Grass.....	334
Planning Their Playground.....	335
Scaled Dimensions.....	336
Scale Factors.....	337
Ever-Growing Grass.....	338
Water Graph.....	339
Field Data.....	340
Field Measurements.....	341
New Field Costs.....	342
Another New Playing Field.....	344
Playground Model.....	345
Side-View Drawing.....	346
How Much Time Do They Need?.....	347

NAME \_\_\_\_\_

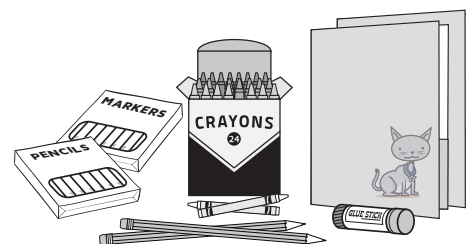
DATE \_\_\_\_\_



## More School Supplies

Help Mrs. Carter's students figure out how many of each supply they have. For each problem, show your thinking with numbers, sketches, or words. Then write an equation that represents your work.

- 1** The 4 students at table G each brought in 6 pencils.  
How many pencils are at table G?




---

 Equation

---

 Answer, labeled with correct units

- 2** The 4 students at table E each brought in a box of 12 crayons. How many crayons are at table E?

---

 Equation

---

 Answer, labeled with correct units

- 3** The 4 students at table B and the 4 students at table D each brought in 12 pens. How many pens do tables B and D have in all?

---

 Equation

---

 Answer, labeled with correct units

- 4** **CHALLENGE** The students at table C brought in a total of twice as many pens as the students at tables B and D put together. How many pens did the students at table C bring?

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## How Many Pencils?

Not all of Mrs. Carter's students brought in the same number of pencils to use for the school year. Help the students figure out how many pencils the class has. For each problem, show your thinking with numbers, sketches, or words. Then write an equation that represents your work.

- 1** Seven students brought in 6 pencils each. How many pencils did they bring in all?

---

 Equation

---

 Answer, labeled with correct units

- 2** Eight students each brought in 9 pencils. How many pencils did they bring in all?

---

 Equation

---

 Answer, labeled with correct units

- 3** Six students brought in 12 pencils each. How many pencils did they bring in all?

---

 Equation

---

 Answer, labeled with correct units

- 4** How many pencils did the students in problems 1, 2, and 3 bring in all together?

---

 Equation

---

 Answer, labeled with correct units

- 5** Fill in the blanks.

$7 \times 8 = \underline{\quad}$

$7 \times \underline{\quad} = 63$

$\underline{\quad} = 4 \times 8$

$\underline{\quad} \times 6 = 30$



NAME \_\_\_\_\_

DATE \_\_\_\_\_



## How Many Pens?

All of the students in Mrs. Carter's class brought in packs of pens, but the packs do not all have the same number of pens. Help Mrs. Carter figure out how many pens the class has. For each problem, show your thinking with numbers, sketches, or words. Then write an equation that represents your work.

- 1** Four students brought packs of pens with 3 pens in each pack. How many pens in all did these students bring to class?

---

Equation

---

Answer, labeled with correct units

- 2** Four students brought packs of pens with 4 pens in each pack. How many pens in all did these students bring to class?

---

Equation

---

Answer, labeled with correct units

- 3** Four students brought packs of pens with 7 pens in each pack. How many pens in all did these students bring to class?

---

Equation

---

Answer, labeled with correct units

- 4** **CHALLENGE** Four students brought packs with *3 times as many* pens as the students in problem 2. How many pens did these students give to the collection of class supplies?

---

Equation

---

Answer, labeled with correct units

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## How Many Erasers?

Mrs. Carter's fourth grade students brought lots of erasers to use for the school year. Help the students figure out how many erasers they have. For each problem, show your thinking with numbers, sketches, or words. Then write an equation that represents your work.

- 1** Four students each brought 5 erasers. How many erasers did these 4 students bring?

---

 Equation

---

 Answer, labeled with correct units

- 2** Four students each brought 6 erasers. How many erasers did these 4 students bring?

---

 Equation

---

 Answer, labeled with correct units

- 3** Eight students each brought 5 erasers. How many erasers did these 8 students bring?

---

 Equation

---

 Answer, labeled with correct units

- 4 CHALLENGE** Eight students each brought twice as many erasers as the students in problem 3. How many erasers did these 8 students bring?

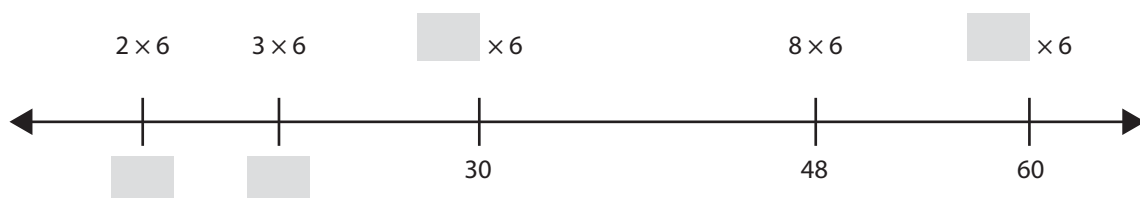
---

 Equation

---

 Answer, labeled with correct units

- 5** Fill in the blanks in the number line puzzle below.



NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Claudia's School Supplies

Solve each problem below. Use numbers, sketches, or words to show your work.

- 1** Claudia bought school supplies in August. She bought 4 packages of pencils. Each package had 12 pencils in it. How many pencils did Claudia buy?

---

 Equation

---

 Answer, labeled with correct units

- 2** Claudia bought 8 packages of pens. Each package had 6 pens in it. How many pens did Claudia buy?

---

 Equation

---

 Answer, labeled with correct units

- 3** Claudia bought extra packages of crayons. Each package had 8 crayons in it. Fill out the ratio table below to find out more about how many crayons Claudia bought.

Packages	Crayons
1	8
2	
4	
8	
	80
5	
15	

- 4** While Claudia was at the store, she saw a box of crayons that had 8 times the number of crayons as the little boxes she bought to bring to class. How many crayons were in the box?

---

 Equation

---

 Answer, labeled with correct units



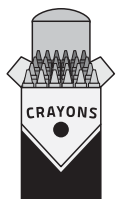
NAME \_\_\_\_\_

DATE \_\_\_\_\_

# More Crayons

**1** Each of the models below represents a student’s strategy for finding the number of crayons in a box.

**a** The first box has 4 rows of 6 crayons. How many crayons are there? Show your thinking and write an equation to show your answer.



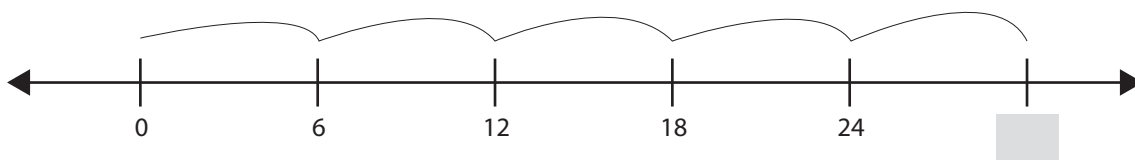
\_\_\_\_\_

**b** The second box has 6 rows of crayons. How many crayons are there? Complete the ratio table and write an equation to show your answer.

Rows of Crayons	Number of Crayons
1	6
2	12
3	18
6	

\_\_\_\_\_

**c** The third box has 5 rows of crayons. How many crayons are there? Fill in the blank and write an equation.



**2** Mark has twice as many crayons as the box modeled on the number line in the problem above. Write an equation to show how many crayons Mark has.

\_\_\_\_\_

**3** Fill in the blanks:

$$\begin{array}{r} 10 \\ + 450 \\ \hline \square \end{array}$$

$$\begin{array}{r} 89 \\ - \square \\ \hline 80 \end{array}$$

$$\begin{array}{r} 29 \\ + \square \\ \hline 29 \end{array}$$

$$\begin{array}{r} 100 \\ - 25 \\ \hline \square \end{array}$$

$$\begin{array}{r} \square \\ - 10 \\ \hline 459 \end{array}$$

$$\begin{array}{r} 900 \\ - 500 \\ \hline \square \end{array}$$

$$\begin{array}{r} 200 \\ + \square \\ \hline 400 \end{array}$$



NAME \_\_\_\_\_

DATE \_\_\_\_\_

 **Camping Story Problems** page 1 of 2

Model each problem with a labeled sketch of an open number line, a ratio table, or an array. Then, write an equation to show your answer.

- 1** At Camp Mosquito, there are 24 campers and 6 tents. If each tent has the same number of campers, how many campers are in each tent?



- 2** During dinner at Camp Mosquito, 6 campers can sit at each table. How many tables are needed for 24 campers?

- 3** Tennis balls come 3 to a can. Coach Brammer has 27 tennis balls. How many cans does she have?



- 4** The campers are getting ready for lunch. There are 8 groups of campers and 56 brownies. How many brownies will each group get if they share evenly?

- 5** If 8 glasses can be filled from one carton of orange juice, how many glasses can be filled from 7 cartons?



*(continued on next page)*

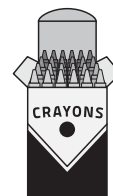
NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Camping Story Problems** page 2 of 2

If you have time, choose some of the problems below to solve.

- 6** Rico gave his sister 6 boxes of crayons. She was thrilled to get 48 new crayons. How many crayons were in each box if each box had the same number of crayons?



- 7** There are 36 kids in the class. They need to make 4 equal teams. How many kids will be on each team?

- 8** **CHALLENGE** It's time for a picnic! There are 8 hot dog buns in a package. Sixteen people are coming to the picnic, and you know each person is going to be hungry enough to eat 2 hot dogs. How many packages of hot dog buns should you buy?



- 9** **CHALLENGE** Sports equipment bags that usually cost \$9.97 each are on sale for \$7.97 each. If the coach buys 9 bags on sale, how much money does she save?

- 10** **CHALLENGE** Colorful binders that usually cost \$4.49 are on sale for \$2.99 each. How much money will you save if you buy 8 binders at the sale price?





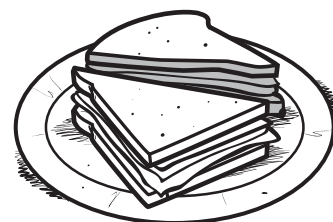
NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Sandwiches & Pizza

- 1** Rodney had a friend over on Saturday. His dad took them out for sandwiches. Rodney's dad and the boys each got a sandwich for \$6 and a drink for \$2. They shared one large cookie that cost \$3. How much did they spend in all?



- 2** Jasmine had a pizza party with 3 of her friends. They ordered 2 pizzas. Each pizza had 8 slices. They all ate the same amount of pizza and finished both pizzas. How many did each person eat? Show all your work.



- 3** Complete the equations.

$$\begin{array}{r} 1 \\ \times 8 \\ \hline \square \end{array}$$

$$\begin{array}{r} 73 \\ \times \square \\ \hline 0 \end{array}$$

$$\begin{array}{r} \square \\ \times 2 \\ \hline 20 \end{array}$$

$$\begin{array}{r} \square \\ \times 10 \\ \hline 60 \end{array}$$

$$\begin{array}{r} 10 \\ \times 3 \\ \hline \square \end{array}$$

$$\begin{array}{r} 49 \\ \times \square \\ \hline 49 \end{array}$$

$$\begin{array}{r} 7 \\ \times 8 \\ \hline \square \end{array}$$

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Division Models page 1 of 2

**1** Each table of 4 students in Mrs Thornton's class brought 9 glue sticks.

**a** Fill in the blanks in the ratio table.

<b>Number of Tables</b>	1	2			9	5
<b>Number of Glue Sticks</b>	9		27	90		

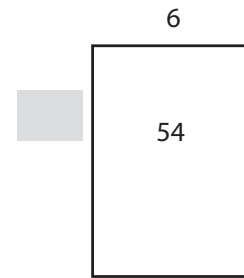
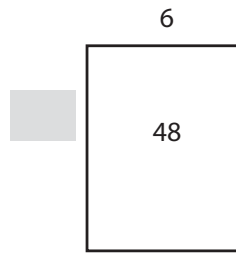
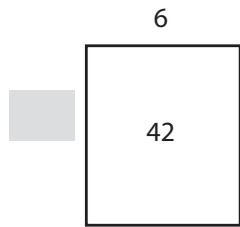
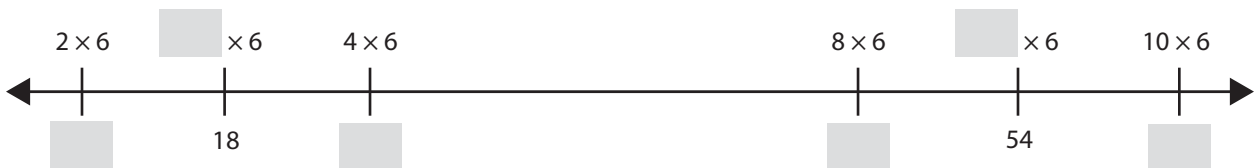
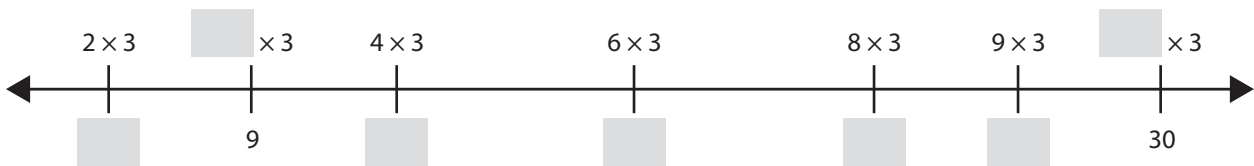
**b** Write a story problem that matches one of the entries in the glue stick ratio table.

**c** One of the tables in Mr. Still's class brought in 3 times as many glue sticks as one of the tables in Mrs. Thornton's class. How many glue sticks did that table group in Mr. Still's class bring? Write and solve an equation to show.

*(continued on next page)*

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Division Models** page 2 of 2**2** Fill in the missing dimensions in the arrays.**3** Write at least two equations to match one of the arrays in problem 2.**4** Fill in the blanks on the number lines.**5** Fill in the blanks to make the equations true.

$$10 \times 4 = 5 \times \underline{\quad\quad} \quad 10 \times 3 = 5 \times \underline{\quad\quad} \quad 10 \times 5 = 5 \times \underline{\quad\quad} \quad 10 \times 2 = 5 \times \underline{\quad\quad}$$

$$10 \times 10 = 5 \times \underline{\quad\quad} \quad 5 \times 8 = 10 \times \underline{\quad\quad} \quad 5 \times 4 = 10 \times \underline{\quad\quad}$$



## Arranging School Supplies

Mrs. Carter is organizing some of her school supplies that came in square boxes. She is trying to figure out the best way to arrange them. She knows she wants everything to be arranged in a single layer as a rectangle, but she is not sure how to arrange the boxes to make the rectangles. Can you help Mrs. Carter? Solve each problem below. Show your work using numbers, sketches, or words.

- 1** Mrs. Carter has 18 square boxes of tacks.
  - a** How many different rectangles can she make with the 18 boxes of tacks? What are the dimensions of each of the different rectangles?
  
  
  
  
  
  
  
  
  
  
  - b** How do you know that you found all of the possible rectangles?
  
- 2** Mrs. Carter has 24 square boxes of paperclips. How many different rectangles can she make with the 24 boxes of paperclips? What are the dimensions of each of the different rectangles?
  - a** Mrs. Carter is out of storage space, so she is going to keep her paperclip boxes on the windowsill. What are the dimensions of the rectangle you think Mrs. Carter should use? Explain your thinking.



NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Recording Factors

- 1** Start by filling in the row for 12. Then write the products from the posters you talked about today in your group in the *Number* column and fill out the rows for those numbers.

Number	Number of Rectangles	Dimensions of Rectangles	Factors of the Numbers	Prime (P) or Composite (C) Number
12				

- 2** Why are some numbers prime and some numbers composite?

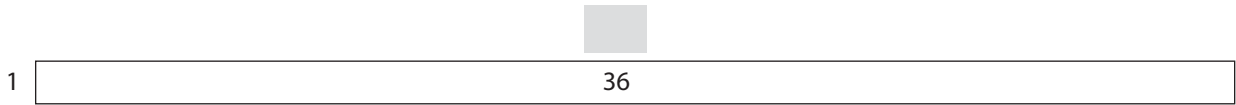
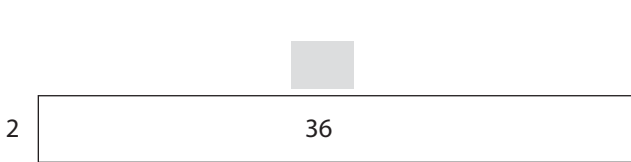
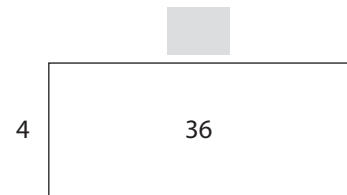
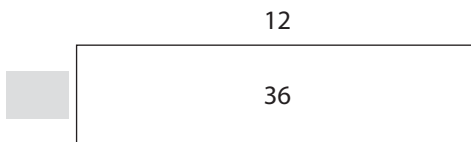
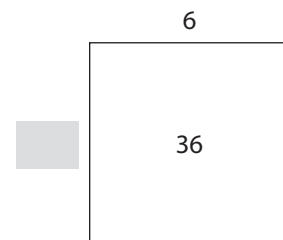
NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Factors of 36

Use 36 tiles to build each rectangle below. After you build each rectangle, lay red linear pieces along the left side and the top. Then write in the missing dimensions on the sketches below.

**1****2****3****4****5**

**6** The factors of 36 are:

1 and \_\_\_\_\_, 2 and \_\_\_\_\_, 4 and \_\_\_\_\_, \_\_\_\_\_ and 12, \_\_\_\_\_ and 6

**7** Is 36 a *prime* or a *composite* number?

**a** How do you know?

**8** Study the list of factors of 36. What patterns do you observe?

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Multiplication Table

×	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100





# Work Place Instructions 1A Cover Up

## Each pair of players needs:

- a 1A Cover Up Record Sheet to share
- 2 spinner overlays
- 4 crayons or colored pencils in different colors
- 1 black crayon or colored pencil

- 1 Players record their names in the spaces provided on a record sheet.
- 2 Players take turns spinning the spinners and coloring in arrays with those dimensions. On each turn, players use a black crayon or colored pencil to label the area of the array. Players talk to their partner about how they found the area.
- 3 Players will each get 4 turns. Players should use a different color for each array.
- 4 If a player spins dimensions for an array that will not fit, the player loses that turn unless he can find room to draw two smaller arrays that add up to the area of the array that was spun. The two smaller arrays must both use one of the dimensions spun on that turn.
- 5 After players have both had 4 turns, they determine who got closer to 100 and by how much. They record this information on the record sheet.
- 6 If players would like to play again, they can get another Cover Up Record Sheet.

Unit 1 Module 2 | Session 3 2 class sets, plus more as needed, stored in the Work Place tray

NAME \_\_\_\_\_ DATE \_\_\_\_\_

**1A Cover Up Record Sheet**

Player 1 Sam Player 2 Jamie

3 × 4 = 12

×

Player 1's total

Player 2's total

Who won? \_\_\_\_\_

How close was the winner to 100? \_\_\_\_\_

How many more points did the winner have than the other player? \_\_\_\_\_

Teacher Master — Bridges in Mathematics Grade 4 15 © The Math Learning Center — www.gotomk.org

## Game Variations

- A Players can spin each spinner 5 times and see if they can fit the 5th array in the grid.
- B Players can spin each spinner 5 or more times all at once and then select dimensions for 4 arrays to fit into the grid.
- C If players are having a hard time fitting 4 arrays in the grid, they can play a few games in which they only spin 3 times.
- D Players can play the game with a partner, rather than against a partner, to see how close they can get to 100 working together.



## Class Quilt

Mr. Carpenter's 28 students are making a paper quilt. Each student decorated a square piece of paper. Now, Mr. Carpenter has to decide how to arrange the 28 squares. Help him find the best way to arrange the quilt squares.

- 1 How many different ways can Mr. Carpenter arrange the 28 squares? (How many arrays can he make using 28 squares?) Draw the arrangements and label them with their factors.
- 2 Which arrangement do you think Mr. Carpenter should choose? Why?
- 3 A new student joins Mr. Carpenter's class. Now he has 29 quilt squares to arrange. How many arrays can he make with 29 quilt squares? Draw the arrays and label them with their factors.
- 4 **CHALLENGE** Do you think Mr. Carpenter should use a rectangle to arrange the 29 quilt squares? If not, what shape should he use? Explain your thinking.



## Work Place Instructions 1B Arrays to One Hundred

### Each pair of players needs:

- 2 1B Arrays to One Hundred Record Sheets for each player
- 2 dice numbered 1–6
- 1 die numbered 4–9
- crayons or felt-tip pens and 2 pencils

- 1 The object of the game is to fill in as much of the grid as possible without going over 100. Students will fill in their own record sheets.
- 2 The first player rolls any two dice and uses a crayon or colored pen to quickly sketch in an array with those dimensions. If a 1 is rolled, the player can roll again to try to get a bigger number.
- 3 In the box below the grid, the player writes an equation that describes the array.
- 4 The player's partner must agree that the correct product has been shaded in. If it is incorrect, the player must fix it. Partners fill in the grids for each other on their own record sheets.
- 5 Players take turns rolling any two dice and use a different color pen or crayon to sketch each array.
- 6 As players' grids fill up, they might roll an array that won't fit in one place. Arrays can be broken into smaller arrays. The written equation must show how the player combined smaller arrays to get the product of the numbers rolled.

Unit 1 Module 2 | Session 4 2 class sets, plus more as needed, stored in the Work Place tray

NAME Cheyenne | DATE \_\_\_\_\_

**1B Arrays to One Hundred Record Sheet**

Player 1 Cheyenne | Player 2 Adam

**Game 1**

$3 \times 7 = 21$ $5 \times 8 = 40$ $4 \times 8 =$ $(2 \times 8) + (2 \times 8) = 32$	$5 \times 8 = 40$ $2 \times 8 = 16$ $3 \times 5 = 15$

Cheyenne rolled  $4 \times 8$ . It would not fit in her grid, so she broke the array into two smaller arrays:  $(2 \times 8) + (2 \times 8)$ .

- 7 If a player rolls an array that can't fit in his grid, even if it is broken into smaller arrays, that turn is lost.
- 8 When one player gets close to filling in the entire grid, she can choose to stop rolling the dice. The other player can continue rolling until he wants to stop.
- 9 The game is over when both players have decided to stop rolling.
- 10 The player who gets closest to filling in all 100 squares wins the game. Circle the winner on each record sheet.

### Game Variation

Partners choose the dice for each other.



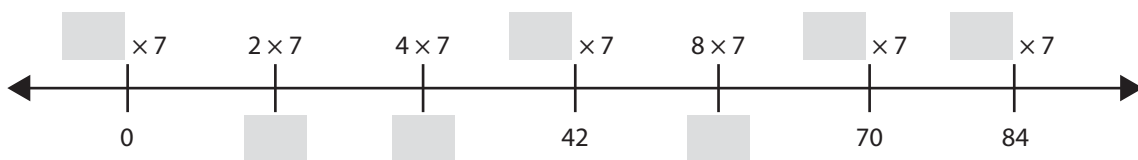
## Seashells

Claudia loves to collect shells at the beach. She has a large collection of shells. Today, Claudia is organizing her shells. Write and solve an equation for each problem below.

- 1 Claudia made 4 groups with 6 small shells in each group. How many small shells did she use?
  
- 2 Claudia made 8 groups with 6 medium-size shells in each group. How many medium sized shells did she use?
  
- 3 Claudia made 9 groups with 6 large shells in each group. How many large shells did she use?
  
- 4 **CHALLENGE** Claudia had lots of tiny shells. She made three times as many groups of tiny shells as groups of large shells.
  - a How many groups of tiny shells did she make?
  
  - b If she put 6 tiny shells in each group, how many tiny shells did she use?

## Number Line Puzzle

- 5 Solve the number line puzzle below:



NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Multiplying by 4 & 6

- Circle all the Double-Doubles facts ( $\times 4$ ) in blue. Then solve them and use a regular pencil to write each product.
- Circle all the Half-Tens Plus One Set facts ( $\times 6$ ) in red. Then solve them and use a regular pencil to write each product.

$$\begin{array}{r} 6 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 7 \\ \hline \end{array}$$

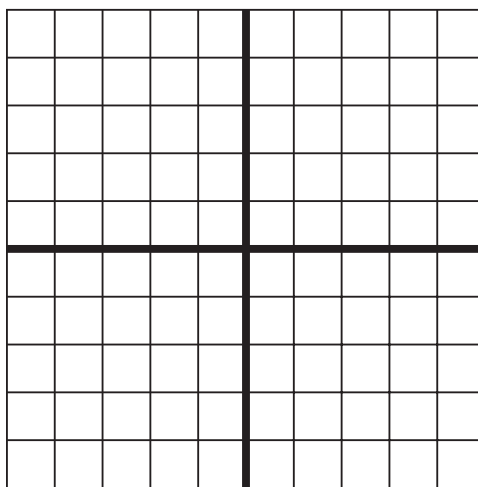
$$\begin{array}{r} 4 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 6 \\ \hline \end{array}$$

- Choose one fact from problem 2 and complete the following steps.
  - Write the fact you chose here: \_\_\_\_\_
  - Color in the array for that fact on the grid below.
  - Label the array to show how you found the product, and use equations or words to explain your work.





## Work Place Instructions 1C The Multiple Wheel

### Each pair of players needs:

- a 1C Multiple Wheel Record Sheet to share
- 2 dice numbered 1–6
- 2 pencils

- 1** One player rolls the dice, adds the two numbers, and writes the sum of the numbers in the center of the wheel.
- 2** Players work together to multiply the number in the center of the wheel times each of the numbers in the middle ring and then write the products in the outside ring.
- 3** Players take turns recording an equation for each fact in the record sheet chart.
- 4** Players talk about strategies as they multiply each pair of factors. For example, when multiplying by 9, you can use the Ten Minus One Set strategy.  
*Student 1 Nines are really hard.*  
*Student 2 I know, but look, we did 10 times 8 already. If we just take away an 8, then we'll find 9 times 8.*
- 5** When the multiple wheel and chart have been completed, partners discuss and answer the reflection question at the bottom of the record sheet.

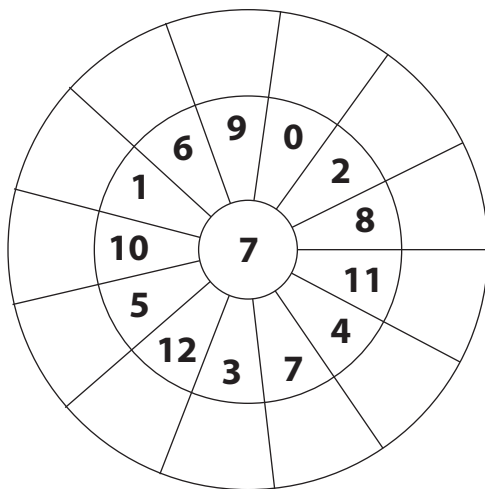
### Game Variation

Make the game competitive by playing against each other. Roll for the center number and put that number in the middle of the wheel on two separate record sheets. Then see who can complete the wheel faster.



## The Multiple Wheel

- 1 Fill in the spaces in the multiple wheel.



- 2 How did you decide which problems to solve first? Did you use any particular order to solve the problems on the wheel? Explain your thinking.

- 3 Solve the equations below:

$2 \times \underline{\quad} = 18$

$\underline{\quad} \times 9 = 36$

$\underline{\quad} = 6 \times 9$

$\underline{\quad} \times 8 = 16$

$4 \times \underline{\quad} = 32$

$8 \times 8 = \underline{\quad}$

$3 \times 7 = \underline{\quad}$

$5 \times \underline{\quad} = 35$

- 4 Is the number 39 prime or composite? Explain your thinking.



## Work Place Instructions 1D Spinning Around Multiplication

### Each pair of players needs:

- 2 1D Spinning Around Multiplication Record Sheets
- 1 spinner overlay
- 2 pencils

- 1 Players take turns spinning over each number circle. On each turn, the player decides what kind of fact was spun. If a fact fits in two categories, only one category is chosen.
- 2 Each player writes an equation with the factors and their product in the chosen category.

Me					$8 \times 9 = 72$
My Partner					
	Double - Doubles facts	Half - Tens facts	Half - Tens Plus One Set facts	Double - Double - Doubles facts	Tens Minus One Set facts

*I spun 8 and then 9. It could be Double-Double-Doubles or Tens Minus One Set. Tens Minus One Set is easier for me, though, so I wrote the equation in the last column.*

- 3 Players record both their own and their partner's equations on their record sheet.
- 4 The game ends when one player has at least one equation in each column. Players may have more than one fact in some columns before recording a fact in every column. If the player who took the first turn is the first to get an equation in each column, the other player may take one more turn.

### Game Variations

- A Play continues until one player gets at least two facts in every box.
- B Players multiply by each number in one of the number circles by 10, then play as described above. They notice which columns fill and consider whether there are any columns that never get filled.
- C During the game, players consider the probability of being able to fill in each column—which are most likely to be filled in?





## Games Problems

- 1** Rosa and Jami are playing Spinning Around Multiplication. Rosa spun a 7 and an 8.
- a** What is  $7 \times 8$ ?
  - b** What type of fact did Rosa spin?
- 2** Jami spun a 6 and a 9.
- a** What is  $6 \times 9$ ?
  - b** What type of fact did Jami spin?
- 3** Carlos and Eli are doing the Multiple Wheel activity. Eli says he can use the fact  $3 \times 6$  to solve  $6 \times 6$ . Do you agree or disagree? Explain your thinking.
- 4** Carlos says he can use the fact  $6 \times 8$  to help him solve  $6 \times 7$  and  $6 \times 9$ . Do you agree or disagree? Explain your thinking.
- 5** Fill in the ratio table below. Then, circle any numbers in the table that are prime.

1	5
2	
	15
6	
7	35
	40



# Work Place Instructions 1E Products Four in a Row

## Each pair of players needs:

- a 1E Products Four in a Row Record Sheet to share
- 2 game markers of the same color to share
- 2 pencils

- 1 Players decide who is going first and who will be X or O.
- 2 The circled numbers along the left side of the record sheet are factors. Player 1 places a game marker on one of the factors.
- 3 Player 2 chooses a second factor by placing the other game marker on a factor. Player 2 draws an X on the product of that factor pair and writes the matching equation in her column of the record sheet.

*Player 1* I choose 5 and O's.

*Player 2* I choose 7 and X's. So I will draw an X on 35 because  $5 \times 7$  is 35.

		25	27	28	30	32	<del>35</del>
	4	36	40	42	45	48	49
	5	54	56	63	64	72	81
	6	Player 1			Player 2		
	7				$5 \times 7 = 35$		

- 4 Player 1 moves one factor marker to get a new product.

*Player 1* I'm moving the factor marker from the 7 to the 4. Since  $4 \times 5$  is 20, I put an O on 20.

		15	16	18	20	21	24
	3	25	27	28	30	32	<del>35</del>
	4	36	40	42	45	48	49
	5	54	56	63	64	72	81
	6	Player 1			Player 2		
		$4 \times 5 = 20$			$5 \times 7 = 35$		

- 5 Play continues until a player gets four products in a row, across, up and down, or diagonally.
- 6 Only one of the game markers can be moved during a turn. After choosing a new factor, if the product of the two factors is already marked by an O or an X, the player loses that turn.
- 7 A marker can be moved so that both markers are on the same factor. For example, if both markers are on 3, the player would mark the product 9 because  $3 \times 3 = 9$ .

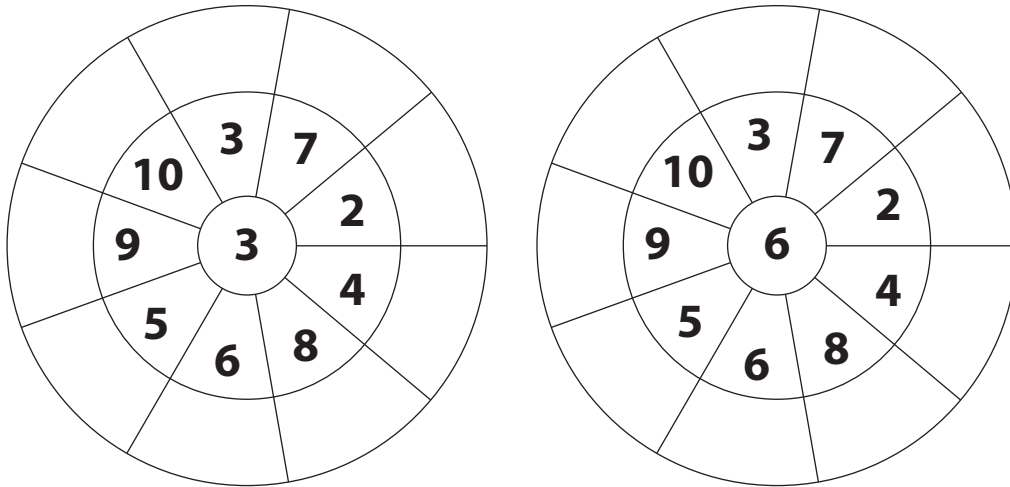
## Game Variations

- A If the player makes a product that is already covered, she can try again.
- B Players use the 1E Products Four in a Row Record Sheet, Variation to play with a game board with fewer factors and fewer products.



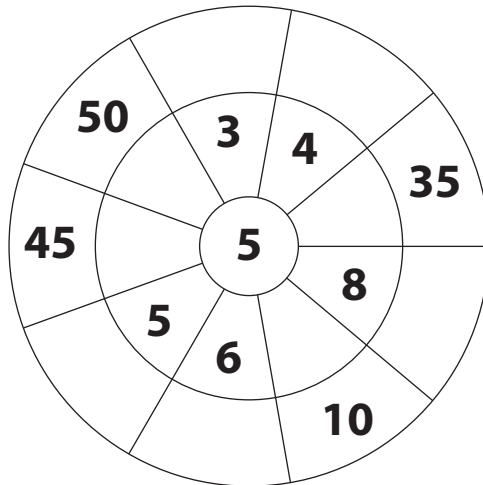
## Product Wheels

1 Fill in the outer rings for each product wheel.



2 Compare the two product wheels for 3 and 6 above. What pattern do you notice?

3 Fill in the empty sections of the product wheel below.



4 Circle the prime numbers in the product wheel for problem 3.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Multiplication & Division Facts

**1** Solve the problems below.

$$\begin{array}{r} 8 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \times 1 \\ \hline \end{array}$$

$$\begin{array}{r} 1 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 10 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 8 \\ \hline \end{array}$$

$63 \div 7 = \underline{\quad\quad\quad}$

$42 \div 7 = \underline{\quad\quad\quad}$

$36 \div 4 = \underline{\quad\quad\quad}$

$20 \div 5 = \underline{\quad\quad\quad}$

$16 \div 8 = \underline{\quad\quad\quad}$

$18 \div 3 = \underline{\quad\quad\quad}$

$6 \div 3 = \underline{\quad\quad\quad}$

$14 \div 2 = \underline{\quad\quad\quad}$

**2** Circle all the prime numbers in problem 1 (including your answers).

**3** Complete the equations.

$$\begin{array}{r} 6 \\ \times 3 \\ \hline \square \end{array}$$

$$\begin{array}{r} 4 \\ \times 5 \\ \hline \square \end{array}$$

$$\begin{array}{r} 5 \\ \times 7 \\ \hline \square \end{array}$$

$$\begin{array}{r} 8 \\ \times 4 \\ \hline \square \end{array}$$

$$\begin{array}{r} 8 \\ \times 8 \\ \hline \square \end{array}$$

$$\begin{array}{r} \square \\ \times \square \\ \hline 6 \end{array}$$

$$\begin{array}{r} \square \\ \times \square \\ \hline 10 \end{array}$$

$$\begin{array}{r} \square \\ \times 5 \\ \hline 15 \end{array}$$

$$\begin{array}{r} \square \\ \times 8 \\ \hline 40 \end{array}$$

$$\begin{array}{r} \square \\ \times \square \\ \hline 72 \end{array}$$

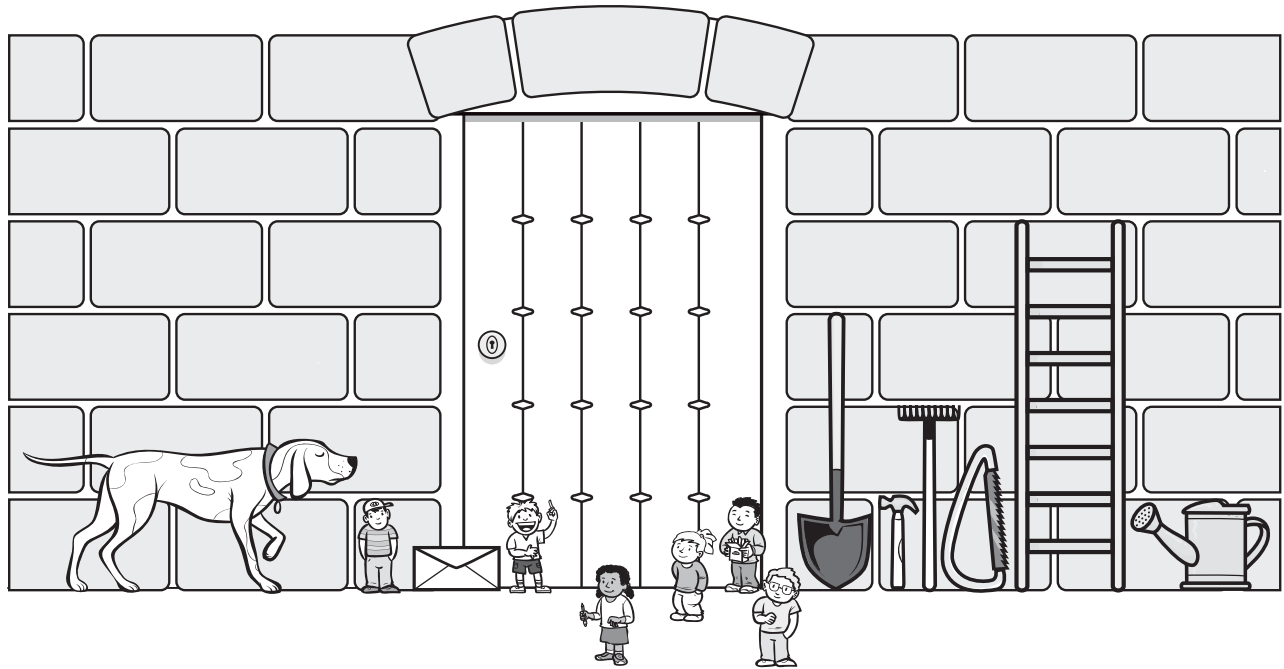
**4** How can you use the answer to  $4 \times 8$  to solve  $4 \times 16$ ? Draw an array and then use numbers or words to explain your answer.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## More Multiplicative Comparisons at the Giant's Door page 1 of 2



The giant's hammer is 48" tall. Use this information to solve the problems below. Show your work and write an equation to represent each situation.

- 1** The shovel is \_\_\_\_\_ times as tall as the hammer. The shovel is \_\_\_\_\_ inches tall.

\_\_\_\_\_ Equation

\_\_\_\_\_ Answer, labeled with correct units

- 2** The ladder is \_\_\_\_\_ times as tall as the hammer. The ladder is \_\_\_\_\_ inches tall.

\_\_\_\_\_ Equation

\_\_\_\_\_ Answer, labeled with correct units

- 3** The wooden door is \_\_\_\_\_ times as tall as the hammer. The door is \_\_\_\_\_ inches tall.

\_\_\_\_\_ Equation

\_\_\_\_\_ Answer, labeled with correct units

*(continued on next page)*

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**More Multiplicative Comparisons at the Giant's Door** page 2 of 2

- 4** The envelope is \_\_\_\_\_ as tall as the hammer. The envelope is \_\_\_\_\_ inches tall.

\_\_\_\_\_ Equation

\_\_\_\_\_ Answer, labeled with correct units

- 5 CHALLENGE** The dog is \_\_\_\_\_ times as tall the hammer. The dog is \_\_\_\_\_ inches tall.

\_\_\_\_\_ Equation

\_\_\_\_\_ Answer, labeled with correct units

- 6** Fill in the bubble beside the equation that best represents each situation below.  
(Note: The letter *i* stands for inches.)

- a** The hammer is 48 inches tall. The rake is 2 times as tall as the hammer. How tall is the rake?

$48 \div 2 = i$

$48 + 2 = i$

$48 \times 2 = i$

- b** The ladder is 192 inches tall. That is 4 times as tall as the watering can. How tall is the watering can?

$192 \div 4 = i$

$192 \times 4 = i$

$192 + 4 = i$

- 7** The saw is 72 inches tall. The envelope is 24 inches tall. How many times taller is the saw than the envelope? Show your work and write the answer on the line below.

The saw is \_\_\_\_\_ times as tall as the envelope.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Drawing Comparisons & Writing Equations

You will need a ruler marked in centimeters to do some of these problems.

- 1** In the space below, draw a horizontal line that is exactly 5 centimeters long. Below that line, draw another horizontal line that is exactly 3 times as long as the first. Write a multiplication equation that gives the length of each line and tells how many times longer the second line is than the first.

\_\_\_\_\_

My equation

- 2** Here are two lines. Use them to answer the questions below.

A \_\_\_\_\_

B \_\_\_\_\_

- a** If you just look at both lines, how many times as long is line B than line A? Make an estimate without measuring the lines.

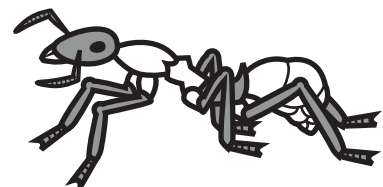
It looks like line B is \_\_\_\_\_ times as long as line A.

- b** Now measure and label both lines in centimeters. How many times as long is line B than line A? Write an equation to show.

\_\_\_\_\_

My equation

- 3** Adam Ant crawled 7 centimeters. Angela Ant crawled twice as far as Adam. Measure, draw, and label a line to show how far Angela Ant crawled.





## Work Place Instructions 1F Dragon's Gold

### Each pair of players needs:

- 1 1F Dragon's Gold Record Sheets (players need to agree on which version of the sheet they're going to use)
- 1 die to share, numbered 1–6 for use with Record Sheet A or numbered 4–9 for use with Record Sheet B
- 1 clear spinner overlay to share
- a regular pencil for each player

**1** The object of the game is to mark 5 boxes in a row, going horizontally, vertically, or diagonally. Players each fill in their own record sheet.

**2** The first player rolls the die and spins the spinner at the top of his record sheet, and then multiplies the number rolled by the number of times indicated on the spinner.

**3** The player then finds the product on his record sheet and records a statement of multiplicative comparison below the number, using an equation that starts with the product.


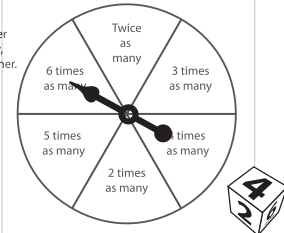
For example, if the player rolls a 4 and lands on *6 times as many* when he spins, he multiplies  $6 \times 4$  to get 24. Then he finds 24 on his record sheet and writes  $24 = 6 \times 4$  below the number to represent the fact that 24 is 6 times as many as 4.

Unit 1 Module 3 | Session 4 class set, plus more as needed, stored in the Work Place tray

NAME \_\_\_\_\_ DATE \_\_\_\_\_

### 1F Dragon's Gold Record Sheet A

Roll a 1–6.  
Then spin my spinner.  
If you're really lucky,  
I won't eat you for dinner.

10	6	18	5	24
				$24 = 6 \times 4$

**4** The second player takes her turn. Play continues until one of the players has written equations in 5 boxes in a row, horizontally, vertically, or diagonally.

- If a player rolls and spins a product that shows up more than once on the record sheet, he writes an equation in only one of the boxes, not both.
- Players should look for duplicate products on their record sheets, and choose carefully to increase their chances of marking 5 boxes in a row.
- If a player spins and rolls a product she has already marked on her sheet, and there is no duplicate, she can write the equation in the dragon's box at the center of the sheet. This is allowed once. After that, the player loses her turn and play goes to her partner.

**5** The game is over when one of the partners has written an equation in 5 boxes in a row, horizontally, vertically, or diagonally.

### Game Variation

**A** Partners use a die numbered 4–9 and 2 copies of the 1F Dragon's Gold Record Sheet B. The game is played the same way, but now students are working with multiplicative comparisons up to  $90 = 10 \times 9$ .





## More Multiplicative Comparisons

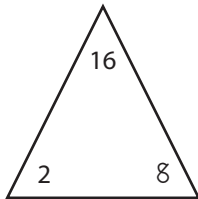
- 1** The equation  $45 = 5 \times 9$  can mean (fill in the bubble beside every true sentence):
- 45 is the same as 5 groups of 9
  - 45 is 5 times as many as 9
  - 45 is 5 less than 9
  - 45 is the same as 9 groups of 5
- 2** Fill in the bubbles beside the two equations that best represent this situation:  
Dante has 36 baseball cards. That is 4 times as many as his friend, Andrew, has.  
How many baseball cards does Andrew have? (In the equations below,  $b$  stands for Andrew's baseball cards.)
- $4 \times b = 36$         $36 \times 4 = b$         $36 + 4 = b$         $36 \div b = 4$
- 3** Write and solve an equation for each of these problems.
- a** Sara is 12 years old. Sara's mom is 3 times older than Sara. How old is Sara's mom?
- b** David bought a jacket and a T-shirt. The jacket cost 4 times as much as the T-shirt. The T-shirt cost \$20. How much did the jacket cost?
- c** Jenny bought a book and a DVD. The book cost \$21. That was 3 times more than the DVD. How much did the DVD cost?
- 4** **CHALLENGE** Daniel rode his bike 5 kilometers. His friend, Briana, rode 8 times as far. Her friend, Ted, rode half as far as Briana. How far did Ted ride? Show all your work.



# All in the Family

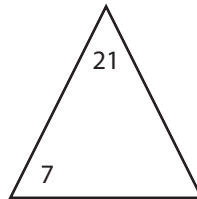
**1** Fill in the missing number in each triangle. Then write the facts in the fact family.

**ex**



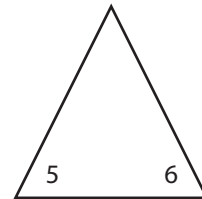
$$\begin{aligned} 2 \times 8 &= 16 \\ 8 \times 2 &= 16 \\ 16 \div 8 &= 2 \\ 16 \div 2 &= 8 \end{aligned}$$

**a**



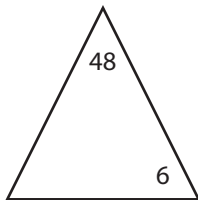
$$\begin{aligned} \_\_\_\_ \times \_\_\_\_ &= \_\_\_\_ \\ \_\_\_\_ \times \_\_\_\_ &= \_\_\_\_ \\ \_\_\_\_ \div \_\_\_\_ &= \_\_\_\_ \\ \_\_\_\_ \div \_\_\_\_ &= \_\_\_\_ \end{aligned}$$

**b**



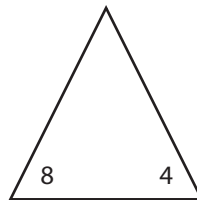
$$\begin{aligned} \_\_\_\_ \times \_\_\_\_ &= \_\_\_\_ \\ \_\_\_\_ \times \_\_\_\_ &= \_\_\_\_ \\ \_\_\_\_ \div \_\_\_\_ &= \_\_\_\_ \\ \_\_\_\_ \div \_\_\_\_ &= \_\_\_\_ \end{aligned}$$

**c**



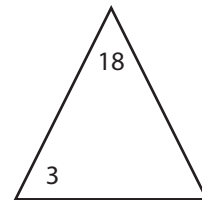
$$\begin{aligned} \_\_\_\_ \times \_\_\_\_ &= \_\_\_\_ \\ \_\_\_\_ \times \_\_\_\_ &= \_\_\_\_ \\ \_\_\_\_ \div \_\_\_\_ &= \_\_\_\_ \\ \_\_\_\_ \div \_\_\_\_ &= \_\_\_\_ \end{aligned}$$

**d**



$$\begin{aligned} \_\_\_\_ \times \_\_\_\_ &= \_\_\_\_ \\ \_\_\_\_ \times \_\_\_\_ &= \_\_\_\_ \\ \_\_\_\_ \div \_\_\_\_ &= \_\_\_\_ \\ \_\_\_\_ \div \_\_\_\_ &= \_\_\_\_ \end{aligned}$$

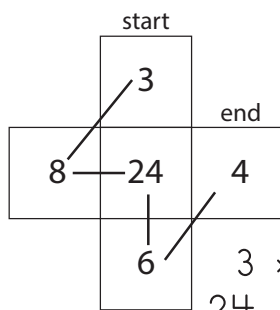
**e**



$$\begin{aligned} \_\_\_\_ \times \_\_\_\_ &= \_\_\_\_ \\ \_\_\_\_ \times \_\_\_\_ &= \_\_\_\_ \\ \_\_\_\_ \div \_\_\_\_ &= \_\_\_\_ \\ \_\_\_\_ \div \_\_\_\_ &= \_\_\_\_ \end{aligned}$$

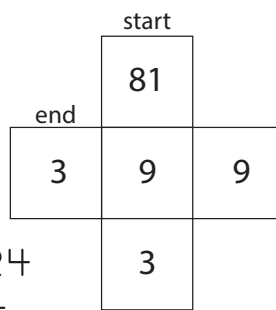
**2 CHALLENGE** Use multiplication and division to find the secret path through each maze. You can only move one space up, down, over, or diagonally each time. Write two equations to explain the path through the maze.

**ex**

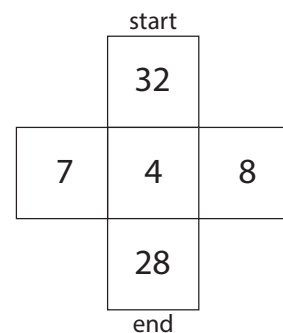


$$\begin{aligned} 3 \times 8 &= 24 \\ 24 \div 6 &= 4 \end{aligned}$$

**a**



**b**

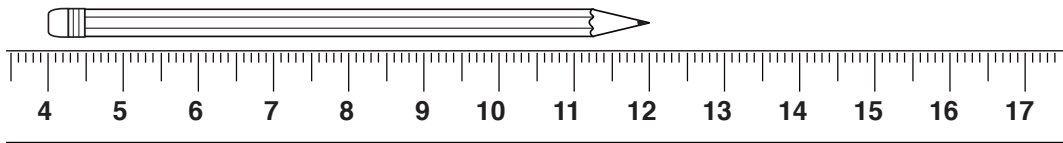
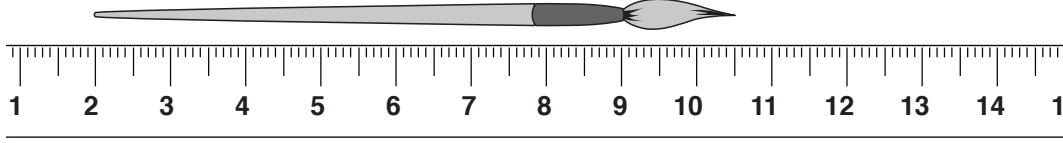
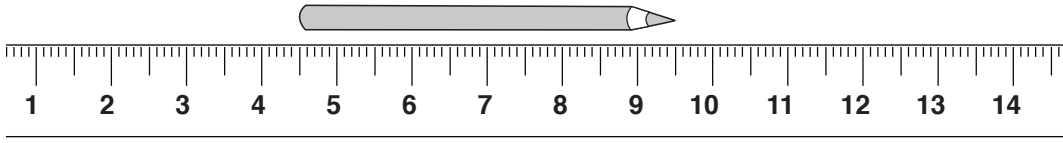
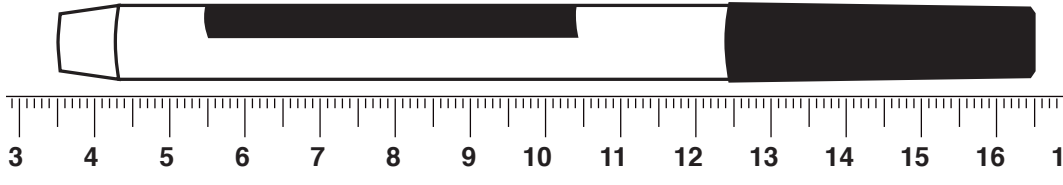
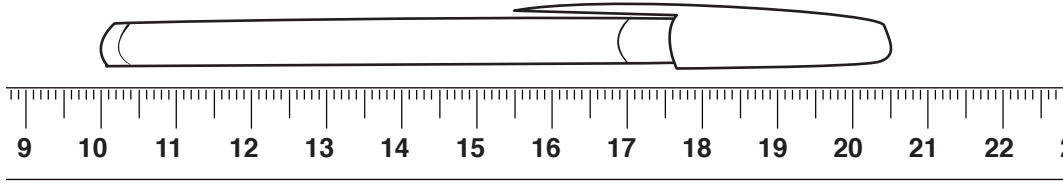
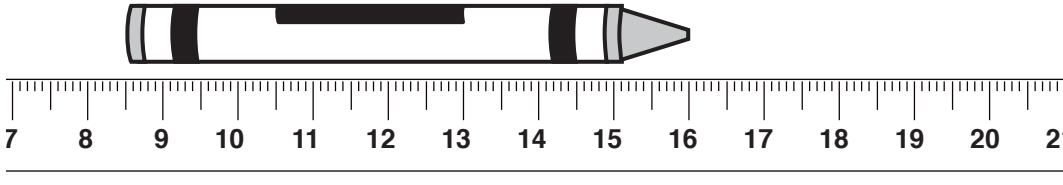
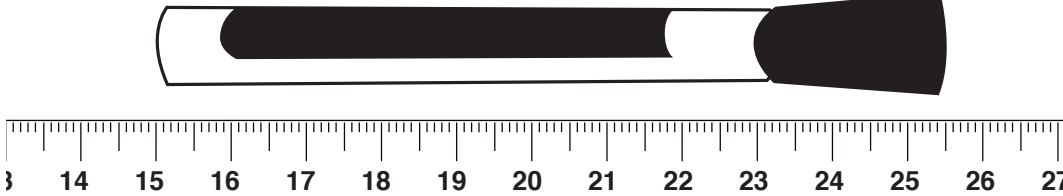


NAME \_\_\_\_\_

DATE \_\_\_\_\_

# Linear Measurement page 1 of 3

Label each measurement in centimeters.

*(continued on next page)*

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Linear Measurement** page 2 of 3

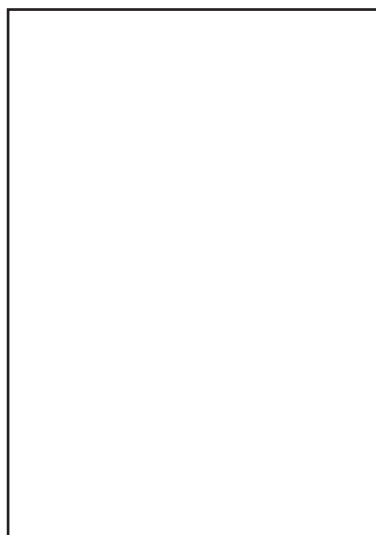
Measure the length of the objects listed below. Label the units of measurements. Round your measurement to the nearest whole centimeter or use fractions.

Object to be Measured	Length in Centimeters
<b>1</b> Long side of this record sheet	
<b>2</b> Length of a new pencil	
<b>3</b> Height of your desk	
<b>4</b> Your cubit (length from elbow to tip of middle finger)	

**5 CHALLENGE** Measure and label the sides of both rectangles in centimeters. Then find the area of each in square centimeters.



Area = \_\_\_\_\_ square cm



Area = \_\_\_\_\_ square cm

*(continued on next page)*

**Linear Measurement** page 3 of 3

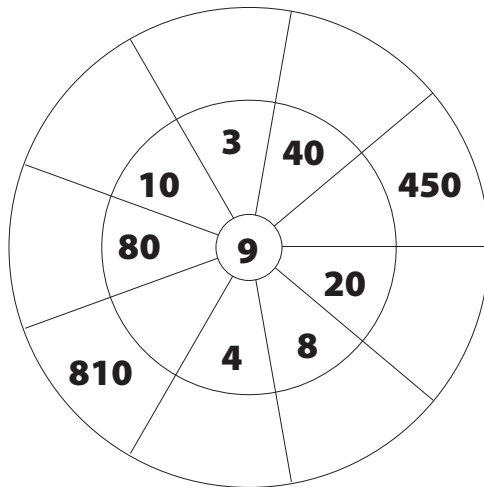
- 6** Would you use centimeters or meters to measure the length of
- a** your classroom? \_\_\_\_\_
  - b** your finger? \_\_\_\_\_
  - c** a truck? \_\_\_\_\_
  - d** a newborn puppy? \_\_\_\_\_
- 7** If a desk was 4 times as long as the length of this page, how long would it be? Measure this record sheet in centimeters. Then write and solve an equation to show how long the desk would be.
- 8** If the height of the door was 2 times the length of the desk in problem 7, how high would it be? Write and solve an equation to show how high the door would be.
- 9** A female grey whale is 2 times as long as a female killer whale. A female killer whale is 7 meters long. How long is a female grey whale in *centimeters*? Show your work.

A female grey whale is \_\_\_\_\_ centimeters long.



## Measuring Materials

- 1 Fill in the multiple wheel.



- 2 Would you use centimeters or meters to measure the length of
- your kitchen? \_\_\_\_\_
  - your ear? \_\_\_\_\_
  - a driveway? \_\_\_\_\_
  - a goldfish? \_\_\_\_\_
- 3 If a rug was 5 times as long as this record sheet, how long would it be? Measure the length of this record sheet in centimeters. Then write and solve an equation to show how long the rug would be in centimeters.
- 4 Mr. Brown's car is 4 meters long. The school bus is 3 times as long as Mr. Brown's car. How many *centimeters* long is the school bus? Show your work.

The school bus is \_\_\_\_\_ centimeters long.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Weight & Mass Benchmarks

Complete this page after you've filled the 4 bags with beans to make benchmarks for 1 gram, 1 kilogram, 1 ounce, and 1 pound.

- 1 How many beans did it take to make 1 gram?
  
- 2 The prefix *kilo* means one thousand, so there are 1,000 grams in a kilogram. Write and solve a multiplication equation to show how many beans there are in your kilogram bag without counting them.
  
- 3 How many beans are there in the 1-ounce bag?
  
- 4 There are 16 ounces in a pound. Write and solve a multiplication equation to show how many beans there are in your pound bag without counting them.
  
- 5 Which unit—the gram, kilogram, ounce, or pound—is the smallest?
  
- 6 Which unit—the gram, kilogram, ounce, or pound—is the largest?
  
- 7 About how many pounds do you think a kilogram weighs?
  
- 8 Look around the classroom, and list 3 objects that have about the same weight or mass as each of the benchmark bags you made.

1 gram (g)	1 kilogram (kg)	1 ounce (oz)	1 pound (lb)

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Weight & Mass Story Problems

For each problem, show your thinking with numbers, sketches, or words. Then write an equation that represents your work.

- 1** At the bakery down the street, you can get a small chocolate chip cookie that has a mass of 25 grams. You can get a giant chocolate chip cookie with a mass that is 5 times as much as a small chocolate chip cookie. What is the mass of the giant chocolate chip cookie?

\_\_\_\_\_  
Equation\_\_\_\_\_  
Answer, labeled with correct units

- 2** Ebony has a bag of grapes that weighs 8 ounces. Alex has 4 times as many bags of grapes, and each bag weighs 8 ounces. What is the weight of Alex's bags of grapes in all?

\_\_\_\_\_  
Equation\_\_\_\_\_  
Answer, labeled with correct units

- 3** Sara was picking blueberries. She filled a 16-ounce container. Dan picked 3 times as many 16 ounce containers as Sara. How many ounces of blueberries did Dan pick?

\_\_\_\_\_  
Equation\_\_\_\_\_  
Answer, labeled with correct units



NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Comparing Quantities

For each problem, show your thinking with numbers, sketches, or words. Then write an equation that represents your work.

- 1** Millie and Sam are drinking water. Millie has 11 milliliters of water left in her water bottle. Sam has 4 times that much left in his water bottle. How many milliliters of water are left in Sam's water bottle?

\_\_\_\_\_  
Equation\_\_\_\_\_  
Answer, labeled with correct units

- 2** Miguel and Polly are drinking juice. Polly has 25 milliliters of juice left in her cup. Miguel has 4 times that much juice left in his cup. How many milliliters of juice does Miguel have left?

\_\_\_\_\_  
Equation\_\_\_\_\_  
Answer, labeled with correct units

- 3** Hannah has an aquarium with 25 liters of water in it. How many milliliters of water are in the aquarium?

\_\_\_\_\_  
Equation\_\_\_\_\_  
Answer, labeled with correct units

- 4** **CHALLENGE** Ruby scooped 25,000 milliliters of saltwater from her boat. How many liters of saltwater did she scoop?

\_\_\_\_\_  
Equation\_\_\_\_\_  
Answer, labeled with correct units

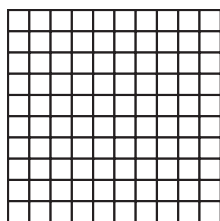


NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Base Ten Area Pieces



mat



strip



unit

Write and solve an equation for each problem below.

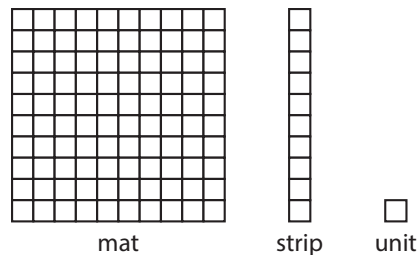
- 1 Max has 5 strips. How many units are in Max's strips in all? \_\_\_\_\_
- 2 Amelia has 10 times as many strips as Max.
  - a How many strips does Amelia have? \_\_\_\_\_
  - b How many units are in Amelia's strips in all? \_\_\_\_\_
  - c How many mats can Amelia make with her strips? \_\_\_\_\_
- 3 Leon has 8 strips. How many units are in Leon's strips in all? \_\_\_\_\_
- 4 Zia has 100 times as many strips as Leon.
  - a How many strips does Zia have? \_\_\_\_\_
  - b How many units are in Zia's strips in all? \_\_\_\_\_
  - c How many mats can Zia make with her strips? \_\_\_\_\_
  - d How many strip-mats can Zia make with her strips? \_\_\_\_\_
- 5 Sage has 3 strip-mats, 3 mats, and 2 units. Tristan has 2 mats, 8 strips, and 5 units. Andre has twice as many strip-mats, mats, and units as Sage.
  - a How many units is that in all? Show your work.



## Multiplicative Comparisons on the Wall

You'll need to be able to see the Great Wall of Base Ten in your classroom to complete parts of this sheet.

- 1** Here are the three smallest pieces on the Great Wall: the unit, the strip, and the mat. Use them to help answer problems a–c below.



- a** Fill in the blanks below.

The strip is \_\_\_\_\_ times as big as the unit.

The mat is \_\_\_\_\_ times as big as the strip.

- b** Andrew says that the mat is 1,000 times as big as the unit. Do you agree? Why or why not?

- c** Which equation tells how many times bigger the mat is than the strip?

$1 \times 100 = 100$

$100 = 10 \times 10$

$100 = 10 + 10$

- 2** Now look at all the pieces on the Great Wall of Base Ten in your classroom. Fill in the blanks to complete these statements of multiplicative comparison.

**a** The strip-mat is \_\_\_\_\_ times as big as the mat.

**b** The mat-mat is 100 times as big as the \_\_\_\_\_.

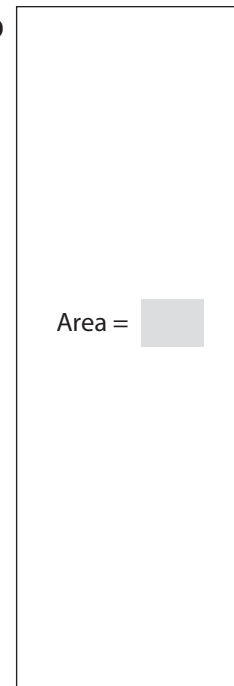
**c** The strip-mat is \_\_\_\_\_ times as big as strip.

- 3** In the number 222, the 2 in the hundreds place is worth \_\_\_\_\_ times as much as the 2 in the tens place.



## Finding Areas of Rectangles

- 1** Measure and label the dimensions of both rectangles in centimeters. Then find the area of each in square centimeters. Show your work

**a****b**

- 2** Measure the dimensions of this page to the nearest whole centimeter. Use the information to determine the area of the page. Label each measurement with the correct units.

Work space:

Length of the page: \_\_\_\_\_

Width of the page: \_\_\_\_\_

Area of the page: \_\_\_\_\_

- 3** How would you find the area of the floor of our classroom? What units would you use? Draw a sketch and explain your thinking in the space below.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## A New Room for Nick

Nick is moving to a new house. His new room is smaller than his room where he used to live. Nick is using a meter stick to measure several items to see if they will fit in his new room.

- 1 Nick is measuring the length of his bed. What unit should Nick use? \_\_\_\_\_
- 2 Nick is measuring the width of his mp3 player. What unit should Nick use? \_\_\_\_\_
- 3 Nick is measuring the height of his chair. What unit should Nick use? \_\_\_\_\_
- 4 Nick has a rug that is 12 decimeters by 18 decimeters. Draw a small, labeled sketch of Nick's rug. Then, find the area of his rug in square decimeters.

Write an equation that shows the area of the rug: \_\_\_\_\_

- 5 There is a window in Nick's new room that is 11 decimeters by 15 decimeters. Draw a small, labeled sketch of the window. Then, find the area of the window in square decimeters.

Write an equation that shows the area of the window: \_\_\_\_\_

- 6 The back of Nick's bookcase measures 10 decimeters by 18 decimeters. Nick thinks its area is 108 square decimeters. Do you agree? Use numbers, labeled sketches, or words to explain your answer.



# Work Place Instructions 2A What's Missing? Bingo

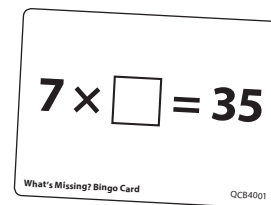
## Each pair of players needs:

- 2 What's Missing? Bingo Record Sheets
- a deck of What's Missing? Bingo Cards to share

- 1 Each player chooses one of the bingo boards on their own record sheet. Players need to choose different boards.
- 2 Players decide who will go first, shuffle the cards, and place them in a stack face-down.
- 3 Players take turns drawing a card from the top of the stack and then work together to determine what the missing number is.

*Sage* Hmm ... this means that something times 7 is 35. What times 7 is 35?

*Nicole* I remember! It's 5.



- 4 Both players mark an X over the missing number if it appears on their bingo board. Some numbers may appear more than once, so players should think carefully about where they mark the X. (A player can only mark one number on each turn, even if there are 2 or more of the same number on the board.)

Unit 2 Module 1 | Session 4 | 1 class set, plus more as needed, stored in the Work Place tray

NAME Sage | DATE \_\_\_\_\_

**What's Missing? Bingo Record Sheet**

Board 1				Board 2			
2	6	7	3	10	<del>8</del>	5	4
5	4	9	2	6	<del>4</del>	<del>2</del>	7
4	7	5	8	9	<del>5</del>	6	3
3	8	6	10	<del>8</del>	3	<del>2</del>	2

Unit 2 Module 1 | Session 4 | 1 class set, plus more as needed, stored in the Work Place tray

NAME Nicole | DATE \_\_\_\_\_

**What's Missing? Bingo Record Sheet**

Board 1				Board 2			
2	6	7	<del>8</del>	10	3	5	4
5	4	<del>9</del>	2	6	4	9	7
<del>4</del>	<del>2</del>	<del>5</del>	<del>8</del>	9	5	6	3
<del>3</del>	<del>8</del>	6	10	<del>8</del>	<del>3</del>	7	2

*Nicole* There are two 5s on my board, but if I put my x here, I can get 4 in a row and win!

- 5 Players continue to take turns drawing cards and marking their boards until one of them gets 4 in a row, horizontally, vertically, or diagonally.

## Game Variations

- A Play the game more than once. Since both players have 4 boards on their sheets, they can play up to 4 times in a single session, as long as they choose a different board than their partner each time.
- B Play for blackout instead of 4 in a row. (Blackout is when one player marks off every number on his or her bingo board.)
- C Play with two boards instead of one. (Players can still mark only one number per turn, but in playing this version of the game, they can move between the two boards, switching from one to the other whenever they want.) The first player to get 4 in a row on both boards wins.  
Be sure each player chooses the 2 boards his or her partner is not using. For example, Player 1 might use Boards 1 and 4, while Player 2 uses Boards 2 and 3.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Flora Tries Again

After Flora found that the piece of cloth she'd cut wasn't big enough, she tried again several times to cut a piece that was exactly 240 square centimeters. Here are the dimensions of the four other rectangles she cut.

$$\begin{array}{r} 10 \text{ cm} \\ \times 8 \text{ cm} \\ \hline \end{array}$$

$$\begin{array}{r} 10 \text{ cm} \\ \times 12 \text{ cm} \\ \hline \end{array}$$

$$\begin{array}{r} 10 \text{ cm} \\ \times 15 \text{ cm} \\ \hline \end{array}$$

$$\begin{array}{r} 10 \text{ cm} \\ \times 23 \text{ cm} \\ \hline \end{array}$$

- 1** Circle the combination you believe will produce a piece of cloth closest to the size Flora needs.
- 2** Create a rectangular array with base ten area pieces to model each of the combinations.
- 3** For each combination, find the area of the piece of cloth Flora cut. Record your answers below, and be sure to label them with the proper units.
  - a**  $10 \text{ cm} \times 8 \text{ cm} = \underline{\hspace{2cm}}$
  - b**  $10 \text{ cm} \times 12 \text{ cm} = \underline{\hspace{2cm}}$
  - c**  $10 \text{ cm} \times 15 \text{ cm} = \underline{\hspace{2cm}}$
  - d**  $10 \text{ cm} \times 23 \text{ cm} = \underline{\hspace{2cm}}$
- 4** **CHALLENGE** Can you think of more than one way for Flora to cut a rectangle that is exactly 240 square centimeters?



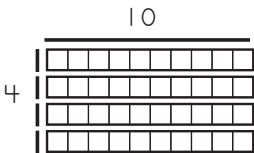
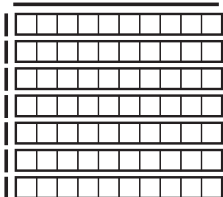
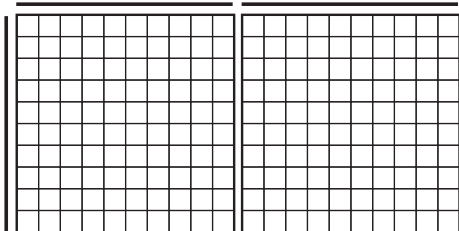
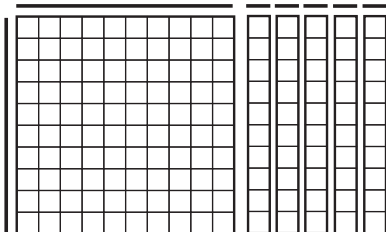
NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Arrays & Equations for Tens

**1** For each rectangle below, label the dimensions, find the area, and write a multiplication equation to describe the array.

Labeled Array	Area	Multiplication Equation
<p><b>ex</b></p> 	40	$4 \times 10 = 40$
<p><b>a</b></p> 		
<p><b>b</b></p> 		
<p><b>c</b></p> 		

**2** Complete the multiplication facts below.

$10 \times 4 = \underline{\hspace{2cm}}$

$10 \times 2 = \underline{\hspace{2cm}}$

$10 \times 9 = \underline{\hspace{2cm}}$

$10 \times 3 = \underline{\hspace{2cm}}$

$10 \times 5 = \underline{\hspace{2cm}}$

$10 \times 8 = \underline{\hspace{2cm}}$

$$\begin{array}{r} 14 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 11 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 19 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 30 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 40 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 50 \\ \times 10 \\ \hline \end{array}$$

**3** What happens every time you multiply a number by 10? Why?

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Multiplication Arrays

Build each array below. Then write an expression or equation to show how you found the product, and record the product in the last column.

Build This Array	Expression or Equation	Product
<b>1</b> $14 \times 11$		
<b>2</b> $11 \times 16$		
<b>3</b> $15 \times 21$		
<b>4</b> $12 \times 16$		

**5** Write a story problem to match one of the combinations above.

**6 CHALLENGE** The perimeter of Square A is 24 linear units. The area of Square B is 4 times the area of Square A. What is the area of Square B? What is the perimeter of Square B? Show your work.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Fill the Frames

Label each array frame below. Then fill it in with labeled rectangles. Write an addition equation to show how you got the total. Then write a multiplication equation to match the array.

Labeled Array Frame & Rectangle	Addition Equation	Multiplication Equation
<p><b>ex</b></p>	$40 + 12 = 52$	$4 \times 13 = 52$
<p><b>1</b></p>		
<p><b>2</b></p>		
<p><b>3</b></p>		



## Work Place Instructions 2B Division Capture

### Each pair of players needs:

- 1 2B Division Capture Record Sheet to share
- 1 spinner overlay to share
- 1 red and 1 blue colored pencil

- 1** Players each spin the spinner. The player who gets the higher number goes first, and decides whether to use the red or the blue pencil to mark his or her combinations.
- 2** Players take turns spinning the spinner and using the number spun to complete one of the division problems on the sheet.
  - Each player needs to be sure to use his or her own color, blue or red.
  - If the box a player needs is already filled, that player loses the turn.
  - Players try to capture 3 or 4 boxes in a row, horizontally, vertically, or diagonally.
- 3** Players continue taking turns until the game board is filled or neither player can use the number he or she spins 3 times in a row.
- 4** Players then circle the places on the grid where they got 3 or more in a row, and add up their scores. The player with the higher score wins the game.  
3 in a row scores 1 point; 4 in a row scores 2 points; and 5 in a row scores 3 points.

### Game Variations

- A** There are three different record sheets for this game. Each is more challenging than the one before it. If the first and second sheets are easy, try using the third sheet.



## Groceries & Laundry

- 1** Gregory bought some apricots for his 3 sisters. Each apricot cost 15¢. He bought 3 apricots for each sister.
- a** How much did Gregory spend altogether? Show all your work.
- b** Fill in the bubble beside the equation that best represents this problem ( $m$  stands for money).
- $3 \times (3 \times 15\text{¢}) = m$
- $3 + 15\text{¢} + 3 = m$
- $(3 \times 15\text{¢}) - 3 = m$
- 2** Lucia bought 3 pounds of carrots for 75¢ a pound. She also bought a box of crackers. In all, Lucia spent \$4.54.
- a** How much did the box of crackers cost? Show all your work.
- b** Fill in the bubble beside the equation that best represents this problem ( $c$  stands for the cost of the crackers).
- $\$4.54 - c = 75\text{¢}$
- $(3 \times 75\text{¢}) + c = \$4.54$
- $(3 + 75\text{¢}) \times c = \$4.54$
- 3** **CHALLENGE** DJ is doing laundry in his apartment building. It costs \$1.00 to run the washing machine and \$1.25 to run the dryer. DJ has 27 quarters. How many loads of laundry can he put through the washer and dryer? Show all your work.

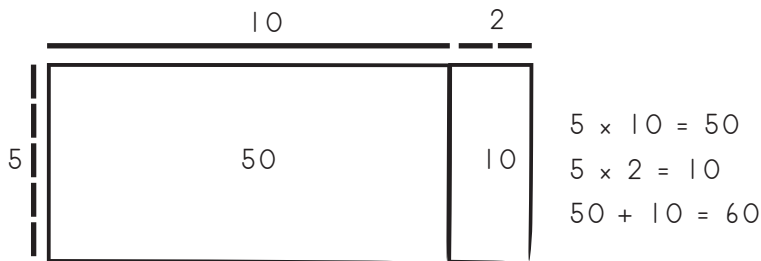
NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Estimate & Sketch page 1 of 2

For each frame below label each dimension with a regular pencil. Imagine what the area of the rectangle will be once you've filled it in. Then check your thinking by making a quick sketch. Write the area of each rectangle you draw in red pencil. Write a multiplication equation to match the rectangle.

**ex**

Multiplication Equation  $5 \times 12 = 60$

**1**

Multiplication Equation \_\_\_\_\_

*(continued on next page)*

NAME \_\_\_\_\_

DATE \_\_\_\_\_

### Estimate & Sketch page 2 of 2

**2**



Multiplication Equation \_\_\_\_\_

**3**



Multiplication Equation \_\_\_\_\_



## Multiplication Arrays

- 1** Lida is solving  $6 \times 15$ .
  - a** Sketch and label an open array for  $6 \times 15$ .
  
  
  
  
  
  
  
  
  
  
  - b** What is the product of  $6 \times 15$ ? \_\_\_\_\_
  
- 2** Tomas is solving  $3 \times 22$ .
  - a** Sketch and label an open array for  $3 \times 22$ .
  
  
  
  
  
  
  
  
  
  
  - b** What is the product of  $3 \times 22$ ? \_\_\_\_\_
  
- 3** Rowan is solving  $7 \times 12$ .
  - a** Sketch and label an open array for  $7 \times 12$ .
  
  
  
  
  
  
  
  
  
  
  - b** What is the product of  $7 \times 12$ ? \_\_\_\_\_
  
- 4** True or False?
  - a**  $6 \times 15 = (6 \times 10) + (6 \times 5)$  \_\_\_\_\_
  - b**  $3 \times 22 = (3 \times 20) + (3 \times 10)$  \_\_\_\_\_
  - c**  $7 \times 12 = (7 \times 10) - (7 \times 2)$  \_\_\_\_\_
  - d**  $9 \times 17 = (9 \times 10) + (9 \times 7)$  \_\_\_\_\_



NAME \_\_\_\_\_

DATE \_\_\_\_\_

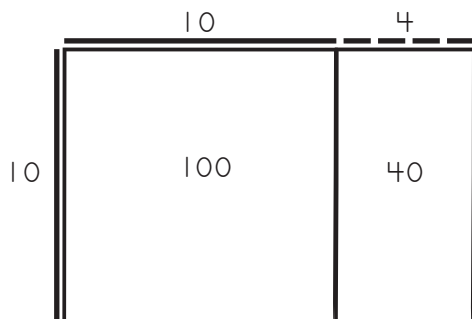


# Multiplying by Ten, One Hundred & One Thousand page 1 of 2

**1** For each problem, a–c:

- Label the dimensions.
- Fill in the area and label it.
- Write a multiplication equation to match.

**ex**



**a**



**b**



**c**



*(continued on next page)*

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Multiplying by Ten, One Hundred & One Thousand** page 2 of 2**2** Write the answers.

$$\begin{array}{r} 31 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 17 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 10 \\ \times 72 \\ \hline \end{array}$$

$$\begin{array}{r} 89 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 68 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 10 \\ \times 50 \\ \hline \end{array}$$

$$\begin{array}{r} 400 \\ \times 10 \\ \hline \end{array}$$

**3** Fill in the rest of this sentence.

When you multiply any number by 10, \_\_\_\_\_  
\_\_\_\_\_.

**4** Write the answers.

$$\begin{array}{r} 29 \\ \times 100 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ \times 100 \\ \hline \end{array}$$

$$\begin{array}{r} 100 \\ \times 62 \\ \hline \end{array}$$

$$\begin{array}{r} 46 \\ \times 100 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \times 100 \\ \hline \end{array}$$

$$\begin{array}{r} 61 \\ \times 100 \\ \hline \end{array}$$

$$\begin{array}{r} 300 \\ \times 100 \\ \hline \end{array}$$

$$35 \times 1,000 = \underline{\hspace{2cm}}$$

$$1,000 \times 19 = \underline{\hspace{2cm}}$$

$$40 \times 1,000 = \underline{\hspace{2cm}}$$

**5** The Ladybugs are planting a garden. They have a 25 cm-by-10 cm rectangle for flowers. Each flower needs exactly 1 square centimeter of space. How many flowers can they plant? Show your work.

The Ladybugs can plant \_\_\_\_\_ flowers.

**6** **CHALLENGE** The Ladybugs have a 30 cm-by-10 cm rectangle for pumpkins. Each pumpkin needs exactly 25 square centimeters of space. How many pumpkins can they plant? Show your work on another piece of paper. Include a labeled sketch.

The Ladybugs can plant \_\_\_\_\_ pumpkins.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Multiplication Practice

**1** Solve these problems with mental computation. Write the answers.

$$\begin{array}{r} 10 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 30 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 40 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 50 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 60 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 70 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 80 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 90 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 100 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 1,000 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 10,000 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 100,000 \\ \times 3 \\ \hline \end{array}$$

**2** Explain how you figured out the answers to the problems above.

**3** Solve these problems in your head. Write the answers.

$$\begin{array}{r} 10 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 30 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 40 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 50 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 60 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 70 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 80 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 90 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 100 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 1,000 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 60 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 70 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 80 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 400 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 300 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 500 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 600 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 200 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 700 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 800 \\ \times 5 \\ \hline \end{array}$$

**4** **CHALLENGE**

$$\begin{array}{r} 900 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 400 \\ \times 12 \\ \hline \end{array}$$

$$\begin{array}{r} 800 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 600 \\ \times 12 \\ \hline \end{array}$$

$$\begin{array}{r} 700 \\ \times 11 \\ \hline \end{array}$$

$$\begin{array}{r} 800 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 800 \\ \times 12 \\ \hline \end{array}$$

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Ratio Table Equations

**1** Look at your own ratio table.

Write the entries for rows 1, 2, 3, 10, 20, and 30 as equations.

**a** Example: A ratio table for 39 shows 10 across from 390, so we would write  $39 \times 10 = 390$  for row 10.

9	351
10	390
11	429

$$\underline{\quad} \times 1 = \underline{\quad}$$

$$\underline{\quad} \times 2 = \underline{\quad}$$

$$\underline{\quad} \times 3 = \underline{\quad}$$

$$\underline{\quad} \times 10 = \underline{\quad}$$

$$\underline{\quad} \times 20 = \underline{\quad}$$

$$\underline{\quad} \times 30 = \underline{\quad}$$

**2** Look at a different ratio table.

Write the entries for rows 1, 2, 3, 10, 20, and 30 as equations.

$$\underline{\quad} \times 1 = \underline{\quad}$$

$$\underline{\quad} \times 2 = \underline{\quad}$$

$$\underline{\quad} \times 3 = \underline{\quad}$$

$$\underline{\quad} \times 10 = \underline{\quad}$$

$$\underline{\quad} \times 20 = \underline{\quad}$$

$$\underline{\quad} \times 30 = \underline{\quad}$$

**3** Look at a different ratio table.

Write the entries for rows 1, 2, 3, 10, 20, and 30 as equations.

$$\underline{\quad} \times 1 = \underline{\quad}$$

$$\underline{\quad} \times 2 = \underline{\quad}$$

$$\underline{\quad} \times 3 = \underline{\quad}$$

$$\underline{\quad} \times 10 = \underline{\quad}$$

$$\underline{\quad} \times 20 = \underline{\quad}$$

$$\underline{\quad} \times 30 = \underline{\quad}$$

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Ratio Table Practice

1 This is part of a ratio table made by a fourth grade student.

3	45
4	60
5	75
6	90
7	105

a What number was the student multiplying for this ratio table? \_\_\_\_\_

b What number would come next in each column? \_\_\_\_\_ and \_\_\_\_\_

2 Fill in the ratio table below.

1	7
2	14
3	
	28
5	
	42

3 Is 21 a prime number? How do you know?

4 Fill in the blanks in the table below.

$2 \times \underline{\hspace{2cm}} = 28$

$\underline{\hspace{2cm}} \times 3 = 42$

$4 \times 14 = \underline{\hspace{2cm}}$

$9 \times \underline{\hspace{2cm}} = 54$

$\underline{\hspace{2cm}} \times 7 = 63$

$9 \times 8 = \underline{\hspace{2cm}}$

$\underline{\hspace{2cm}} \times 12 = 24$

$3 \times \underline{\hspace{2cm}} = 36$

$4 \times 12 = \underline{\hspace{2cm}}$

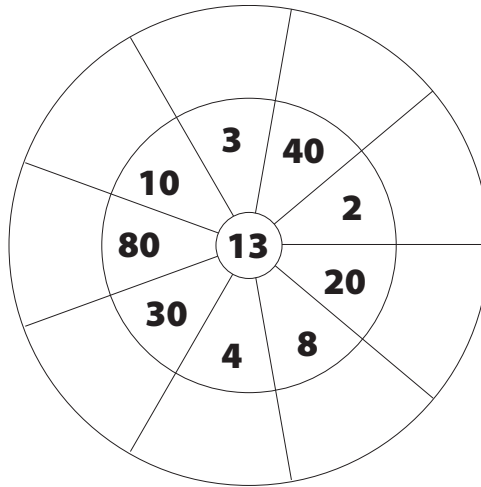
NAME \_\_\_\_\_

DATE \_\_\_\_\_



## More Multiplication

1 Fill in the Multiple Wheel.



2 For the problem  $22 \times 10$ , which of the following statements is **not** correct?

- $22 \times 10$  is 10 twenty-twos.
- $22 \times 10$  has to be more than 200 because  $20 \times 10 = 200$ .
- $22 \times 10$  is 22 add 0.
- $22 \times 10$  is 22 tens.

3 Fill in the blanks.

$$\begin{array}{r} 10 \\ \times 19 \\ \hline \end{array}$$

$$\begin{array}{r} 45 \\ \times \square \\ \hline 450 \end{array}$$

$$\begin{array}{r} 21 \\ \times 20 \\ \hline \end{array}$$

$$\begin{array}{r} 12 \\ \times \square \\ \hline 360 \end{array}$$

$$\begin{array}{r} \square \\ \times 10 \\ \hline 240 \end{array}$$

$$\begin{array}{r} \square \\ \times 40 \\ \hline 800 \end{array}$$

$$\begin{array}{r} 84 \\ \times 20 \\ \hline \end{array}$$



## Riley's & Raymond's Ratio Tables

**1** Riley made a ratio table, but you can only see this part of it.

9	198
10	220
11	242

- a** What number did Riley use to make her ratio table? \_\_\_\_\_
- b** What is the 13th row? \_\_\_\_\_
- c** What is the 5th row? \_\_\_\_\_

**2** Raymond made a ratio table, but you can only see this part of it.

17	306
18	324
19	342
20	360

- a** What number did Raymond use to make his ratio table? \_\_\_\_\_
- b** What is the 10th row? \_\_\_\_\_
- c** What is the 22nd row? \_\_\_\_\_





**3** **CHALLENGE** The area of a rectangle is 280 and one dimension is 14. What is the other dimension?

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Maggie's Chickens

	Problem	What is the problem asking us to do?	Reasonable estimates	Answer
	<b>1</b> Maggie's chickens live in a coop in her backyard. The coop is 12 feet by 13 feet. What is the area of the coop?			sq. ft.
	<b>2</b> Maggie is getting several more chickens. She built a new coop in her backyard for the new chickens. This coop is 6 feet by 26 feet. What is the area of the new coop?			sq. ft.
	<b>3</b> Maggie's pig just had a litter of piglets. Maggie's mother built a pen for the piglets. The pen is 16 feet by 12 feet. What is the area of the pen?			sq. ft.
	<b>4</b> As the piglets grow they will need more space. Maggie's dad is building another pen for half of the pigs. This pen is 24 feet by 8 feet. What is the area of this pen?			sq. ft.





## Eggs & Apples

Read each problem and estimate the answer. Think about familiar strategies that will help you solve the problems. Show your work using numbers, labeled sketches, or words.

**1** Maggie has 15 chickens. Each chicken lays 24 eggs a month. How many eggs do Maggie's chickens lay in a month in all?

**a** My estimate: \_\_\_\_\_

**b** My work:

Maggie's chickens lay \_\_\_\_\_ eggs in a month altogether.

**c** What strategy did you use? Why did you choose this strategy?

**2** Maggie is picking apples for her chickens. She has 12 baskets. She puts 30 apples in each basket. How many apples does Maggie pick in all?

**a** My estimate: \_\_\_\_\_

**b** My work:

Maggie picks \_\_\_\_\_ apples in all.

**c** What strategy did you use? Why did you choose this strategy?



## Mario's Marbles

Mario loves marbles and is always adding new marbles to his collection. Help Mario keep track of his marbles in the following problems. Show your work using numbers, labeled sketches, or words. Write a multiplication equation for problems 1 and 2.

- 1** Mario organized some of his marbles. He used lots of marbles to make 11 piles. Each pile had 14 marbles. How many marbles did he use in all?

Equation: \_\_\_\_\_

- 2** Mario organized the rest of his marbles. He made 7 piles and put 22 marbles in each pile. How many marbles did he use in all?

Equation: \_\_\_\_\_

- 3** Mario saw bags of marbles for sale at the store. One bag had 49 marbles in it. Mario wondered if he could organize the 49 marbles into equal piles.

**a** Is 49 prime or composite?

**b** Can Mario organize his marbles into equal piles? Explain your answer.

- 4** Another bag of marbles has 61 marbles in it. Mario wondered if he could organize the 61 marbles into equal piles.

**a** Is 61 prime or composite?

**b** Can Mario organize his marbles into equal piles? Explain your answer.



## How Can You Solve ... ?

Corinne is in fourth grade and she has to solve a lot of math problems. Help Corinne solve the following problems.

- 1** Corinne has to solve  $10 \times 8$  and  $5 \times 16$ .
  - a** What observations can you share with Corinne about these problems to help her solve them?
  
  
  
  
  
  
  
  
  
  
  - b** How would you tell or show Corinne how to solve these problems?
  
  
  
  
  
  
  
  
  
  
  - c** Solve  $10 \times 8$  and  $16 \times 5$ .
  
- 2** Corinne has to solve  $12 \times 9$  and  $18 \times 6$ .
  - a** What observations can you share with Corinne about these problems to help her solve them?
  
  
  
  
  
  
  
  
  
  
  - b** How would you tell or show Corinne how to solve these problems?
  
  
  
  
  
  
  
  
  
  
  - c** Solve  $12 \times 9$  and  $18 \times 6$ .



## Work Place Instructions 2C Moolah on My Mind

### Each pair of players needs:

- 2 dice numbered 1–6
- spinner overlay
- a 2C Moolah on My Mind Record Sheet for each player

- 1 Players take turns rolling one die. The player with the higher number goes first.
- 2 Player 1 rolls both dice, adds the two numbers, and then spins the coin spinner.
- 3 Player 1 writes an expression in the first column to show the results of the rolls and spin.
- 4 Player 1 multiplies to find out how much money she collected and writes that amount in the second column. Then Player 1 writes it again in the last column so she can keep a running total of her money.
- 5 Then it is Player 2's turn. Player 2 repeats Steps 3, 4, and 5.
- 6 Players help each other make sure they are adding their money accurately and that each other's running totals are correct.

Unit 2 Module 3 | Session 4 class set, plus more as needed, stored in the work place tray

NAME Ravi | DATE \_\_\_\_\_

WP 2C Moolah on My Mind Record Sheet

Multiplication Expression sum of the 2 numbers times the coin value	Amount of Money You Got This Turn	Total So Far
$(2 + 5) \times 25¢$	\$1.75	\$1.75
$(5 + 4) \times 10¢$	\$.90	\$2.65

- 7 When both players have taken 10 turns, the game is over and the player with the most money wins.

### Game Variations

- A The player with the least amount of money at the end of the game wins.
- B Pick two numbers and call them “take-aways.” For example, a player’s take-aways could be 4 and 7. If two numbers are rolled that add up to one of the “take-aways” (such as  $3 + 4 = 7$ ), the player spins the coin spinner, multiplies the coin value by the take-away number, and takes that amount of money away from his total, instead of adding it.
- C Replace one of the 1–6 dice with a 4–9 die, or use two 4–9 dice instead. Players will multiply and add larger numbers.
- D Use the Challenge version of the Moolah on My Mind Record Sheet. Instead of adding the sum of the two dice, players choose whether to add, subtract or multiply the numbers. The winner is the player who finishes the game closest to \$6.00.



## How Much Money?

**1** Nadia has 2 nickels and 3 pennies. Taj has four times as much money as Nadia.

**a** How much money does Taj have? Show your work using numbers, labeled sketches or words.

**b** Fill in the bubble beside the equation that best represents this situation ( $m$  stands for Taj's money).

$(2 + 3) \times 4 = m$

$(2 + 3) - 4 = m$

$4 \times ((2 \times 5) + (3 \times 1)) = m$

**2** Zafar has 1 dime, 1 nickel, and 2 pennies. Petra has three times as much money as Zafar.

**a** How much money does Petra have? Show your work using numbers, labeled sketches, or words.

**b** Write an equation to represent this problem.

**3** **CHALLENGE** Sara has only nickels in her hand, and David has exactly the same number of dimes and no other coins. Together, they have a total of \$1.05. How many nickels does Sara have? How many dimes does David have? Show your work using numbers, labeled sketches, or words.

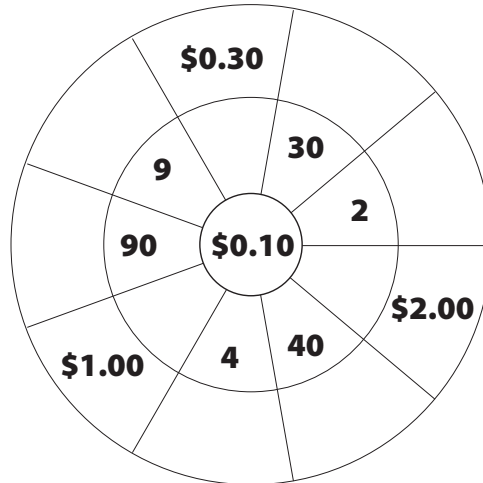
NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Money Multiple Wheel

1 Fill in the Multiple Wheel.



2 Fill in the blanks.

$$\begin{array}{r} 1 \\ \times 0.25 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times \square \\ \hline 90 \end{array}$$

$$\begin{array}{r} 11 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 11 \\ \times \square \\ \hline 220 \end{array}$$

$$\begin{array}{r} \square \\ \times 0.10 \\ \hline 0.40 \end{array}$$

$$\begin{array}{r} \square \\ \times 100 \\ \hline 400 \end{array}$$

$$\begin{array}{r} 64 \\ \times 20 \\ \hline \end{array}$$

3 Fill in the bubble beside every item below that is *not* correct.

- $10 \times 39$  is 39 tens
- $10 \times 39$  has to be less than 300 because  $10 \times 30 = 300$
- 39 is prime
- $10 \times 39$  is 39 hundreds

4 **CHALLENGE** Tera counted the coins in her bank and found 25 dimes, 12 quarters, and 15 nickels. If she saves twice as much next month, how much money will she have in all? Show your work.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Multiplication Tables

1 Complete the multiplication tables below.

**ex**

×	5	2	9	3	8	6	7	4
2	10	4	18	6	16	12	14	8

**a**

×	5	2	9	3	8	6	7	4
3								

**b**

×	5	2	9	3	8	6	7	4
4								

**c**

×	5	2	9	3	8	6	7	4
8								

2 Solve the division problems below.

$40 \div 5 = \underline{\quad\quad}$       $27 \div 3 = \underline{\quad\quad}$       $16 \div 4 = \underline{\quad\quad}$       $20 \div 5 = \underline{\quad\quad}$

$64 \div 8 = \underline{\quad\quad}$       $32 \div 4 = \underline{\quad\quad}$       $18 \div 6 = \underline{\quad\quad}$       $9 \div 3 = \underline{\quad\quad}$

3 **CHALLENGE** Solve the division problems below.

**a**  $47 \div 5 =$

**b**  $52 \div 6 =$

**c**  $82 \div 9 =$

**d**  $38 \div 3 =$

**e**  $75 \div 4 =$



## Sharing Problems

- 1** Kendra and Veronica's aunt gave them \$19 to spend at the store. If they split the money evenly, how much did they each get to spend? Use labeled sketches, numbers, or words to solve this problem. Show all your work.
  
- 2** Frank had 42 rocks that he wanted to share with his 4 friends. If he gave each friend the same number of rocks (and kept the same number of rocks for himself), how many rocks did each person get? Use labeled sketches, numbers, or words to solve this problem. Show all your work.
  
- 3** **CHALLENGE** Joe's grandma lives 36 blocks up the street from Joe. On Saturday, Joe rode his bike two-thirds of the way to his grandma's house and then realized he forgot the present he was going to give her. Joe rode back to his house, got the present, and rode all the way to his grandma's house. Then he rode straight home. How many blocks did Joe ride in all? Use labeled sketches, numbers, or words to solve this problem. Show all your work.





# Work Place Instructions 2D Remainders Win

## Each pair of players needs:

- 1 Remainders Win Record Sheet to share (Note: There are three pages of Remainders Win Record Sheets. Use a different page each time you play this game.)
- 1 die numbered 4–9
- scratch paper (optional)
- pencils

- 1 Players each roll the die. The player with the higher number is Player 1. Players write their names on the record sheet.
- 2 Player 1 circles one of the arrays on the record sheet in pencil and then calculates the product of the multiplication problem. This number will be the dividend.
- 3 Then Player 1 rolls the 4–9 die to produce the divisor, the number by which the dividend will be divided.
- 4 Player 1 records the division equation on the record sheet and players work together to find the answer. They circle the remainder, if there is one.

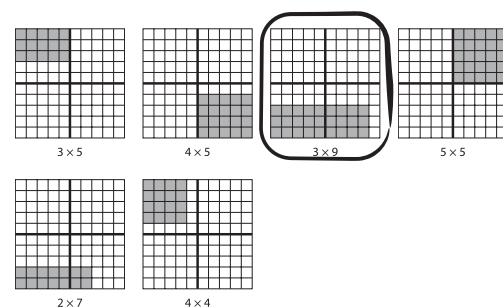
Unit 2 Module 4 | Session 4 class set, plus more as needed, stored in the Work Place tray

NAME Kathryn | DATE \_\_\_\_\_

**2D Remainders Win Record Sheet** page 1 of 3

Player 1 Kathryn Player 2 Brittany

$27 \div 6 = 4 \text{ R}3$	
Remainder Total	Remainder Total



Bridges in Mathematics Grade 4 Teacher Masters

T4

© The Math Learning Center | mathlearningcenter.org

- 5 Player 2 then repeats the steps with a new array.
- 6 Players take turns until all 10 arrays are used and 10 division equations are recorded on the record sheet (five for each player).
- 7 Players find the sums of their remainders. The player with the higher sum wins.

## Game Variations

- A Players choose arrays for each other rather than choosing their own.
- B Instead of the higher remainder sum winning, the lower sum wins.
- C Players roll the die first to determine the divisor and then choose an array.
- D Players roll two dice (two 1–6 dice, two 4–9 dice, or one of each), add the two numbers rolled, and divide the array's product by that number.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Multiplying with Money

**1** Use the arrays of coins to help solve each multiplication problem below. Show all your work.

<p><b>ex</b></p> $\begin{array}{r} 12 \\ \times 5 \\ \hline 60 \end{array}$		$\begin{array}{r} 5\text{¢} \times 4 = 20\text{¢} \\ 5\text{¢} \times 4 = 20\text{¢} \\ 5\text{¢} \times 4 = 20\text{¢} \\ \hline 60 \end{array}$	$\begin{array}{r} 20 \\ 20 \\ + 20 \\ \hline 60 \end{array}$
<p><b>a</b></p> $\begin{array}{r} 15 \\ \times 5 \\ \hline \end{array}$			
<p><b>b</b></p> $\begin{array}{r} 21 \\ \times 5 \\ \hline \end{array}$			

**2 CHALLENGE** Solve the multiplication problems below. Show all your work.

<p><b>a</b></p> $\begin{array}{r} 62 \\ \times 5 \\ \hline \end{array}$	<p><b>b</b></p> $\begin{array}{r} 63 \\ \times 5 \\ \hline \end{array}$
---	---



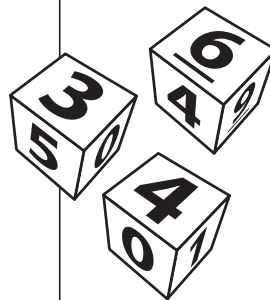
# Work Place Instructions 2E More or Less Multiplication p. 1 of 2

## Each pair of players needs:

- a 2E More or Less Multiplication Record Sheet
- 2 dice numbered 1–6
- 1 die numbered 4–9
- a more/less cube
- a calculator
- large base ten grid paper, if desired

- 1 Players take turns rolling the same die. The player with the higher number goes first.
- 2 Player 1 rolls the more/less cube to see if more or less is the goal and then circles the word on the record sheet.
- 3 Player 1 rolls the three numbered dice, records the numbers on the record sheet, and thinks about the best order for multiplying these three numbers.  
It may help to move the dice around.
- 4 Player 1 writes an expression to show the order to multiply the numbers.  
The two numbers that will be multiplied first are written in parentheses, with the third number outside the parentheses.



Unit 2 Module 4   Session 5 Double class set, plus more copies for the Work Place tray plus 1 copy for display	
NAME Sage	DATE
<b>2D More or Less Multiplication Record Sheet</b>	
Round 1 We played for (circle one) more / less.	
Player 1 rolled: 6 4 3	Player 2 rolled: _____
$(3 \times 4) \times 6$	$(\_\_ \times \_\_) \times \_\_$
$\_\_ \times \_\_ = \_\_$	$\_\_ \times \_\_ = \_\_$
Show your work:	Show your work:
$\_\_ \times \_\_ = \_\_$	$\_\_ \times \_\_ = \_\_$
Round 2 We played for (circle one) more / less.	





- 5 Player 1 multiplies the first two numbers inside the parentheses and writes the product, along with the third number, on the next line.
- 6 Player 1 finds the product and shows his work.
  - Players need to find a way to solve the problem using multiplication instead of repeated addition.
  - Players can use the base ten grid paper or multiplication facts they know to help.
  - Players cannot use the calculator for this part of the game.

(continued on next page)

## Work Place Instructions 2E More or Less Multiplication page 2 of 2

Unit 2 Module 4   Session 5 Double class set, plus more copies for the Work Place tray plus 1 copy for display	
NAME Sage	DATE _____
<b>2D More or Less Multiplication Record Sheet</b>	
<b>Round 1</b> We played for (circle one) more / less.	
Player 1 rolled: 6 4 3	Player 2 rolled: _____
$\begin{array}{r} (3 \times 4) \times 6 \\ 12 \times 6 = 72 \end{array}$	$\begin{array}{r} (\_\_ \times \_\_) \times \_\_ \\ \_\_ \times \_\_ = \_\_ \end{array}$
Show your work: $6 \times 10 = 60$ $6 \times 2 = 12$ $60 + 12 = 72$	Show your work: _____ _____
 $\_\_ \times / \div \_\_ = \_\_$	 $\_\_ \times / \div \_\_ = \_\_$
<b>Round 2</b> We played for (circle one) more / less.	

- 7** The Last Toss Option: If a player is not happy with his total, he can choose to roll the 1–6 die once, write the number in the box beside the little calculator, and then multiply or divide the total by that number. He can use a calculator to help do this part.

Unit 2 Module 4   Session 5 Double class set, plus more copies for the Work Place tray plus 1 copy for display	
NAME Sage	DATE _____
<b>2D More or Less Multiplication Record Sheet</b>	
<b>Round 1</b> We played for (circle one) more / less.	
Player 1 rolled: 6 4 3	Player 2 rolled: _____
$\begin{array}{r} (3 \times 4) \times 6 \\ 12 \times 6 = 72 \end{array}$	$\begin{array}{r} (\_\_ \times \_\_) \times \_\_ \\ \_\_ \times \_\_ = \_\_ \end{array}$
Show your work: $6 \times 10 = 60$ $6 \times 2 = 12$ $60 + 12 = 72$	Show your work: _____ _____
 $72 \times \textcircled{3} = 24$	 $\_\_ \times / \div \_\_ = \_\_$
<b>Round 2</b> We played for (circle one) more / less.	



- 8** Player 2 takes a turn rolling the three numbered dice and finding the product.
- 9** Players compare their totals and circle the winner.  
 The lower total wins if players rolled “less” at the start of the round. The higher total wins if they rolled “more” at the start of the round.
- 10** Players begin a new round.

### Game Variations

- A** Use two 4–9 dice and one 1–6 die instead so that players multiply larger numbers.
- B** Use the 2E More or Less Multiplication Challenge Record Sheet. Roll five dice and multiply three of the numbers together and then multiply the other two numbers together. Then decide if you want to add or subtract the two products. The winner is the player who gets closest to 150. For example:  
 Sage rolled a 5, 4, 8, 3, and 7. She decided to multiply the 3 and 7 and 8, then the 5 and 4. She subtracted the two products.

$$\begin{aligned} &(3 \times 7) \times 8 - (5 \times 4) \\ &21 \times 8 = 168 \text{ and } (5 \times 4) = 20 \\ &168 - 20 = 148 \end{aligned}$$



## Fourth Grade Games

**1** Conrad is playing More or Less Multiplication. He rolls “more” and 4, 7, and 6.

**a** How should Conrad order his numbers?

**b** How would you tell Conrad to multiply his numbers?

**c** Multiply Conrad’s numbers. Show your work.

**2** Mariah is playing Moolah on My Mind. She rolled a 3 and 4 and spun a quarter.

**a** Write an expression that represents this problem.

**b** How much money did Mariah get in this turn? Show your work.



## Multiplication & Division Practice

- 1** Carrie says that she can solve  $27 \times 20$  by first solving  $27 \times 2$  and then multiplying the product of  $27 \times 2$  by 10. Do you agree or disagree? Why?
  
  
  
  
  
  
  
  
  
  
- 2** Tarik has to solve the problem  $14 \times 30$ . He is not sure what to do.
  - a** How would you tell Tarik to solve the problem?
  
  
  
  
  
  
  
  
  
  
  - b** Solve  $14 \times 30$ .
  
  
  
  
  
  
  
  
  
  
- 3** There is a new pet store opening in the mall. They just got 52 tropical fish. They want to put 7 of these fish in each aquarium. How many aquariums will they need?
  - Use numbers, labeled sketches, or words to solve this problem.
  - Write the answer on the line below.

The pet store will need \_\_\_\_\_ aquariums to hold 52 fish.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Skills Practice

1 Fill in the blanks.

**a** \_\_\_\_\_ ml = 6 liters

**b** 10 liters = \_\_\_\_\_ ml

**c** 26 liters = \_\_\_\_\_ ml

2 Fill in the blanks on the ratio table.

Number of Soccer Teams	Number of Players on the Field
1	11
5	
	88
15	
	220

3 Which of the following lists contains only prime numbers?

13, 18, 21

15, 19, 27

11, 17, 31

7, 23, 39

4 Multiply.

$$\begin{array}{r} 45 \\ \times \square \\ \hline 450 \end{array}$$

$$\begin{array}{r} 89 \\ \times \square \\ \hline 8,900 \end{array}$$

$$\begin{array}{r} \square \\ \times 16 \\ \hline 1,600 \end{array}$$

$$\begin{array}{r} 33 \\ \times \square \\ \hline 330 \end{array}$$

$$\begin{array}{r} 21 \\ \times 10 \\ \hline \square \end{array}$$

$$\begin{array}{r} 62 \\ \times 100 \\ \hline \square \end{array}$$

$$\begin{array}{r} \square \\ \times 30 \\ \hline 210 \end{array}$$

5 There are 48 kids and 6 adults in the After-School Club, and they're all going to the zoo this afternoon. Each van holds 7 people. How many vans will the After-School Club need for this trip?

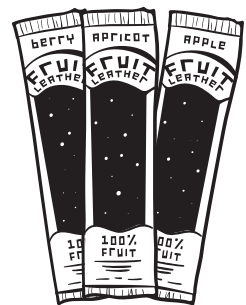
- Use numbers, labeled sketches, or words to solve this problem.
- Write the answer on the line below.

The After-School Club will need \_\_\_\_\_ vans to take all 54 people to the zoo.

 **Fair Shares** page 1 of 2

Work with a partner to solve at least two of the three problems on this page and the next. Use numbers, words, and labeled sketches to show all of your thinking. If you solve all three and have extra time, start the challenge problem on the next page.

- 1** Sally and her friends Vanessa, Ellie, and Helen have 3 strips of dried fruit to share. Each strip is 1" wide and 12" long. If the 4 girls share the strips fairly, how much will they each get?



- 2** One Saturday morning, Eduardo and his sister invited their two friends over to play. Before long, things were getting pretty noisy around the house, and Mrs. Ortega said, "If the four of you will pick up all the toys downstairs, I'll give you \$3.00 to spend at the corner store." If the 4 kids share the \$3.00 fairly, how much money will they each get?



*(continued on next page)*

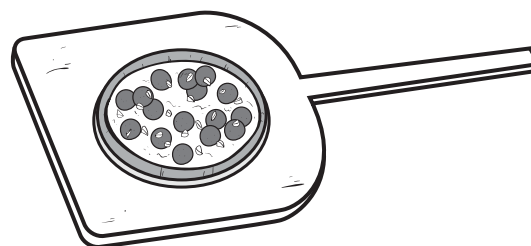


**Fair Shares** page 2 of 2

- 3** The gym at our school is open every evening from 5:00 to 8:00. If 4 different basketball teams want to use the gym on Thursday evening and they agree to split the time equally, how much practice time will each team get?



- 4 CHALLENGE** The coach took us out for pizza after our last game. There were 14 of us, so we had to split up and sit at different tables. Six of us sat at one table and got 4 medium pizzas to share equally. The other 8 of us sat at a different table and got 6 medium pizzas to share equally. Afterwards, Keira said it wasn't fair because some kids got more pizza than others. Do you agree with her? Use numbers, words, or labeled sketches to explain your answer.





## Share & Share Alike

**1** Solve each problem below. Show your work using numbers, labeled sketches, or words.

- a** Carmen has four cookies. Her friend Elisa joins her. Carmen shares her cookies evenly with her friend. How many cookies does each girl each get?
- b** Carmen and Elisa are about to eat the cookies when Sam and Michael join them. Carmen and Elisa share the cookies evenly with Sam and Michael. How many cookies does each person get?
- c** The group is about to eat their cookies when four more friends join them. Carmen collects the cookies and divides them evenly between all eight people. How many cookies does each person get?
- d** The cookies are eaten by the eight people. Imagine, though, that eight more people joined the group before they ate the cookies, and they all shared the cookies evenly. How much would each person have been given?

**2** Fill in the blank for each equation below.

**a**  $20 \times 35 = 2 \times \underline{\hspace{2cm}}$

**b**  $10 \times \underline{\hspace{2cm}} = 10 \times 5 \times 3$

**c**  $\underline{\hspace{2cm}} \times 30 = 9 \times 100$

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Fractions & Mixed Numbers page 1 of 2

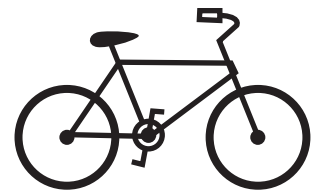
- 1** Change each of the fractions below into a mixed number. Use a labeled sketch and words to explain your answers. Use your fraction pieces to help if you want.

<p><b>ex</b> <math>\frac{7}{4} = 1\frac{3}{4}</math></p>	<table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td><math>\frac{1}{4}</math></td><td><math>\frac{1}{4}</math></td><td><math>\frac{1}{4}</math></td><td><math>\frac{1}{4}</math></td><td><math>\frac{1}{4}</math></td><td><math>\frac{1}{4}</math></td><td><math>\frac{1}{4}</math></td> </tr> <tr> <td colspan="4" style="text-align: center;"> </td> <td><math>\frac{1}{4}</math></td><td><math>\frac{1}{4}</math></td><td><math>\frac{1}{4}</math></td> </tr> </tbody> </table>	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$					$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$									
				$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$									
<p><b>a</b> <math>\frac{9}{8} =</math> <span style="background-color: #cccccc; display: inline-block; width: 40px; height: 20px; vertical-align: middle;"></span></p>															
<p><b>b</b> <math>\frac{19}{16} =</math> <span style="background-color: #cccccc; display: inline-block; width: 40px; height: 20px; vertical-align: middle;"></span></p>															
<p><b>c</b> <math>\frac{10}{4} =</math> <span style="background-color: #cccccc; display: inline-block; width: 40px; height: 20px; vertical-align: middle;"></span></p>															

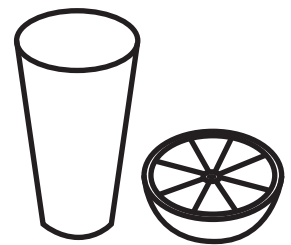
(continued on next page)

**Fractions & Mixed Numbers** page 2 of 2**2** For each of the problems on this page:

- Solve the problem and show your thinking with numbers, words, or labeled sketches. Use your fraction pieces to help if you want.
  - If the answer turns out to be an improper fraction (like  $\frac{3}{2}$  or  $\frac{7}{4}$ ) rename it as a mixed number (like  $1\frac{1}{2}$  or  $1\frac{3}{4}$ ).
- a** Carlos and his mom went out on a bike ride. They rode  $\frac{5}{8}$  of a mile to the park, and then  $\frac{5}{8}$  of a mile back home. How far did they ride in all?



- b** It takes  $\frac{3}{4}$  of a cup of orange juice to make 1 smoothie. Erin wants to make 2 smoothies. How much orange juice will she need?

**3** Change each of the mixed numbers below into a fraction. Use your fraction pieces to help.

<b>ex</b> $1\frac{3}{4} = \frac{7}{4}$	<b>a</b> $1\frac{3}{8} =$	<b>b</b> $1\frac{5}{16} =$
<b>c</b> $2\frac{1}{2} =$	<b>d</b> $2\frac{2}{4} =$	<b>e</b> $1\frac{7}{8} =$

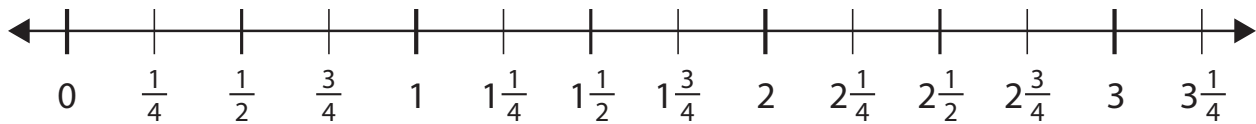
NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Fractions & Mixed Numbers on a Number Line

1 Use the number line to answer the questions below.



<b>ex</b>	What improper fraction is equal to $2\frac{1}{4}$ ? In other words, how many fourths are in two and one-fourth?	$\frac{9}{4}$
<b>ex</b>	What number is halfway between 2 and 3?	$2\frac{1}{2}$
<b>a</b>	What improper fraction is equal to $1\frac{1}{2}$ ? In other words, how many halves are in one and one-half?	
<b>b</b>	What mixed number is equal to $\frac{6}{4}$ ?	
<b>c</b>	Which is greater, $\frac{5}{4}$ or $1\frac{1}{2}$ ?	
<b>d</b>	What mixed number is equal to $\frac{13}{4}$ ?	
<b>e</b>	What improper fraction is equal to $2\frac{1}{2}$ ? In other words, how many halves are in two and one-half?	
<b>f</b>	Which is greater, $1\frac{3}{4}$ or $\frac{8}{4}$ ?	

### Challenge

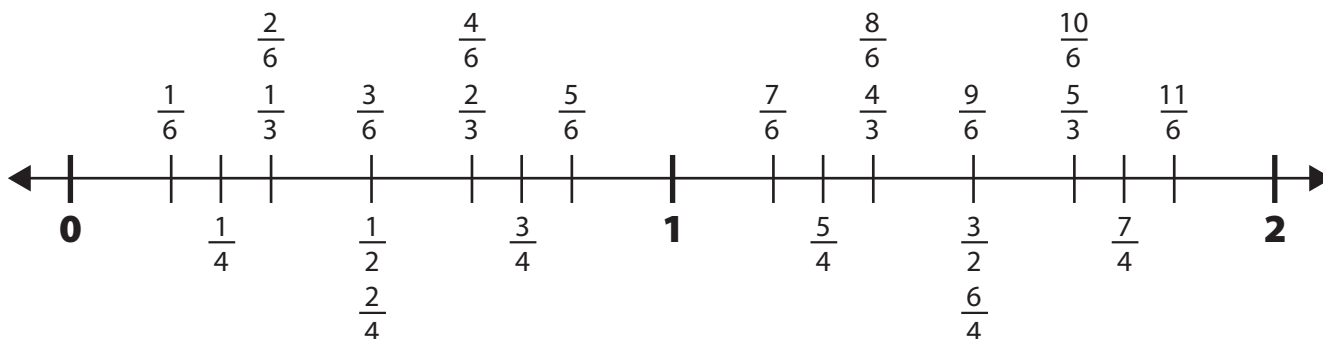
- 2 What number is halfway between 0 and 1?
- 3 What number is halfway between 0 and 3?
- 4 What number is halfway between 0 and 17?

NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Fractions & Division Tables



1 Write a greater than (>), less than (<), or equal sign in the circle to complete each equation below. Use the number line to help figure out which fraction is greater.

<b>ex</b> $\frac{1}{4} < \frac{1}{2}$	<b>a</b> $\frac{3}{4} \square \frac{5}{6}$	<b>b</b> $\frac{2}{3} \square \frac{4}{6}$
<b>c</b> $\frac{5}{3} \square \frac{5}{4}$	<b>d</b> $\frac{2}{3} \square \frac{3}{2}$	<b>e</b> $\frac{1}{3} \square \frac{3}{6}$

2 Complete the division tables below.

**ex**

÷	10	4	18	6	16	12	14	8
2	5	2	9	3	8	6	7	4

**a**

÷	70	90	20	80	30	50	60	40
10								

**b**

÷	15	30	35	25	10	45	20	40
5								

**c**

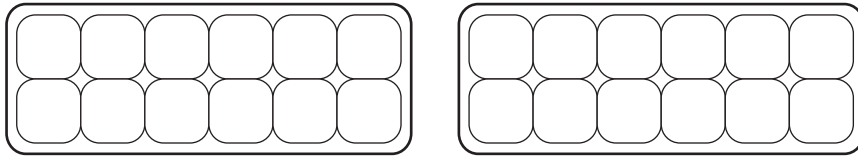
÷	8	20	16	36	24	28	12	32
4								

NAME \_\_\_\_\_

DATE \_\_\_\_\_

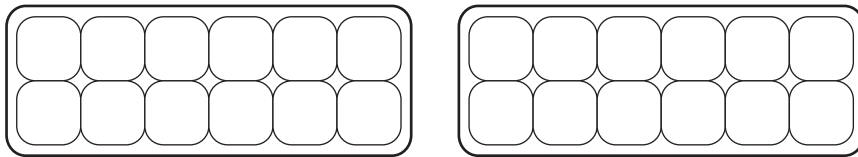
# Dividing an Egg Carton

Use yarn or string to divide your carton into 2 equal parts.



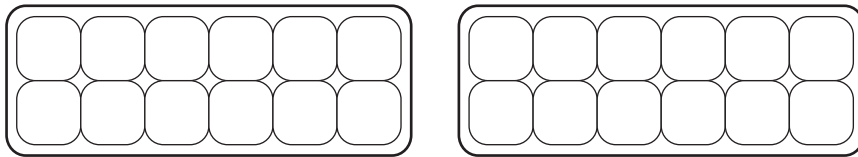
Name of Each Part	Number of Eggs

Use yarn or string to divide your carton into 3 equal parts.



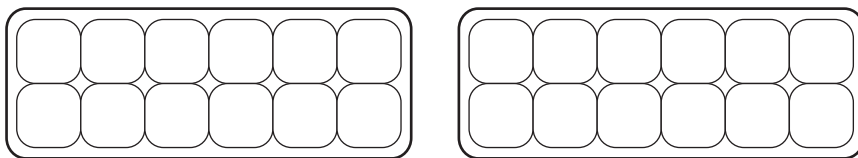
Name of Each Part	Number of Eggs

Use yarn or string to divide your carton into 4 equal parts.



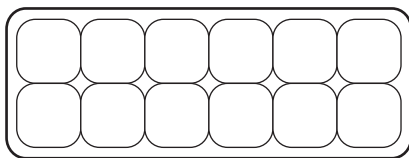
Name of Each Part	Number of Eggs

Use yarn or string to divide your carton into 6 equal parts.



Name of Each Part	Number of Eggs

Use yarn or string to divide your carton into 12 equal parts.



Name of Each Part	Number of Eggs

NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Egg Carton Recording Paper




























NAME \_\_\_\_\_

DATE \_\_\_\_\_

# Comparing Fractions

## Challenge

**1** In the boxes below, list the fractions you just modeled in order from least to greatest.

--	--	--	--	--	--	--	--

**2** Find a partner to work with. For each pair of fractions below, talk about which is larger and why. You can use the egg cartons to model and compare the fractions, but try to see if you can picture them in your head and reason about which must be larger.

<p><b>a</b> <math>\frac{1}{3}</math> <math>\frac{3}{12}</math></p>		
<p><b>b</b> <math>\frac{7}{12}</math> <math>\frac{2}{3}</math></p>		
<p><b>c</b> <math>\frac{3}{4}</math> <math>\frac{2}{3}</math></p>		
<p><b>d</b> <math>\frac{1}{2}</math> <math>\frac{5}{12}</math></p>		
<p><b>e</b> <math>\frac{5}{12}</math> <math>\frac{1}{3}</math></p>		



# Modeling Egg Carton Fractions

**1** Use your egg carton diagram, string, and tiles to build a model of each fraction. Then draw a sketch of each fraction in the tables.

Build this fraction.	Sketch your model here.	Build this fraction.	Sketch your model here.
<b>ex</b> $\frac{1}{3}$		<b>a</b> $\frac{1}{4}$	
<b>b</b> $\frac{2}{3}$		<b>c</b> $\frac{3}{12}$	
<b>d</b> $\frac{2}{4}$		<b>e</b> $\frac{5}{6}$	
<b>f</b> $\frac{2}{6}$		<b>g</b> $\frac{10}{12}$	
<b>h</b> $\frac{5}{12}$		<b>i</b> $\frac{3}{6}$	

**2** What observations can you make about  $\frac{3}{6}$  and  $\frac{2}{4}$ ?

**3** Which is more,  $\frac{1}{4}$  of a dozen or  $\frac{1}{3}$  of a dozen? \_\_\_\_\_

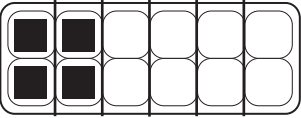
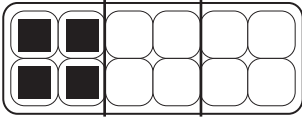
**a** How do you know?

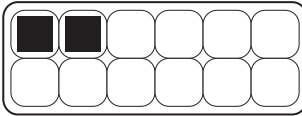
NAME \_\_\_\_\_

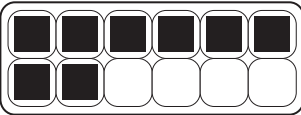
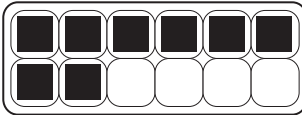
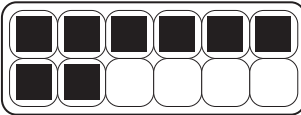
DATE \_\_\_\_\_

# Equivalent Fractions page 1 of 2

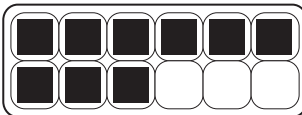
In each problem below, there are 2, 3, or even 4 identical pictures. Label each with a different fraction name, and draw in yarn lines to show your thinking. In all problems, one egg carton is always worth 1.

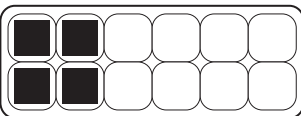
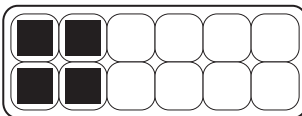
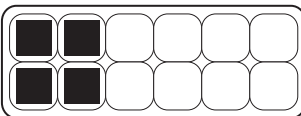
**ex**   $\frac{2}{6}$    $\frac{1}{3}$

**1**   $\frac{\quad}{\quad}$    $\frac{\quad}{\quad}$

**2**   $\frac{\quad}{\quad}$    $\frac{\quad}{\quad}$    $\frac{\quad}{\quad}$

**3**   $\frac{\quad}{\quad}$    $\frac{\quad}{\quad}$

**4**   $\frac{\quad}{\quad}$    $\frac{\quad}{\quad}$

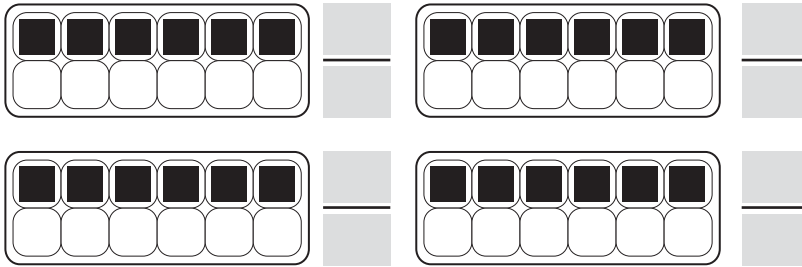
**5**   $\frac{\quad}{\quad}$    $\frac{\quad}{\quad}$    $\frac{\quad}{\quad}$

**6**   $\frac{\quad}{\quad}$    $\frac{\quad}{\quad}$

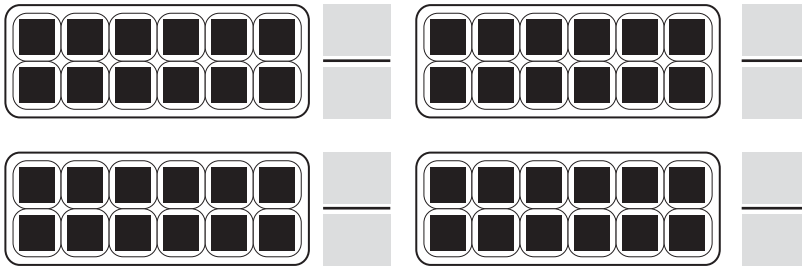
*(continued on next page)*

**Equivalent Fractions** page 2 of 2

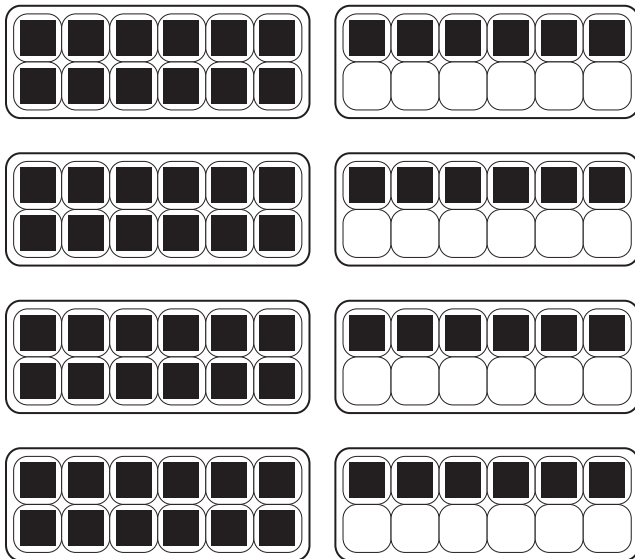
**7**



**8**



**9 CHALLENGE** Can you come up with 4 different ways to name a carton and a half of eggs? (Hint: Use mixed numbers or improper fractions.)



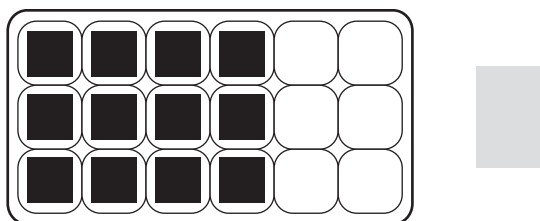

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Eggsploration Challenge

- 1 Jon's dad brought home eggs in an 18-egg carton instead of a 12-egg carton. When Jon opened the carton three days later, there were only 12 eggs left in the carton. What fraction of the carton was still filled? Be sure to draw in the lines for string or yarn to show the number of equal parts into which you're dividing the carton.



- 2 Figure out two other names for the fraction of the carton filled by 12 eggs. Be sure to draw in the lines for string or yarn to show the number of equal parts into which you're dividing the carton.



- 3 On a 12-egg carton,  $\frac{1}{6}$  is 2 eggs. On the grid below, sketch 4 different cartons, in which:

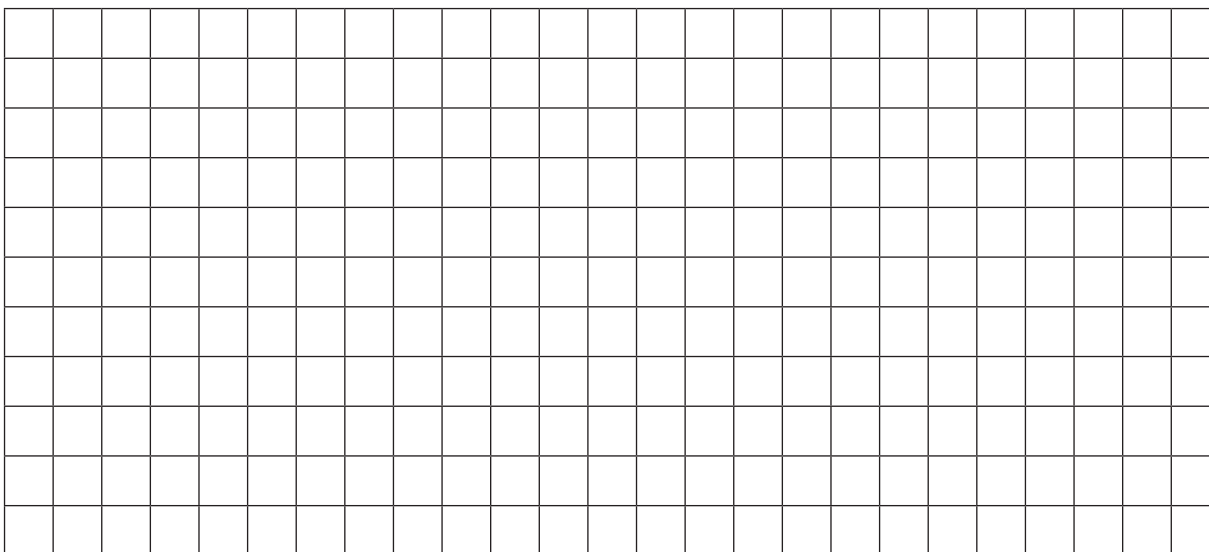
**a**  $\frac{1}{6}$  is 2 eggs

**b**  $\frac{1}{6}$  is 4 eggs

**c**  $\frac{1}{6}$  is 6 eggs

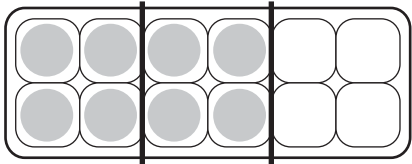
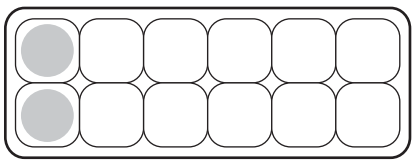
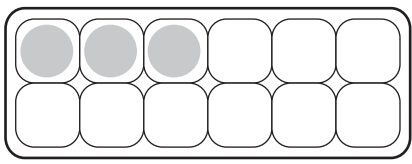
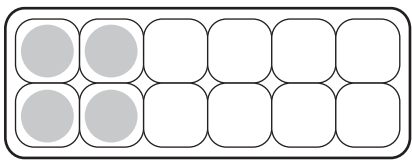
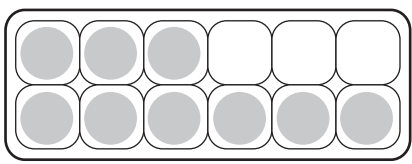
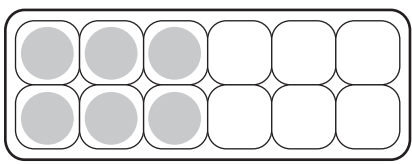
**d**  $\frac{5}{6}$  is 5 eggs

On each carton you sketch, be sure to show the eggs and the yarn lines. Also, label each sketch with its letter.

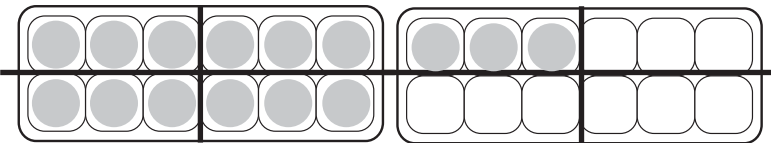
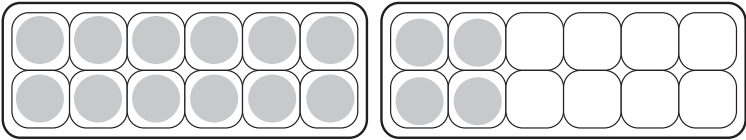
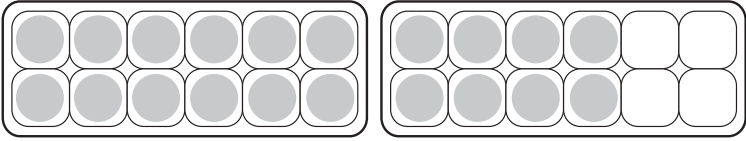


# More Egg Carton Fractions

**1** Write at least two fractions to show the part of each egg carton that is filled. Draw lines on the egg cartons to divide them into equal parts.

<b>ex</b> 	<b>a</b> 
$\frac{2}{3}$ $\frac{4}{6}$	
<b>b</b> 	<b>c</b> 
<b>d</b> 	<b>e</b> 

**2** Fractions can be greater than 1. If a fraction greater than 1 is written as a whole number with a fraction, it is called a mixed number. If it is written as a fraction, it is called an improper fraction. Draw on the egg cartons to divide them into equal parts. Then write a mixed number and an improper fraction to show how many full egg cartons are shown.

Egg Carton	Mixed Fraction	Improper Fraction
<b>ex</b> 	$1\frac{1}{4}$	$\frac{5}{4}$
<b>a</b> 		
<b>b</b> 		

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Pizza Party Planning

A fourth grade class won a pizza party for collecting the most paper for recycling in their school contest. Medium pizzas were cut into 8 slices, and large pizzas were cut into 12 slices.

- 1 Mariah ate 2 slices of a large pizza. What fraction of the pizza did she eat? Draw a sketch to show your thinking.
  
- 2 Carlos said that Mariah ate of  $\frac{1}{6}$  a pizza. Tell why you agree or disagree.
  
- 3 Mariah's table seats 4 students. Each student ate 2 slices of a large pizza. Write an equation that shows what fraction of a pizza was eaten at Mariah's table.
  
- 4 Tony ate 3 slices of a medium pizza. His friend, Connor, ate 4 slices of the same pizza.
  - a Write two different fractions to describe how much pizza Connor ate.
  
  - b What fraction of the pizza did the boys eat together? \_\_\_\_\_
  
- 5 Lionel's table group drank  $1\frac{1}{2}$  liters of juice with their pizza. How many milliliters did they drink? Show your work.
  
- 6 Complete the problems.
 

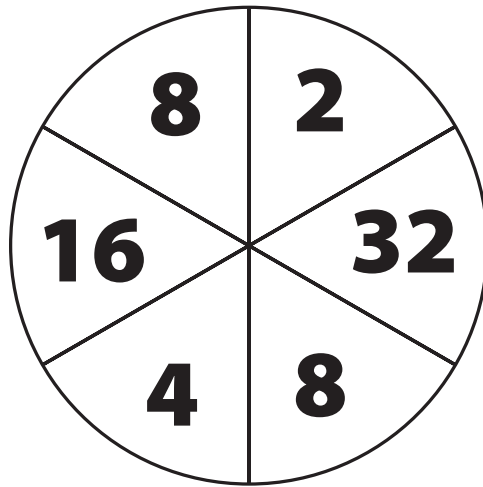
$\begin{array}{r} 100 \\ \times 45 \\ \hline \square \end{array}$	$\begin{array}{r} 79 \\ \times 10 \\ \hline \square \end{array}$	$\begin{array}{r} 100 \\ \times \square \\ \hline 8,500 \end{array}$	$\begin{array}{r} 20 \\ \times \square \\ \hline 1,400 \end{array}$	$\begin{array}{r} \square \\ \times 40 \\ \hline 240 \end{array}$	$\begin{array}{r} \square \\ \times \square \\ \hline 7,000 \end{array}$	$\begin{array}{r} 60 \\ \times 60 \\ \hline \square \end{array}$
---	--	--	---	---	--	--

NAME \_\_\_\_\_

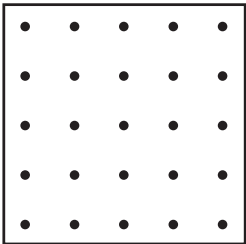
DATE \_\_\_\_\_

 **Last Equation Wins** page 1 of 2

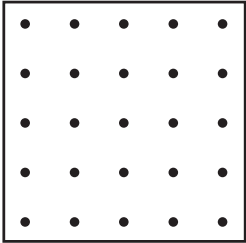
Player 1 \_\_\_\_\_ Player 2 \_\_\_\_\_



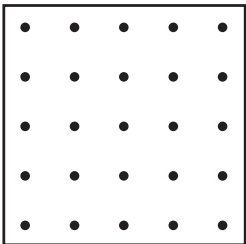
**Round 1**

		
	Our fraction is: _____	

**Round 2**

		
	Our fraction is: _____	

**Round 3**

		
	Our fraction is: _____	

*(continued on next page)*

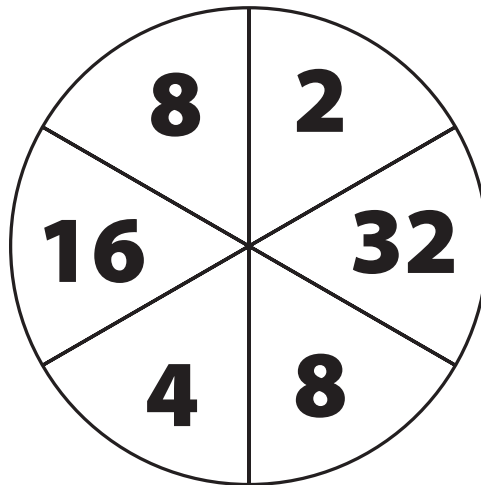


NAME \_\_\_\_\_

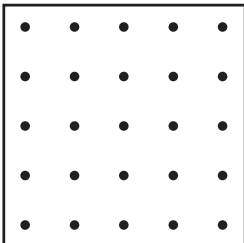
DATE \_\_\_\_\_

**Last Equation Wins** page 2 of 2

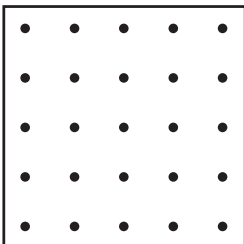
Player 1 \_\_\_\_\_ Player 2 \_\_\_\_\_



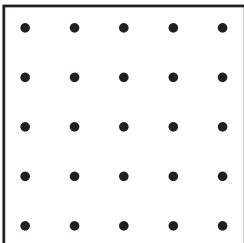
**Round 1**

		
	Our fraction is: _____	

**Round 2**

		
	Our fraction is: _____	

**Round 3**

		
	Our fraction is: _____	

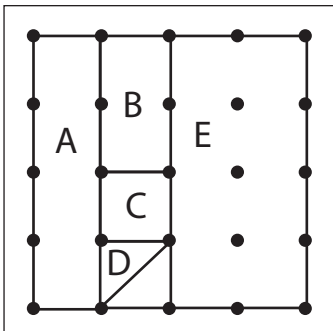
NAME \_\_\_\_\_

DATE \_\_\_\_\_



# What's the Share?

1 If the area of the largest square on the geoboard is 1, what is the area of each region?



<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
----------	----------	----------	----------	----------

2 Write four statements and matching fraction equations that compare two regions.

Statements	Equations
<b>ex</b> A is half of E	$2 \times \frac{1}{4} = \frac{1}{2}$

3 Fill in the blank with the correct relational symbol: <, >, or =.

$\frac{1}{2}$ <input type="text"/> $\frac{1}{6}$	$\frac{3}{4}$ <input type="text"/> $\frac{3}{8}$	$\frac{4}{9}$ <input type="text"/> $\frac{6}{9}$	$\frac{4}{8}$ <input type="text"/> $\frac{5}{10}$
--	--	--	---

4 List all the factor pairs for the number 32.

5 List three prime numbers greater than 20.



# Comparing, Adding & Subtracting Fractions page 1 of 2

**1** Use the symbols  $>$ ,  $=$ , or  $<$  to compare each pair of fractions.

$\frac{3}{8}$ <input type="text"/> $\frac{2}{8}$	$\frac{3}{8}$ <input type="text"/> $\frac{1}{4}$	$\frac{3}{8}$ <input type="text"/> $\frac{7}{16}$	$\frac{7}{16}$ <input type="text"/> $\frac{1}{4}$
$\frac{1}{4}$ <input type="text"/> $\frac{3}{4}$	$\frac{4}{16}$ <input type="text"/> $\frac{2}{16}$	$\frac{4}{16}$ <input type="text"/> $\frac{5}{8}$	$\frac{3}{4}$ <input type="text"/> $\frac{5}{8}$

**2** Find each sum.

$\frac{1}{4} + \frac{3}{4} =$	$\frac{2}{4} + \frac{1}{4} =$	$\frac{2}{4} + \frac{3}{4} =$
$1\frac{1}{4} + \frac{1}{4} =$	$\frac{2}{8} + \frac{5}{8} =$	$\frac{5}{8} + \frac{6}{8} =$

**3** Find each difference.

$\frac{3}{4} - \frac{1}{4} =$	$1\frac{1}{4} - \frac{1}{4} =$	$1\frac{1}{4} - \frac{3}{4} =$
$\frac{6}{8} - \frac{2}{8} =$	$1\frac{3}{8} - \frac{2}{8} =$	$1\frac{3}{8} - \frac{4}{8} =$

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Comparing, Adding & Subtracting Fractions** page 2 of 2**4 CHALLENGE** Write as many equivalent fractions as you can for each fraction shown below.

<b>a</b> $\frac{1}{8}$	
<b>b</b> $\frac{1}{4}$	
<b>c</b> $\frac{2}{3}$	

**d** Describe how you can write equivalent fractions for any fraction.**5 CHALLENGE** Find each sum.

$1\frac{1}{4} + \frac{1}{2} =$	$\frac{2}{8} + \frac{3}{4} =$	$\frac{12}{16} + \frac{1}{8} =$
--------------------------------	-------------------------------	---------------------------------

**6 CHALLENGE** Find each difference.

$1\frac{1}{4} - \frac{1}{2} =$	$\frac{3}{4} - \frac{3}{8} =$	$\frac{5}{16} - \frac{1}{4} =$
--------------------------------	-------------------------------	--------------------------------



## Adding & Subtracting Fractions

Ariel got a new box of 8 crayons and a set of 10 markers for her birthday. Use this information as you solve each problem below. Use numbers, labeled sketches, or words to show your thinking.

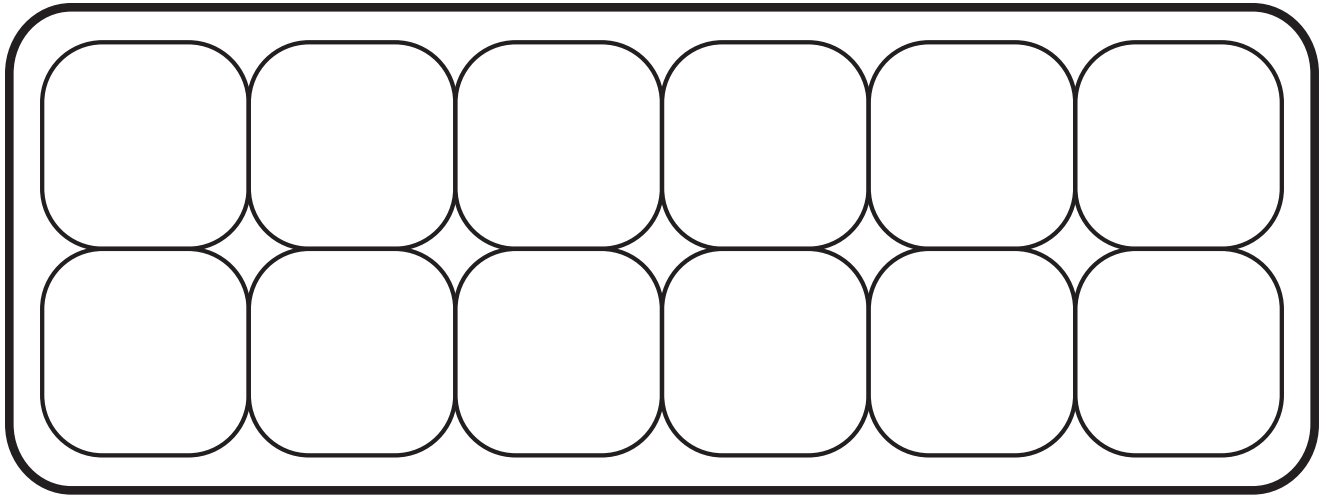
- 1** Ariel used 5 crayons to make a thank-you card. What fraction of the box did she use?
  
- 2** Ariel gave her brother 4 crayons. What fraction does she have left out of her box of 8?
  
- 3** After she gave some crayons to her brother, Ariel's dog ate 2 of her crayons.
  - a** Now what fraction does Ariel have left of her original box of 8 crayons?
  
  - b** What fraction of the crayons went to Ariel's brother and her dog?
  
- 4** Ariel took 6 markers out of her marker set. What fraction of the markers are left in the set?
  
- 5** Two of Ariel's markers are green, 2 are red, and 3 are blue. What fraction of the markers are  
green? \_\_\_\_\_  
red? \_\_\_\_\_  
blue? \_\_\_\_\_

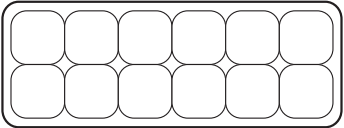
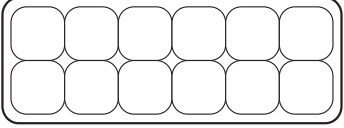
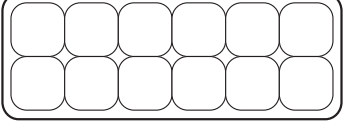
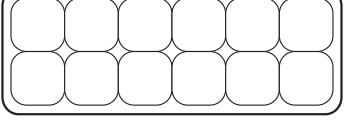
NAME \_\_\_\_\_

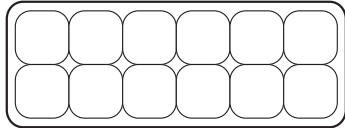
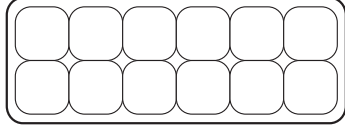
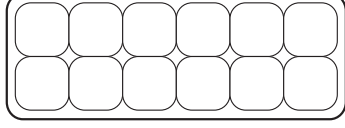
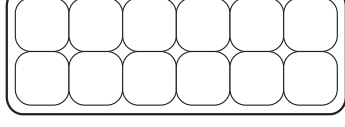
DATE \_\_\_\_\_



# Introducing Dozens of Eggs



Teacher
 <p><b>Equation:</b></p>
 <p><b>Equation:</b></p>
 <p><b>Equation:</b></p>
 <p><b>Equation:</b></p>

Students
 <p><b>Equation:</b></p>
 <p><b>Equation:</b></p>
 <p><b>Equation:</b></p>
 <p><b>Equation:</b></p>

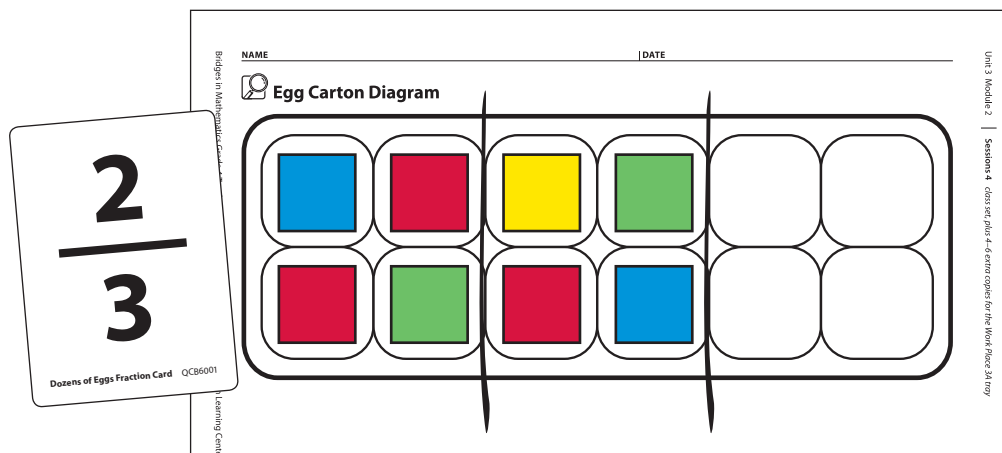


## Work Place Instructions 3A Dozens of Eggs page 1 of 2

### Each pair of players needs:

- 2 Dozens of Eggs Record Sheets
- 1 deck of Dozens of Eggs Fraction Cards
- 1 Egg Carton Diagram
- 6 pieces of string or yarn
- 12 colored tiles
- colored pencils or crayons

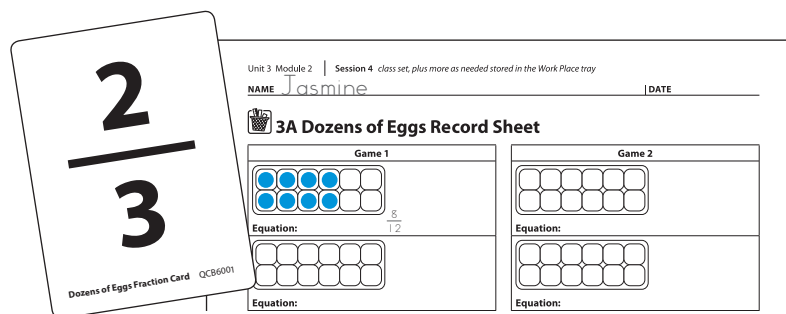
- 1 Players shuffle the fraction cards and lay them face-down in a stack. Each player draws one card. The player with the larger fraction goes first. The cards just drawn go at the bottom of the stack. Players may build fractions on the Egg Carton Diagram if needed to determine which fraction is larger.
- 2 Player 1 draws a card from the top of the deck, reads the fraction out loud, and uses string and colored tiles to build a model of the fraction on the Egg Carton Diagram. Player 2 checks Player 1's work.



*Jasmine* Wow! I got a really big fraction on my first turn. So I'm going to divide the egg carton into 3 equal parts, and fill 2 of them, like this.

*Sara* I agree that  $\frac{2}{3}$  of the egg carton is 8 eggs, because I know that there are 4 eggs in one-third of a carton.

- 3 Player 1 draws circles to represent that number of eggs in one of the diagrams on her record sheet and records that number of twelfths as a fraction on the sheet.



*Jasmine* I have to change  $\frac{2}{3}$  into twelfths, but that's easy, because each egg is one-twelfth of the carton, so I got  $\frac{8}{12}$  on my first turn. I only need 4 more twelfths to fill this carton.


(continued on next page)

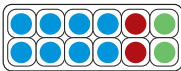
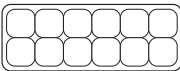
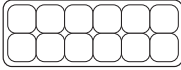
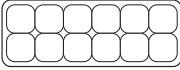
**Work Place Instructions 3A Dozens of Eggs** page 2 of 2

- 4** Player 1 empties the egg carton diagram and puts the card in a discard stack. Then Player 2 takes a turn.
- 5** Players continue to take turns until one person has filled in all four cartons on the record sheet. Players should use a different color to record each new turn.  
When all the cards in the deck have been used, shuffle the deck and use it again.
- 6** On each turn, players must put all of the eggs in one carton. However, players may begin to fill another carton before the first is completely filled.
- 7** If the fraction drawn does not fit into one of the cartons, the player misses that turn.
- 8** When a carton is filled, the player writes an equation by inserting plus signs between the fractions for that carton and showing them equal to 1 whole.

Unit 3 Module 2 | Session 4 class set, plus more as needed stored in the Work Place tray

NAME Jasmine | DATE \_\_\_\_\_

 **3A Dozens of Eggs Record Sheet**

Game 1	Game 2
	
Equation: $\frac{8}{12} + \frac{2}{12} + \frac{2}{12} = 1$	Equation: _____
	
Equation: _____	Equation: _____

- 9** The winner is the first player to fill all four cartons on his record sheet. If Player 1 is the first to fill all four cartons, Player 2 may take one last turn.

**Game Variations**

- A** Players work together to fill all four cartons on a single record sheet rather than playing against each other.
- B** Players begin with all four cartons filled, by drawing 12 circles in each of the cartons and writing  $\frac{12}{12}$  at the start of each equation line. Then each player subtracts the fractions that are written on the cards they get, crossing out that many eggs and subtracting that many twelfths. Players must subtract the entire fraction from one carton rather than splitting the fraction between two or more cartons. The winner is the first player to get rid of all the eggs from all four cartons.



NAME \_\_\_\_\_

DATE \_\_\_\_\_



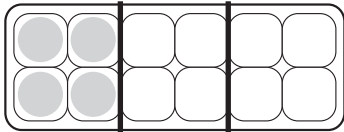
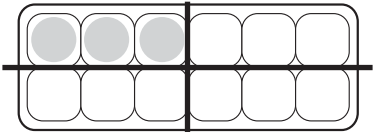
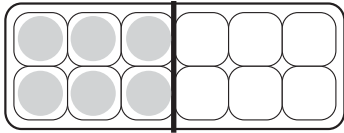
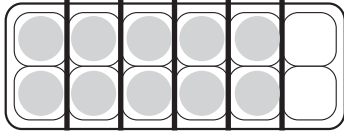
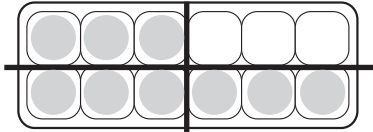
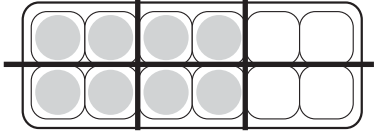
# Egg Carton Fractions

1 Solve the following multiplication and division problems. They might help you think about the egg cartons in problem 2.

$12 \div 2 = \underline{\hspace{2cm}}$        $12 \div 3 = \underline{\hspace{2cm}}$        $12 \div 4 = \underline{\hspace{2cm}}$        $12 \div 6 = \underline{\hspace{2cm}}$

$6 \times 3 = \underline{\hspace{2cm}}$        $4 \times 2 = \underline{\hspace{2cm}}$        $3 \times 3 = \underline{\hspace{2cm}}$        $2 \times 5 = \underline{\hspace{2cm}}$

2 Write a fraction to show the amount of each egg carton that is filled with eggs. (The cartons are divided into equal parts for you.) Then write an equivalent fraction with 12 in the denominator.

<p><b>ex</b></p>  <p><b>Equation:</b> <math>\frac{1}{3} = \frac{4}{12}</math></p>	<p><b>a</b></p>  <p><b>Equation:</b></p>
<p><b>b</b></p>  <p><b>Equation:</b></p>	<p><b>c</b></p>  <p><b>Equation:</b></p>
<p><b>d</b></p>  <p><b>Equation:</b></p>	<p><b>e</b></p>  <p><b>Equation:</b></p>

3 Use the symbols  $>$ ,  $=$ , or  $<$  to compare each pair of fractions.

<p><b>ex</b> <math>\frac{1}{4} &lt; \frac{1}{2}</math></p>	<p><b>ex</b> <math>\frac{1}{2} &gt; \frac{1}{3}</math></p>	<p><b>a</b> <math>\frac{4}{6} \blacksquare \frac{2}{3}</math></p>
<p><b>b</b> <math>\frac{1}{3} \blacksquare \frac{1}{4}</math></p>	<p><b>c</b> <math>\frac{3}{4} \blacksquare \frac{5}{6}</math></p>	<p><b>d</b> <math>\frac{1}{3} \blacksquare \frac{3}{4}</math></p>
<p><b>e</b> <math>\frac{1}{2} \blacksquare \frac{2}{4}</math></p>	<p><b>f</b> <math>\frac{2}{3} \blacksquare \frac{3}{4}</math></p>	<p><b>g</b> <math>\frac{2}{6} \blacksquare \frac{1}{3}</math></p>

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## How Many Candy Bars?

**1** Mrs. Wiggins is hosting her annual class picnic. She wants to give each student  $\frac{3}{4}$  of a candy bar for a dessert treat.

**a** How many candy bars will she need for two students? \_\_\_\_\_

**b** How many candy bars will she need for four students? \_\_\_\_\_

**c** In order to make things easier for Mrs. Wiggins, fill in the chart below so she will know how many candy bars she might need.

<b>Number of Candy Bars</b>								
<b>Number of Students</b>	1	2	3	4	5	6	7	8

<b>Number of Candy Bars</b>								
<b>Number of Students</b>	9	10	11	12	13	14	15	16

<b>Number of Candy Bars</b>								
<b>Number of Students</b>	17	18	19	20	21	22	23	24

<b>Number of Candy Bars</b>								
<b>Number of Students</b>	25	26	27	28	29	30	31	32

**2** How did you get your answers on the chart above? Use numbers, words, or labeled sketches to describe your strategy.

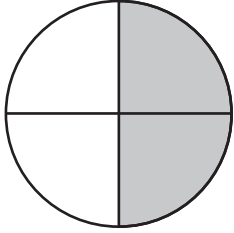
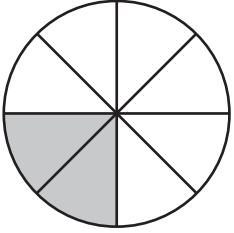
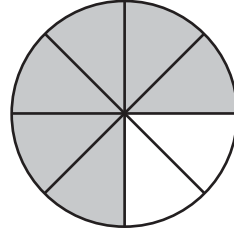
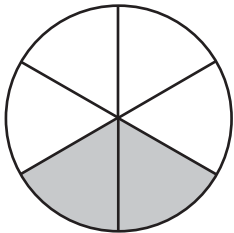
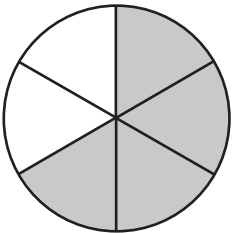
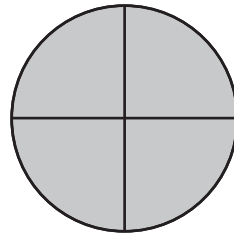
**3 CHALLENGE** What kind of general rule could you give Mrs. Wiggins to know how many candy bars to get no matter how many students she has?

NAME \_\_\_\_\_

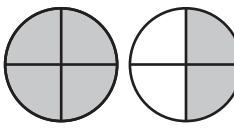
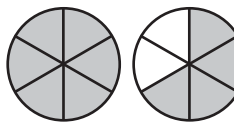
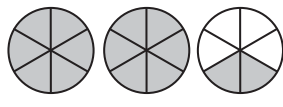
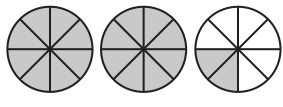
DATE \_\_\_\_\_

# Fractions & Mixed Numbers

1 The circles below are divided into equal parts. Write two fractions to show what part of each circle is filled in.

<p><b>ex</b></p>  <p style="text-align: center;"><math>\frac{1}{2}</math>   <math>\frac{2}{4}</math></p>	<p><b>a</b></p> 	<p><b>b</b></p> 
<p><b>c</b></p> 	<p><b>d</b></p> 	<p><b>e</b></p> 

2 The circles below are divided into equal parts. Write a fraction and a mixed number to show how many circles are filled in.

	Fraction	Mixed Number		Fraction	Mixed Number
<p><b>ex</b></p> 	$\frac{6}{4}$	$1 \frac{1}{2}$	<p><b>a</b></p> 		
<p><b>b</b></p> 			<p><b>c</b></p> 		

3 Fill in the missing fractions or mixed numbers.

							Challenge	
Fractions	$\frac{5}{2}$	$\frac{9}{2}$	$\frac{9}{4}$	$\frac{14}{4}$			$\frac{62}{3}$	
Mixed Numbers	$2 \frac{1}{2}$				$3 \frac{1}{2}$	$2 \frac{3}{4}$		$30 \frac{1}{3}$



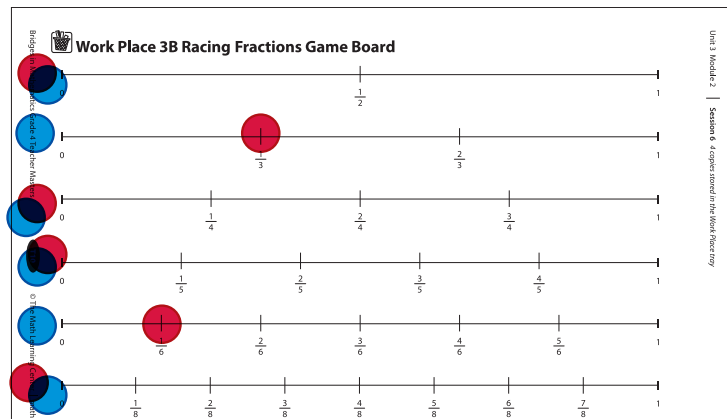
## Work Place Instructions 3B Racing Fractions

### Each pair of players needs:

- 1 Racing Fractions Record Sheet to share
- 1 Racing Fractions Game Board
- 7 red game markers
- 7 blue game markers
- 1 deck of Racing Fraction Cards

- 1 Players decide who will play with the red game markers, and who will play with the blue markers. Then both players place one of their game markers at the beginning of each number line on the game board.
- 2 Players shuffle the fraction cards and lay them face-down in a stack. Each player draws one card. The player with the larger fraction goes first. Players put the cards just drawn at the bottom of the stack.
- 3 Player 1 draws a new card and moves one or more game markers the distance shown on the card.

*Player 1* I got  $\frac{3}{6}$ . That's the same as  $\frac{1}{2}$ , so I could go  $\frac{1}{2}$ ,  $\frac{2}{4}$ ,  $\frac{3}{6}$ ,  $\frac{4}{8}$ , or  $\frac{5}{10}$ . Hmm...or I could do  $\frac{1}{3}$  and  $\frac{1}{6}$ . I remember those make  $\frac{1}{2}$  from when we looked at egg carton fractions. I think I'll do that.



- 4 Player 1 records the fraction in his Fraction column on the record sheet and writes the fraction or equation that describes how the game markers were moved in his Equation column.  
(If the player selected  $\frac{1}{2}$  and moved  $\frac{1}{2}$ , he would write  $\frac{1}{2}$ . If the player selected  $\frac{1}{2}$  and moved one marker to  $\frac{1}{3}$  and another marker to  $\frac{1}{6}$ , he would write  $\frac{1}{3} + \frac{1}{6} = \frac{1}{2}$ .)
- 5 Player 2 checks first player's work on the record sheet. Player 1 tries again if an error was made.
- 6 Then Player 2 draws a fractions card and takes a turn. Player 1 checks the second player's work.
- 7 Players continue to take turns, record moves, and check each other's work until one player's game markers are all on 1. If Player 1 is the first to land on 1, Player 2 may take one last turn.

If a player cannot find a possible move for a card he has drawn, the player loses the turn.

Players may also move game markers backward. For example, if a player selects  $\frac{1}{3}$ , she can move one marker up  $\frac{1}{3}$  and another back  $\frac{1}{6}$ . The sum or the difference of the moves still needs to equal the value on the fraction card.

### Game Variations

- A Play cooperatively. Players can work together and help each other finish the track in a certain time period.
- B Double the length of each track by taping 2 copies of the Racing Fractions Game Board Teacher Master together, writing a 1 in front of every fraction on the second sheet, and changing the 1 at the end of each track on the second sheet to a 2.



## Understanding Fractions & Mixed Numbers

**1** Sketch and label a picture that represents  $1\frac{1}{2}$ .

**2** Answer each question below:

**a** How many halves are in  $\frac{3}{2}$ ? \_\_\_\_\_

**b** How many fourths are in  $\frac{7}{4}$ ? \_\_\_\_\_

**c** How many thirds are in  $\frac{8}{3}$ ? \_\_\_\_\_

**d** How many fifths are in  $\frac{6}{5}$ ? \_\_\_\_\_

**e** What do you notice about problems a–d?

**3** Write each fraction as a mixed number. Make a drawing, if needed.

**a**  $\frac{5}{2} =$  \_\_\_\_\_

**b**  $\frac{7}{6} =$  \_\_\_\_\_

**c**  $\frac{4}{3} =$  \_\_\_\_\_

**d**  $\frac{12}{8} =$  \_\_\_\_\_

**4** Write each mixed number as a fraction. Make a drawing, if needed.

**a**  $1\frac{2}{3} =$  \_\_\_\_\_

**b**  $1\frac{3}{5} =$  \_\_\_\_\_

**c**  $2\frac{1}{4} =$  \_\_\_\_\_

**d**  $3\frac{1}{2} =$  \_\_\_\_\_

NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Decimals Are Fractions page 1 of 2

1 Write the decimal and fraction for each collection in the table below.

	Collection	Decimal	Fraction
<b>a</b>			
<b>b</b>			
<b>c</b>			
<b>d</b>			

2 Sketch base ten pieces to show the minimal collection for each decimal. Then, write the number as a fraction. (A minimal collection is one that uses the fewest possible number of pieces.)

	Decimal	Collection	Fraction
<b>a</b>	0.75		
<b>b</b>	0.25		
<b>c</b>	1.99		
<b>d</b>	2.03		

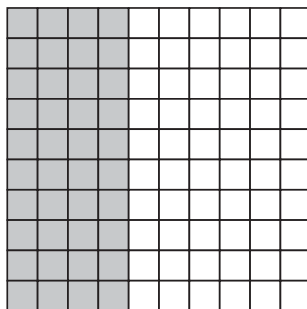
(continued on next page)

**Decimals Are Fractions** page 2 of 2

- 3** Write the numbers 0.75, 0.25, 1.99, and 2.03 in their approximate places on the number line below.



- 4** The value of the mat is 1.



- a** How many tenths are shaded on the mat?
- b** How many hundredths are shaded on the mat? How do you know?
- c** Write two fraction names for the shaded amount.
- d** Write two decimal names for the shaded amount.
- 5** Use numbers, words, or sketches to record at least two different observations about decimals and fractions.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



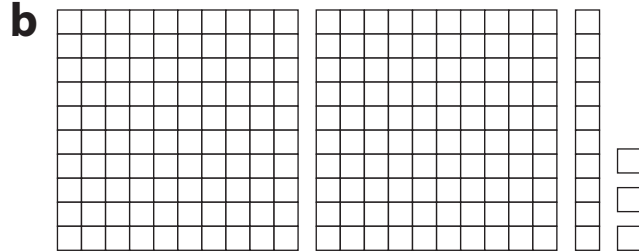
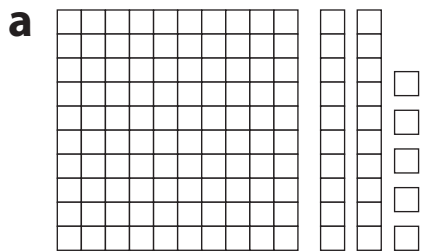
## Money, Decimals & Fractions

**1** Sketch base ten pieces to show the value of each number.

**a** 3.18

**b** 4.68

**2** Write a decimal number for each collection of base ten area pieces below.



**3** Fill in the table to show each value as money, a decimal, or a fraction.

Money	Decimal	Fraction
\$5.26	5.26	$5\frac{26}{100}$
	4.08	
		$2\frac{39}{100}$
\$8.40		
		$1\frac{6}{10}$

**4** Write this number as a decimal: one and fifty-six hundredths.

**5** Write this decimal number in words: 2.94.





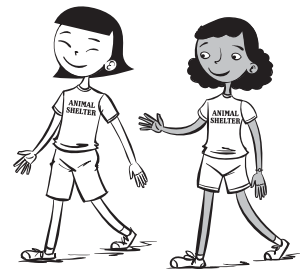
## Comparing Decimals & Fractions page 1 of 2

For all questions below, write an inequality using the symbols  $<$  or  $>$  to show your answer.

- 1** Two baby hummingbirds hatched last week at the zoo. A researcher is keeping track of their weights. Today Baby A weighs 1.2 grams and Baby B weighs 1.09 grams. Which is heavier, Baby A or Baby B?



- 2** Rosario and her friend Keiko walked in the walkathon to benefit the animal shelter. Rosario walked 3.41 miles, and Keiko walked 3.8 miles. Who walked farther?



- 3** A giant panda at the Beijing Zoo in China had twins named Lucy and Lei. Giant pandas can weigh over 200 pounds when fully grown, but they have very tiny babies. When they were born, Lei weighed 5.29 ounces and Lucy weighed 5.9 ounces. Which twin was heavier?



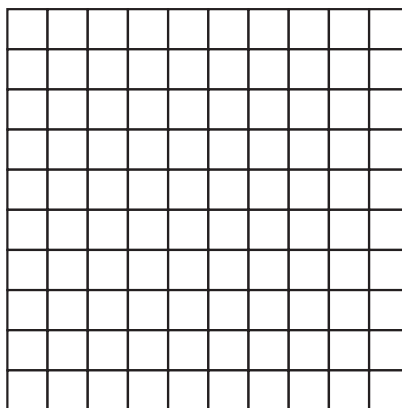
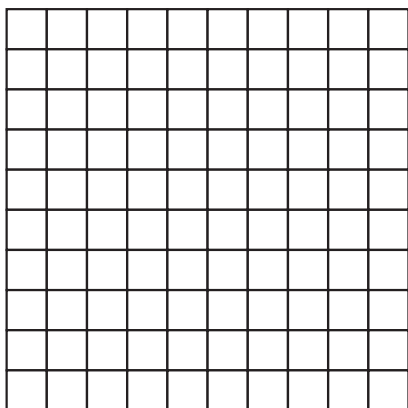
*(continued on next page)*

**Comparing Decimals & Fractions** page 2 of 2

**4** Which fraction is larger:  $\frac{6}{10}$  or  $\frac{49}{100}$ ?

**a** Explain why you think so.

**b** Draw each fraction on a grid below to verify your answer.

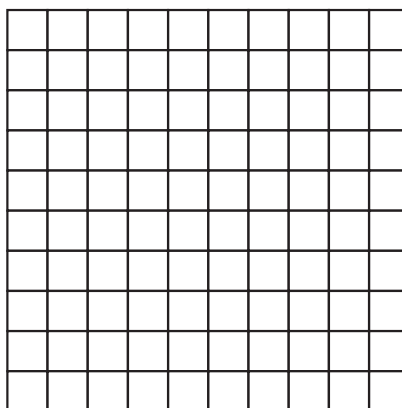
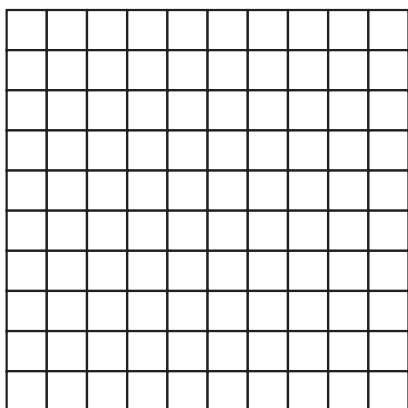


**c** Record each fraction as a decimal number.

$$\frac{6}{10} =$$

$$\frac{49}{100} =$$

**5 a** On each grid below: shade in and label a different number between 0.45 and 0.5.



**b** Compare the numbers. Write an inequality using the symbol  $<$  or  $>$  to show which number is larger.



## Number Riddles

**1** Draw a line to show which number matches each description. This first one has been done for you as an example.

- |           |  |        |
|-----------|--|--------|
| <b>ex</b> | This number has a 2 in the thousands place.                      | 58,252 |
| <b>a</b>  | This number has a 5 in the tenths place.                         | 6.37   |
| <b>b</b>  | This number is even and has an 8 in the thousands place.         | 8,711  |
| <b>c</b>  | This number is less than 10 and has a 7 in the hundredths place. | 62,189 |
| <b>d</b>  | This number is odd and has a 7 in the hundreds place.            | 800.51 |

**2** Write each number in words.

**a** 1.89

**b** 2.03

**c** Use a symbol ( $<$ ,  $>$ ,  $=$ ) to compare these numbers: 1.89 \_\_\_\_\_ 2.03.

**3** Write each number as a decimal and a mixed number:

**a** Three and eighty-three hundredths \_\_\_\_\_

**b** Four and six hundredths \_\_\_\_\_

**c** Use a symbol ( $<$ ,  $>$ ,  $=$ ) to compare the two numbers in 3a and 3b.

\_\_\_\_\_

**4** **CHALLENGE** Write an even number that has a 7 in the hundreds place, an odd number in the thousands place, and is a multiple of 10.



# Work Place Instructions 3C Decimal Four Spins to Win

## Each pair of players needs:

- 2 Decimal Four Spins to Win Record Sheets
- 1 set of base ten area pieces
- 1 spinner overlay
- colored pencils or crayons in several different colors

**1** Players spin the second (hundredths) spinner on the record sheet. The player with the larger fraction goes first.

**2** Player 1 spins both spinners and records the results in his Spin 1 box. Then he:

- Rewrites the first fraction as an equivalent fraction with denominator 100
- Adds the two fractions
- Shows the answer as a fraction and as a decimal
- Colors in the first grid to show the results of his spin

*Pedro* OK, I got  $\frac{2}{10}$  and  $\frac{49}{100}$ . I know  $\frac{2}{10}$  is the same as  $\frac{20}{100}$ , so I'll write that and add my fractions. It's  $\frac{69}{100}$  in all. Now I have to color in the first grid to show what I got.

**3** Player 2 takes a turn to spin, record, add, and color in the results on her record sheet.

**4** Players take turns until they have each had 4 turns.

- Players must be sure to use a different color to shade in their grids each time they take a turn.
- It's OK to go over 3.00. (That's what the 3 extra tenths at the end of row of grids are for; don't use them unless you have to.)

**5** After each player has taken four turns, they each find their total and record it on their sheet.

**Note** It's a very good idea to double-check the totals. If a player found the total by looking at her grids, she should also use the work space on her sheet to add the four decimal numbers. (It's fine to use the base ten pieces to help add these numbers.)

**6** Players each record their partner's total, compare the two, and circle the total that's closer to 3.00, either under or over.

## Game Variation

**A** Players work together, using one record sheet, to see how close they can come to 3.00, instead of playing competitively. (They can play the game twice and see if they can get closer to 3.00 the second time.)

**B** Players use the rule that they can't go over 3.00. If they play using this variation, they don't have to take all 4 turns. They can decide to hold at 3 turns if it looks like a fourth turn might take them over 3.00. This variation is scored the same way as the regular version—players find their totals, and the score closer to 3.00 wins.

Unit 3 Module 3 | Session 2 2 class sets, plus more as needed, stored in the Work Place tray

NAME \_\_\_\_\_ | DATE \_\_\_\_\_

**3C Decimal Four Spins to Win**

+

	Work Space	
Spin 1	$\frac{2}{10} + \frac{49}{100} = \frac{20}{100} + \frac{49}{100} = \frac{69}{100}$ or 0. <u>69</u>	
Spin 2	$\frac{1}{10} + \frac{1}{100} = \frac{10}{100} + \frac{1}{100} = \frac{11}{100}$ or 0. _____	
Spin 3	$\frac{1}{10} + \frac{1}{100} = \frac{10}{100} + \frac{1}{100} = \frac{11}{100}$ or 0. _____	
Spin 4	$\frac{1}{10} + \frac{1}{100} = \frac{10}{100} + \frac{1}{100} = \frac{11}{100}$ or 0. _____	

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Tenths & Hundredths

- 1 Each grid below has a value of 1.0. Write two fractions and two decimals to show the amount shaded in on each.

		Fractions	Decimals
<b>ex</b>		$\frac{4}{10}$ $\frac{40}{100}$	0.4   0.40
<b>a</b>			
<b>b</b>			
<b>c</b>			

- 2 Rewrite each fraction as an equivalent fraction with denominator 100. (The first one is done for you.)

$$\frac{2}{10} = \frac{20}{100}$$

$$\frac{9}{10} =$$

$$\frac{1}{10} =$$

$$\frac{8}{10} =$$

$$\frac{5}{10} =$$

- 3 Add these pairs of fractions. Express the answer for each as a fraction with denominator 100.

$$\frac{2}{10} + \frac{35}{100} =$$

$$\frac{9}{10} + \frac{6}{100} =$$

$$\frac{1}{10} + \frac{89}{100} =$$

$$\frac{8}{10} + \frac{13}{100} =$$



## Work Place Instructions 3D Decimal More or Less

### Each pair of players needs:

- 2 Decimal More or Less Record Sheets
- 2 sets of base ten area pieces
- 1 spinner overlay
- 1 more/less die

- 1 Players roll the more/less die to determine whether they will play for more or less in the first round. They circle the word *more* or *less* on their record sheets to show.
- 2 Players spin the Decimal More or Less Spinner. The player with the larger number goes first.
- 3 Player 1 spins the spinner and decides whether to place the number in the ones, tenths, or hundredths place. Both players write Player 1's number on their record sheets.  
**Note** Once a number has been placed, it cannot be moved.
- 4 Then Player 1 sets out base ten area pieces to show the value of the number spun.

Unit 3 Module 3 | Session 4 2 class sets, plus more as needed stored in the Work Place tray

NAME Antoine | DATE \_\_\_\_\_

3D Decimal More or Less Record Sheet

Example	
We played for (circle one)	<input checked="" type="radio"/> more <input type="radio"/> less
Player 1	$4 + .3 + .01 = 4.31$
Player 2	$3 + .2 + .01 = 3.21$
The winner won by <u>1</u> <u>1</u> <u>0</u>	

Round 1	Round 2
We played for (circle one) <input checked="" type="radio"/> more <input type="radio"/> less	We played for (circle one) <input type="radio"/> more <input type="radio"/> less
Player 1 $4 + .0 + .0 = 4.00$	Player 1 $___ + .___ + .0 = ___$

*Antoine I got a 4, so I put it in the tenths place. We're playing for more, so I could still get a 5 to put in the ones place. I put out 4 strips to show four-tenths.*

- 5 Players take turns until they have each taken 3 spins. After each spin, the player decides where to place the new number and sets out base ten area pieces to show the value of the number.
- 6 After each player has taken three turns, players find the sum of their numbers and record it on their sheets.
- 7 Players read their numbers aloud and compare them.
- 8 Depending on what was rolled at the beginning of the round, the player with the higher or lower sum wins that round. Both players mark the winner for the round on their record sheets.
- 9 Players start the next round by rolling the more/less die again, and continue playing until they have completed all four rounds on the sheet.

### Game Variation

- A Players determine how much the winner won by each time and use the difference between the numbers as a score. After four rounds, players add their scores and then roll the more/less die to determine the overall winner.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Decimal More or Less Challenges

- 1** Allen played Decimal More or Less with the record sheet below. He spun a 1 on his second turn. Where should Allen place the 1? Explain your thinking.

Round 1		
We played for (circle one)	<input checked="" type="radio"/> more	<input type="radio"/> less
<b>Player 1</b>		
5 . ____ + . ____ 0 ____ = ____ . ____ ____		
<b>Player 2</b>		
____ + . ____ + . ____ 0 ____ = ____ . ____ ____		
The winner won by ____ . ____ ____		

- 2** Kathy (Player 1) and Logan (Player 2) played Decimal More or Less with the record sheet below. Who won? By how much? Show your work.

Round 1		
We played for (circle one)	<input type="radio"/> more	<input checked="" type="radio"/> less
<b>Player 1</b>		
1 . 3 ____ + . ____ 0 ____ 5 = 1 . 3 5		
<b>Player 2</b>		
3 . 2 ____ + . ____ 0 ____ 5 = 3 . 2 5		
The winner won by ____ . ____ ____		

- 3** Fill in the blanks with the correct symbols. (< , > , =)
- a** 3 km \_\_\_\_ 3000 m      **b** 1.5 ml \_\_\_\_ 1500 l      **c** 10.4 \_\_\_\_ 10.09

- 4** Here is part of a ratio table Becky made. Use it to answer the following questions:

12	13	14	15	16	17	18	19
156	169	182	195	208	221	234	247

- a** What number is Becky counting by? \_\_\_\_\_
- b** What will be the 24th number on Becky's table? \_\_\_\_\_
- c** What will be the 30th number on Becky's table? \_\_\_\_\_

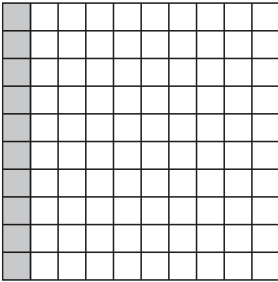
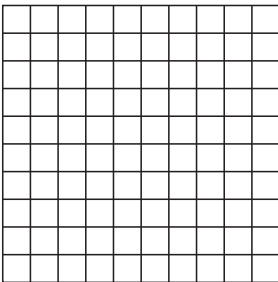
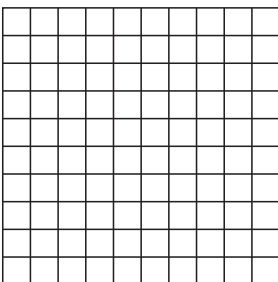
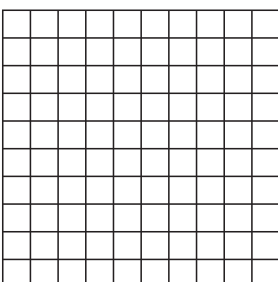
NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Decimal & Fraction Relationships page 1 of 2

For each fraction below, use base ten pieces to find another fraction name and a decimal name that mean the same amount. Then sketch on the grid to prove you are correct. Be sure to label your sketches with numbers or words.

Fraction	Another Fraction	Decimal	Use the grid to show the fractions and decimals you named are equal.
<b>ex</b>  $\frac{1}{10}$	$\frac{10}{100}$	0.1	 <p>This is 10 hundredths and it also is 1 out of 10 columns.</p>
<b>1</b>  $\frac{1}{2}$			
<b>2</b>  $\frac{1}{4}$			
<b>3</b>  $\frac{3}{4}$			

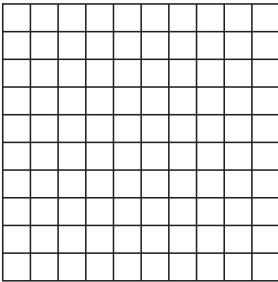
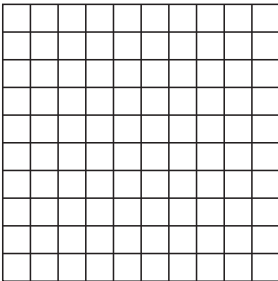
(continued on next page)



NAME \_\_\_\_\_

DATE \_\_\_\_\_

### Decimal & Fraction Relationships page 2 of 2

Fraction	Another Fraction	Decimal	Use the grid to show the fractions and decimals you named are equal.
<p><b>4</b></p> $\frac{1}{20}$			
<p><b>5</b></p> $\frac{1}{5}$			

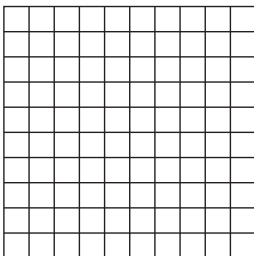
**6** Put these fractions and decimals on the number line in the correct places:

$\frac{1}{2}$     $\frac{1}{4}$     $\frac{2}{4}$     $\frac{3}{4}$     $\frac{1}{10}$     $\frac{1}{5}$     $\frac{1}{8}$    0.5   0.25   0.75



### Challenge

Hint: If you divide the 10-by-10 grid into 8 equal parts, how many hundredths are in each part?

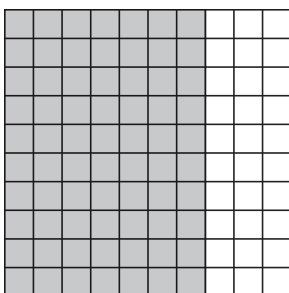
Fraction	Another Fraction	Decimal	Use the grid to show the fractions and decimals you named are equal.
<p><b>7</b></p> $\frac{1}{8}$			

NAME \_\_\_\_\_

DATE \_\_\_\_\_

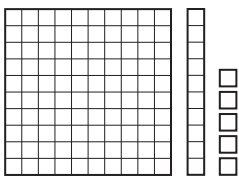
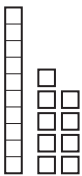
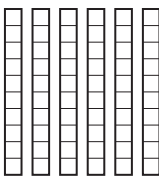
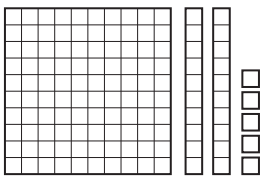
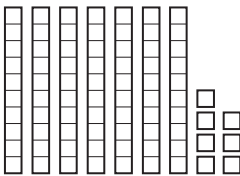
# Decimals Are Fractions

**1** This large square represents 1 unit.



- a** How many tenths are shaded? \_\_\_\_\_
- b** How many hundredths are shaded? \_\_\_\_\_

**2** Complete the table below. As in the picture above, the large square represents 1 unit. The strip represents 1 tenth, and the smallest square represents 1 hundredth.

	Collection	Fraction	Decimal
<b>ex</b>		$1 \frac{15}{100}$	1.15
<b>b</b>			0.04
<b>d</b>			
<b>a</b>			
<b>c</b>			
<b>e</b>			

**3** Write the decimal name for each fraction.

**ex**  $3 \frac{6}{100} = 3.06$

**a**  $3 \frac{8}{10} =$

**b**  $\frac{3}{100} =$

**c**  $2 \frac{7}{10} =$

**d**  $1 \frac{2}{10} =$

**e**  $1 \frac{20}{100} =$

**f**  $2 \frac{5}{10} =$

**g**  $2 \frac{50}{100} =$



## Work Place Instructions 3E Fractions & Decimals

### Each pair of players needs:

- 2 Fractions & Decimals Record Sheets
- 1 spinner overlay
- colored pencils in several different colors

- 1 Each player spins the fraction spinner one time. The player who spins the larger fraction goes first.
- 2 Player 1 spins the fraction spinner again and reads aloud the fraction spun.
- 3 Then, Player 1 converts the fraction to a decimal and colors in the value of the decimal on the base ten mat on her record sheet.
- 4 Player 1 writes the fraction and the equivalent decimal amount on her record sheet. Player 2 also records Player 1's fraction and decimal amount on his record sheet.
- 5 Players take turns spinning and recording until one player's base ten mat is completely filled. Players should use a different color to record the results of each turn on their base ten mats.

Unit 3 Module 4 | Session 2 2 class sets run double-sided, plus more as needed, stored in the Work Place tray

NAME \_\_\_\_\_ DATE \_\_\_\_\_

### 3E Fractions & Decimals Record Sheet

My Score		My Partner's Score	
Fraction	Decimal Amount	Fraction	Decimal Amount
$\frac{1}{5}$	0.2	$\frac{1}{10}$	0.1
$\frac{1}{4}$	0.25	$\frac{1}{2}$	0.50
$\frac{1}{20}$	0.05		

*Kyson* OK, Sara, it's your turn. I'm up to half the mat now—five-tenths. You're one-tenth ahead of me. I just hope you don't get a very big fraction this time!

- 6 If Player 1 is the first to reach or exceed 1.00, Player 2 may take one last turn.  
**Note** Going over 1.00 is allowed.
- 7 Each player adds up all his decimals and records the total in the decimal column of his record sheet.
- 8 The player whose total is closest to 1.00, either over or under, wins. Players circle the winner on their record sheets.

### Game Variations

- A The winning player must land exactly on 1.00. Going over 1.00 is not allowed. Turns that would make the total exceed 1.00 are skipped.
- B The target total changes to 2.00. Players need to draw another  $10 \times 10$  grid on graph paper for recording the second 1.00.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Using Pictures to Compare Decimals & Fractions

Each grid below is divided into 100 equal squares. Fill in squares to show a picture of each decimal number. Then compare the decimal number to certain fractions using  $<$ ,  $>$  or  $=$ .

Decimal Number	Picture	Compare the decimal number to these fractions.
<b>ex</b> 0.3		$0.3 > \frac{1}{4}$ $0.3 < \frac{1}{2}$ $0.3 < \frac{3}{4}$
<b>a</b> 0.46		$0.46 \square \frac{1}{4}$ $0.46 \square \frac{1}{2}$ $0.46 \square \frac{3}{4}$
<b>b</b> 0.52		$0.52 \square \frac{1}{4}$ $0.52 \square \frac{1}{2}$ $0.52 \square \frac{3}{4}$
<b>c</b> 0.87		$0.87 \square \frac{1}{4}$ $0.87 \square \frac{1}{2}$ $0.87 \square \frac{3}{4}$

NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Ordering Decimals & Fractions

1 Write the decimal number that is equal to each fraction below.

<b>ex</b> $\frac{25}{100} = 0.25$	<b>a</b> $\frac{5}{10} =$	<b>b</b> $\frac{50}{100} =$	<b>c</b> $\frac{75}{100} =$
<b>d</b> $\frac{1}{4} =$	<b>e</b> $\frac{1}{2} =$	<b>f</b> $\frac{3}{4} =$	<b>g</b> $\frac{10}{10} =$

2 Write each decimal number in the box where it belongs.

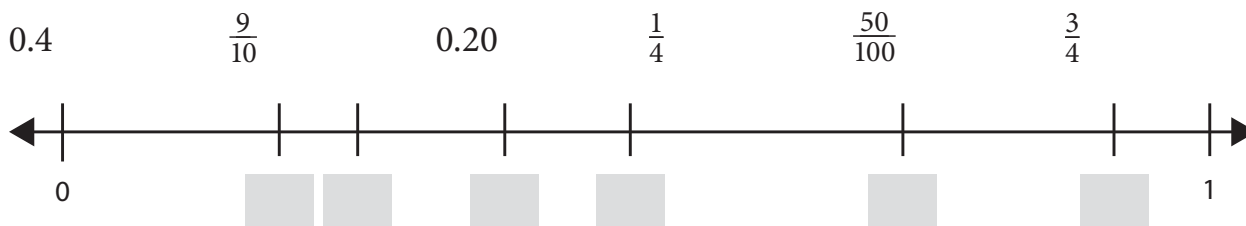
0.28      0.06      0.92      0.3      0.8      0.6      0.15      0.71

less than $\frac{1}{4}$	between $\frac{1}{4}$ and $\frac{1}{2}$	between $\frac{1}{2}$ and $\frac{3}{4}$	greater than $\frac{3}{4}$

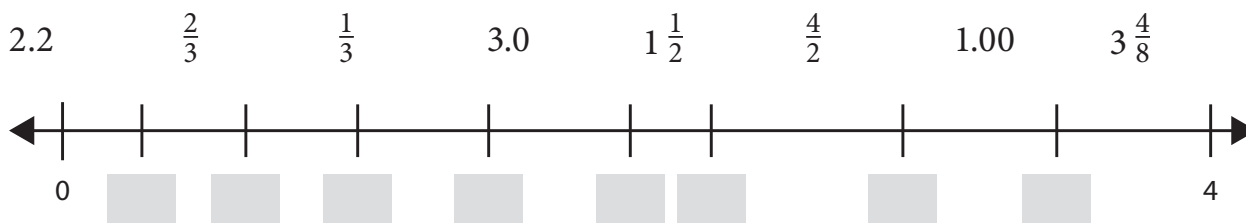
a Write the decimal numbers above in order from least to greatest.

\_\_\_\_\_ least \_\_\_\_\_ greatest

3 Put the fractions and decimal numbers in the correct places on the number line.



4 Put the fractions, mixed numbers, and decimal numbers in the correct places on the number line.





## Jared's Problems

- 1** Jared has 3 cookies to share among 5 friends. He says he can divide each cookie into 5 equal parts and give 1 part of each cookie to each friend, and then everyone will have the same amount. Make a labeled sketch to show how much each of the 5 friends will get.

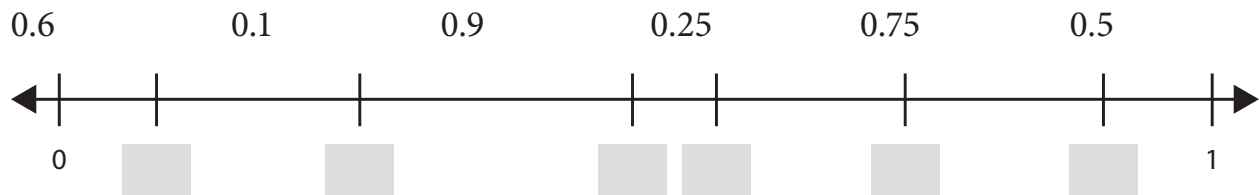
- 2** Which equation describes Jared's thinking? Fill in the bubble to show.

$\frac{1}{5} \times \frac{3}{5} = \frac{3}{5}$

$\frac{1}{5} + \frac{1}{5} + \frac{1}{5} = 3 \times \frac{1}{5} = \frac{3}{5}$

$3 + \frac{1}{5} = \frac{3}{5}$

- 3** Place the decimals in their correct places on the number line.



- 4** Fill in the blanks.

**a**  $\frac{8}{10} = \frac{\square}{100}$

**b**  $\frac{\square}{10} = \frac{30}{100}$

- 5** Write these fractions as decimals.

**a**  $\frac{35}{100} = \underline{\hspace{2cm}}$

**b**  $\frac{7}{100} = \underline{\hspace{2cm}}$



## Work Place Instructions 4A Target One Thousand

### Each pair of players needs:

- a deck of Number Cards to share
- a Target One Thousand Record Sheet for each player

- 1** One player removes the wild cards from the deck, shuffles the remaining cards well, and deals out 8 cards to each player.
- 2** Players choose 6 of their 8 cards to make two 3-digit numbers. Players try to form numbers that will total as close to 1,000 as possible, either under or over.  
(Example: If a player used the cards 1, 2, 4, 5, 6, and 8, she could make  $156 + 824 = 980$  or she could make  $156 + 842 = 998$ . She would choose  $156 + 842$  because 998 is closer to 1,000 than 980.)
- 3** Players find the sums of their numbers.
- 4** Players double-check each other's addition. When players agree on the sums, each player writes an addition equation for the chosen numbers on his record sheet.
- 5** Players figure out their scores by finding the differences between their sums and 1,000.  
(Examples: A sum of 980 has a score of 20. A sum of 1,002 has a score of 2. A sum of 1,000 has a score of 0.)
- 6** Players record both players' scores on their record sheets and put their used cards face up in a discard stack.
- 7** Then the dealer hands out 6 new cards to each player so they both have 8 cards again.
- 8** After three rounds, players add their three scores to determine the winner. The player with the lower total wins the game.

### Game Variations

- A** After players have mastered the original instructions, they can include the wild cards. A wild card can be any digit. If a player uses a wild card, he should put a star above the number made from the wild card in the equation on the record sheet.
- B** Use a different target sum, and a different number of cards. If players decide to play for 10,000, they would each get 10 cards, and use 8 of them to make two 4-digit numbers that will total as close to 10,000 as possible.



## Mixed Review

1 Sketch and label a picture that represents  $2\frac{3}{4}$ .

2 Write each fraction as a mixed number. Make a drawing, if needed.

a  $\frac{5}{2} =$  \_\_\_\_\_

b  $\frac{7}{6} =$  \_\_\_\_\_

c  $\frac{4}{3} =$  \_\_\_\_\_

d  $\frac{12}{8} =$  \_\_\_\_\_

3 Fill in the table to show each value as money, a decimal, or a fraction.

Money	Decimal	Fraction
\$4.67	4.67	$4\frac{67}{100}$
	5.29	
		$3\frac{8}{100}$
\$8.51		
		$2\frac{7}{10}$

4 Add these pairs of fractions. Express the answer for each as a fraction with denominator 100.

$$\frac{3}{10} + \frac{45}{100} =$$

$$\frac{7}{10} + \frac{63}{100} =$$

$$\frac{1}{10} + \frac{39}{100} =$$

$$\frac{4}{10} + \frac{23}{100} =$$



NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Round 'Em Up!

1 Solve the problems below. Show all your work.

$$\begin{array}{r} 324 \\ + 538 \\ \hline \end{array}$$

$$\begin{array}{r} 648 \\ + 397 \\ \hline \end{array}$$

$$\begin{array}{r} 535 \\ 202 \\ + 169 \\ \hline \end{array}$$

2 Round the numbers below to the nearest ten. When you round to the nearest ten, look at the number in the ones place. If it is 5 or higher, round up to the next highest ten. If it is less than 5, keep the number in the tens place the same.

<b>ex</b> 63    60	<b>ex</b> 186    190	<b>a</b> 47	<b>b</b> 52
<b>c</b> 35	<b>d</b> 94	<b>e</b> 122	<b>f</b> 856
<b>g</b> 267	<b>h</b> 993	<b>i</b> 1,247	<b>j</b> 2,052

3 Round the numbers below to the nearest hundred. When you round to the nearest hundred, look at the number in the tens place. If it is 5 or higher, round up to the next highest hundred. If it is less than 5, keep the number in the hundreds place the same.

<b>ex</b> 163    200	<b>ex</b> 627    600	<b>ex</b> 82    100	<b>a</b> 203
<b>b</b> 254	<b>c</b> 822	<b>d</b> 439	<b>e</b> 67
<b>f</b> 153	<b>g</b> 764	<b>h</b> 449	<b>i</b> 657

4 **CHALLENGE** Write two different numbers that round up or down to each number shown.

<b>ex</b> 400    438    384	<b>a</b> 20	<b>b</b> 80
<b>c</b> 100	<b>d</b> 300	<b>e</b> 700

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## The Dodgers & The Yankees

20,137,408 people went to see the Los Angeles Dodgers play baseball between 2001 and 2006. That's twenty million, one hundred thirty-seven thousand, four hundred eight baseball fans!

- 1** Here's a chart that shows the place value of every digit in the number 20,137,408. Use the information on the chart to answer questions a–i below.

100 Millions	10 Millions	Millions	100 Thousands	10 Thousands	Thousands	Hundreds	Tens	Ones
	2	0	1	3	7	4	0	8

- a** The digit in the millions place is: \_\_\_\_\_
- b** The digit in the ten thousands place is: \_\_\_\_\_
- c** The digit in the hundred thousands place is: \_\_\_\_\_
- d** The digit in the ten millions place is: \_\_\_\_\_
- e** Are there any hundred millions in this number? \_\_\_\_\_
- f** The digit in the hundreds place is: \_\_\_\_\_
- g** The digit in the thousands places is: \_\_\_\_\_
- h** The digit in the ones place is: \_\_\_\_\_
- i** The digit in the tens place is: \_\_\_\_\_

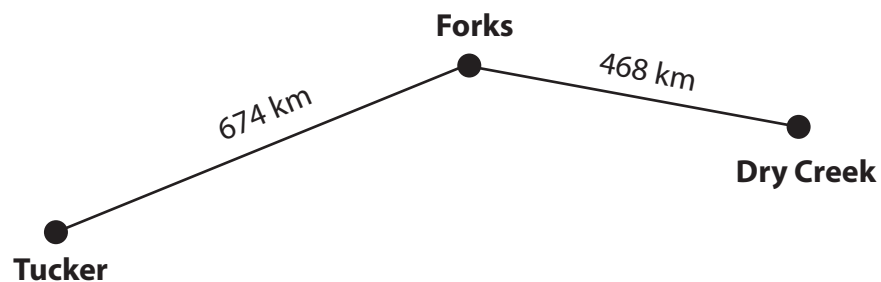
NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Rounding to the Nearest Thousand

- 1** What is 6,780 rounded to the nearest thousand? Fill in the bubble to show.
- 5,000       6,000       7,000       8,000
- 2** What is 5,438 rounded to the nearest thousand? Fill in the bubble to show.
- 5,000       6,000       7,000       8,000
- 3** It is 4,991 kilometers from Vancouver, BC, to Montreal. What is 4,991 rounded to the nearest thousand?
- 5,000       6,000       41,000       49,000
- 4** People in Canada measure long distances in kilometers instead of miles. Tera and her family drove from Tucker to Dry Creek last weekend. About how many kilometers did they drive? Fill in the bubble to show the best estimate.



- 1,050 kilometers       1,100 kilometers       1,150 kilometers
- 5** It is 1,164 kilometers from Vancouver, BC, to Edmonton. What is 1,164 rounded to the nearest thousand? Fill in the answer below.

1,164 kilometers rounded to the nearest thousand is \_\_\_\_\_.

- 6** It is 2,668 kilometers from Winnipeg to Kitimat. What is 2,668 rounded to the nearest thousand? Fill in the answer below.

2,668 kilometers rounded to the nearest thousand is \_\_\_\_\_.



## Work Place Instructions 4B Add, Round & Compare

### Each pair of players needs:

- a 4B Add, Round & Compare Record Sheet to share
- a deck of Number Cards

- 1 Players work together to remove the wild cards and the 10s from the deck of cards, shuffle them thoroughly, and place the deck face-down between them. Each player draws a card from the stack; the player with the greater number goes first.
- 2 Player 1 draws 3 cards from the deck, places them in any order he chooses to form a 3-digit number, and then writes that number on the record sheet. Then he rearranges the same 3 cards to form a different 3-digit number, and writes that on the sheet as well.
- 3 Player 1 rounds each number to the nearest hundred and writes the rounded numbers in the first row of the Rounded Numbers column of the record sheet.
- 4 Player 1 adds the actual numbers and the rounded numbers and records each sum on the record sheet. Player 2 checks Player 1's addition.
- 5 Player 1 finds the difference between the rounded numbers and the actual numbers and records it in the last column on the record sheet.

Sometimes the actual number will be larger, and sometimes the rounded number will be larger. Players write the larger number in the first line of the equation.

Unit 4 Module 1 | Session 4 class set, plus more as needed (double-sided), stored in the Work Place tray

NAME Riley | DATE \_\_\_\_\_

**4B Add, Round & Compare Record Sheet**

Actual Numbers	Rounded Numbers	Difference Between Actual Sum and Rounded Sum
$\begin{array}{r} 542 \\ + 254 \\ \hline 796 \end{array}$	$\begin{array}{r} 500 \\ + 300 \\ \hline 800 \end{array}$	$\begin{array}{r} 800 \\ - 796 \\ \hline 4 \end{array}$

*Riley I got a 5, a 2, and a 4. I decided to use those numbers to make 542 for the first number and 254 for the second number. I didn't know it would turn out so well, but maybe it's good if you make one number that rounds down and one that rounds up. So my rounded numbers were 500 and 300, which is 800, and the difference between my actual total and the rounded total was only 4!*

- 6 Now it is Player 2's turn. Player 2 repeats steps 2–5.
- 7 After three rounds of the game, players add their scores from all three rounds. The player with the lower score wins the game.

### Game Variations

- A Players can play Add, Round & Compare with 2-digit numbers by drawing only 2 cards instead of 3 on each turn, and rounding to the nearest 10 instead of the nearest 100.
- B Players can roll a more/less die before they start to play or at the very end of the game. If the die says *more*, the player with the higher score wins. If the die says *less*, the player with the lower score wins.
- C Players can play the game with 4-digit numbers by drawing 4 cards instead of 3 on each turn, and rounding to the nearest 1,000 instead of the nearest 100.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Adding Larger Numbers

1 Solve each problem below. Show your work.

$$\begin{array}{r} 392 \\ + 248 \\ \hline \end{array}$$

$$\begin{array}{r} 612 \\ + 189 \\ \hline \end{array}$$

$$\begin{array}{r} 475 \\ + 336 \\ \hline \end{array}$$

$$\begin{array}{r} 1,045 \\ + 760 \\ \hline \end{array}$$

2 Keiko has to add 3,996 and 4,204. What is an easy way for Keiko to add these two numbers? Solve the problem and show your work.

3 Max is playing Add, Round & Compare with a partner. He got a 3, an 8, and a 4 on his first turn. He decided to use those numbers to make 348 and 843.

a What are his rounded numbers? \_\_\_\_\_ and \_\_\_\_\_

b What is the sum of his rounded numbers? \_\_\_\_\_

c What is the sum of his actual numbers? Show your work.

d What is the difference between the sum of his rounded numbers and the sum of his actual numbers? Show your work.

e **CHALLENGE** Think of a way to arrange the three numbers Max got (3, 8, and 4) so there's less difference between his actual and rounded scores. Show your work.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Addition Practice

1 Solve the addition problems below using any strategy that works well for you.

$$\begin{array}{r} 254 \\ + 168 \\ \hline \end{array}$$

$$\begin{array}{r} 381 \\ + 227 \\ \hline \end{array}$$

$$\begin{array}{r} 129 \\ + 386 \\ \hline \end{array}$$

$$\begin{array}{r} 1,234 \\ + 765 \\ \hline \end{array}$$

2 Solve the addition problems below using the standard algorithm.

$$\begin{array}{r} 388 \\ + 165 \\ \hline \end{array}$$

$$\begin{array}{r} 276 \\ + 348 \\ \hline \end{array}$$

$$\begin{array}{r} 509 \\ + 297 \\ \hline \end{array}$$

$$\begin{array}{r} 168 \\ + 539 \\ \hline \end{array}$$

3 Write this number in words: 627,391.

4 Write two hundred fifty-three thousand, eight hundred eighteen in numbers.

5 Write this number in expanded form: 56,789.

**ex**  $32,569 = 30,000 + 2,000 + 500 + 60 + 9$

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Inventions

**1** Show your thinking and the answer for problems a and b below.

**a** If the telephone was invented in 1876, when was it 98 years old?

**b** If the hot air balloon was invented in 1783, when was it 197 years old?

**2** Fill in the blanks correctly.

$57 + 99 = \underline{\quad} + 100$

$199 + 357 = \underline{\quad} + 356$

$1,999 + 481 = \underline{\quad} + 480$

**3** Solve each addition combination below using the standard algorithm. Then check to make sure your answer is reasonable by rounding each addend to the nearest hundred, finding the total, and comparing it to the answer you got for the actual numbers.

Actual Numbers	Rounded Numbers
<b>ex</b> $\begin{array}{r} 11 \\ 528 \\ + 289 \\ \hline 817 \end{array}$	$\begin{array}{r} 500 \\ + 300 \\ \hline 800 \end{array}$
<b>b</b> $\begin{array}{r} 609 \\ + 195 \\ \hline \end{array}$	
<b>d</b> $\begin{array}{r} 108 \\ + 817 \\ \hline \end{array}$	

Actual Numbers	Rounded Numbers
<b>a</b> $\begin{array}{r} 418 \\ + 375 \\ \hline \end{array}$	
<b>c</b> $\begin{array}{r} 778 \\ + 293 \\ \hline \end{array}$	
<b>e</b> $\begin{array}{r} 288 \\ + 217 \\ \hline \end{array}$	

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Music Academy

Show your thinking and the answer.

- 1** The Music Academy was founded in 1847.
  - a** In what year was the academy 95 years old?
  - b** In what year was the academy 150 years old?
  - c** In what year will the academy be 275 years old?

- 2** Fill in the blanks.

$76 + 85 = 75 + \underline{\quad}$

$298 + \underline{\quad} = 300 + 127$

$725 + 174 = \underline{\quad} + 199$

- 3** Fill in the ratio table below.

Package	Tortillas
1	16
2	
	64
8	
	144
10	

- 4** The top part of the ratio table below is missing. Fill in the blanks in the mystery ratio table below.

	130
11	143
12	156
13	
	182
15	





## How Old? page 1 of 2

For each of the problems below, show your work. Hints:

- Think about whether the numbers in each problem lend themselves better to removal (take away) or finding the difference.
- Use labeled sketches of open number lines if you like.

**1** Anna was born in 1997. How old was she in 2012?

**2** Craig was born in 1992. How old was he in 2007?

**3** Peter was born in 1947. How old was he in 2000?

**4** Peter's wife, Sasha, was born in 1949. Is she older or younger than Peter? How old was she in 2000?

**5** Emma was born in 1963. How old was she in 2002?

**6** Emma's husband, Tom, was born in 1961. Is he older or younger than Emma? How old was he in 2002?

**How Old?** page 2 of 2

**7** If the telephone was invented in 1876, how “old” was it in 1991? (How long had it been around?)

**8** If the stethoscope was invented in 1819, how old was it in 1997?

**9** If the battery was invented in 1799, how old was it in 1998?

**10 CHALLENGE** Fill in the blanks with any dates that make the sentence true.

**a** Jon was born in \_\_\_\_\_ and was 39 years old in \_\_\_\_\_.

**b** Shelley was born in \_\_\_\_\_ and was 39 years old in \_\_\_\_\_.

**c** Aaron was born in \_\_\_\_\_ and was 39 years old in \_\_\_\_\_.



## Sam's Subtraction Strategies

Sam's fourth grade class is working on subtraction. Help Sam solve the problems below. Use whichever strategy works best for you.

- 1 Sam's math teacher is 33. Sam is 9. How much older is Sam's teacher than Sam?
- 2 Sam's art teacher is 51. How much older is Sam's art teacher than his math teacher?
- 3 Sam has to solve the problem  $91 - 76$ . Sam says it is easier to start at 91 and go back to 76 than to take 76 away from 91. Do you agree or disagree? Why?

### Review

- 4 Find each sum.

$$\frac{1}{10} + \frac{1}{100} =$$

$$\frac{5}{12} + \frac{3}{12} =$$

$$1\frac{1}{4} + 3\frac{3}{4} =$$

- 5 Find each difference.

$$2\frac{3}{8} - \frac{5}{8} =$$

$$\frac{3}{4} - \frac{1}{2} =$$

$$\frac{8}{10} - \frac{15}{100} =$$



## Rolling Dice

Austin rolled six 4–9 dice. He arranged the dice and made these 3-digit numbers: 548 and 796.

- 1 What is the sum of Austin's numbers? Use the strategy of your choice and show your work below.
- 2 What is the difference between Austin's numbers? Use the strategy of your choice and show your work below.
- 3 What is the largest 6-digit number Austin can make with the numbers he rolled?
- 4 What is the smallest 6-digit number Austin can make with the numbers he rolled?
- 5 Austin rolled the dice again. This time he made these numbers: 467 and 594. Austin says he can add 460 and 601 and get the same sum as 467 and 594. Do you agree or disagree? Why?
- 6 Austin says he can find the difference between 467 and 594 by finding the difference between 473 and 600. Do you agree or disagree? Why?



NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Using Subtraction Strategies

- 1** Look at each subtraction problem below. Think about which strategy makes the most sense for each problem. Solve each problem.

<b>a</b>	$\begin{array}{r} 3601 \\ - 589 \\ \hline \end{array}$	What strategy did you use? Why did you use this strategy?
----------	--	---

<b>b</b>	$\begin{array}{r} 789 \\ - 354 \\ \hline \end{array}$	What strategy did you use? Why did you use this strategy?
----------	---	---

<b>c</b>	$\begin{array}{r} 2623 \\ - 524 \\ \hline \end{array}$	What strategy did you use? Why did you use this strategy?
----------	--	---

- 2** Fill in the blanks in the equations below:

$$621 - 589 = 632 - \underline{\hspace{2cm}}$$

$$87 - \underline{\hspace{2cm}} = 94 - 60$$

$$1005 - 896 = \underline{\hspace{2cm}} - 900$$



## Work Place Instructions 4C Roll & Subtract One Thousand

### Each pair of players needs:

- two 4C Roll & Subtract One Thousand Record Sheets
- 3 dice numbered 1–6

- 1 Each player labels a record sheet with the date and both players' names. Players will keep track of their own results as well as those of their partner throughout the game.
- 2 Player 1 rolls the 3 dice and makes a 3-digit number with the digits rolled. Then she subtracts that number from 1,000, using the standard subtraction algorithm unless there's another method that makes more sense. Player 2 also subtracts the number from 1,000 to check Player 1's work, recording the results on his own record sheet.
- 3 Player 2 takes a turn to roll the dice, make a 3-digit number, and subtract it from 1,000. Player 1 also subtracts the number from 1,000 to check Player 2's work, recording the results on his own record sheet.
- 4 Players each take two more turns to roll and subtract 3-digit numbers from their total. Players share their strategies and check each other's work after each turn.

Player 1 Max	Player 2 Alana
$1,000 - 216 = 784$ $216 - 16 = 200$ $1000 - 16 = 984$ $984 - 200 = 784$	$1,000 - 456 = 544$
$\begin{array}{r} 7 \\ 784 \\ - 266 \\ \hline 518 \end{array}$	$\begin{array}{r} 544 \\ - 143 \\ \hline 401 \end{array}$

*Max* I really thought about the best way to do  $784 - 266$ . I finally picked the algorithm. Even though I had to cross out and borrow, it still seemed to be the easiest way.

*Alana* Taking away on the number line worked great for my first turn, but lining the numbers up and just subtracting on my second turn was really easy—no borrowing.

- 5 Players take one more turn each. After 3 turns each, the player with a total closest to 0 wins. If one player gets a negative number, the other player automatically wins the game.
- 6 Both players record two comparison statements at the bottom of their sheets using the symbols  $>$ ,  $=$ , or  $<$ . Then they circle the player who is closest to 0 without going into negative numbers.

### Game Variations

- A Players can play Roll & Subtract 250 by changing the heading and the first number on the record sheet, and rolling 2 dice each time. The dice they use can either be numbered 1–6, 4–9, or one of each.
- B Players can play Roll & Subtract 10,000 by changing the heading and first number on the record sheet, and rolling 4 dice each time. Players can also choose to use 1, 2, or 3 dice numbered 4–9 instead of using 4 dice all numbered 1–6 if they want.
- C Players can change the rules so they're allowed to go into negative numbers. Then the player closest to 0 after 3 turns, either under or over, wins the game.



## Helpful Hints

- 1 Jack has to solve the problem  $281 - 266$ . How would you tell him to solve the problem? Tell which strategy you would use, and then solve the problem.
- 2 Zia has to solve the problem  $311 - 287$ . How would you tell her to solve the problem? Tell which strategy you would use, and then solve the problem.
- 3 Randy has to solve the problem  $358 - 247$ . He says it is easy to use the standard algorithm for this problem. Do you agree or disagree? Why?
- 4 Lani has to solve the problem  $412 - 259$ . She says it is easy to use the standard algorithm for this problem. Do you agree or disagree? Why?
- 5 Put these numbers in order from least to greatest. Use relational symbols ( $<$ ,  $>$ ,  $=$ ) between each pair of numbers.

629,874

629,478

692,847

692,487

\_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_



NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Rounded Measures

The book *Hottest, Coldest, Highest, Deepest* talks about the longest rivers on Earth. The length of each river is shown in the table below.

- 1** Round the river lengths to the nearest thousand, hundred, and ten. The first one is done for you.

River	Length in Miles	Rounded to Nearest 1,000	Rounded to Nearest 100	Rounded to Nearest 10
Nile	4,145 miles	4,000 miles	4,100 miles	4,150 miles
Amazon	4,007 miles			
Chang Jiang	3,964 miles			
Mississippi-Missouri	3,710 miles			

- 2** If the average rate of travel is 100 miles per day, about how long would it take to travel down each river in days? Write an equation to show. The first one is done for you. (Hint: Use the most useful rounded figure instead of the actual length.)

Nile: $4,100 \div 100 = 41$ days	Amazon:
Chang Jiang:	Mississippi-Missouri:

- 3** If the average rate of travel is 10 miles per hour, about how long would it take to travel down each river in hours? Write an equation to show. This first one is done for you.

Nile: $4,100 \div 10 = 410$ hours	Amazon:
Chang Jiang:	Mississippi-Missouri:

- 4** Rounded to the nearest 10, about how much longer is the Nile than the Mississippi-Missouri? Show your work.



## Which Race Was Run?

Use the Distance Challenge Flyer to answer the questions below. Make ratio tables to show your thinking.

Unit 4 Module 3 | Session 2 - 1 copy for display

Distance Challenge Flyer

### Run Far Distance Challenge

Seven-race series includes:

5K	Oct 9
10K	Oct 16
10 Miler	Oct 23
18K	Oct 30
Half Marathon	Nov 14
30K	Nov 28
Marathon	Dec 12

**10K Course Record**  
Men 27:49  
Women 31:31

Register for one race or all at Sam's Shoe Outlet!

- 1** How many meters would Kayla run if she entered the first and second races in the series?

Answer: \_\_\_\_\_ meters

- 2** How many meters would Dana run if she entered the first four races in the series? (Note: 10 miles is approximately 16 kilometers.)

Answer: \_\_\_\_\_ meters

- 3** If Roberto ran 18,000 meters, which race(s) did he run?

Answer: \_\_\_\_\_

- 4** If Matthew ran 48,000 meters, which two races did he run?

Answer: \_\_\_\_\_



# Work Place Instructions 4D Target Five

## Each pair of players needs:

- 2 Target Five Record Sheets
- 2 dice numbered 1–6
- 3 dice numbered 4–9

**1** Players decide who will go first. Player 1 rolls all 5 dice, one at a time. As the dice are rolled, Player 1 lines them up left to right to form a 5-digit target number. Both players write the target number in the box at the top of their Target Five Record Sheet.

**2** Player 1 rolls all five dice and records the numbers in the first column of his record sheet. Player 1 then arranges those 5 digits to make a number that is as close as possible to the 5-digit target number, either under or over.

*Andrew* I rolled a 1, 6, 8, 5, and 1.

*Miranda* The target number is 68,729.

*Andrew* Wow! I really lucked out this time, because I got a 6 and an 8. That means I can make a number that starts with 68,000. I'll put the 5 for 500, and then the two 1s. That's as close as I can get.

**3** Player 1 records the number in the second column and reads it aloud. Then in the third column, he finds the difference between his number and the target number, using the standard subtraction algorithm unless there's another method that makes more sense.

**Note** Players need to show and check each other's work during this game.

**4** Finally, Player 1 records the difference between his number and the target number in the fourth column. That is his score for the first round. Player 2 takes a turn to complete steps 4–6.

<p style="font-size: small;">Unit 4 Module 3   Session 2 class set, plus more as needed, stored in the Work Place 4D tray</p> <p>NAME <u>Miranda</u>   DATE _____</p> <p> <b>4D Target Five Record Sheet</b></p> <p>Our Target Number <u>68,729</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Digits I Rolled</th> <th style="width: 15%;">Number I Made</th> <th style="width: 40%;">Difference Between My Number and the Target Number</th> <th style="width: 10%;">Score</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">6, 8, 8, 3, 2</td> <td style="text-align: center;">68,823</td> <td style="text-align: center;"> <math display="block">\begin{array}{r} 68,823 \\ - 68,729 \\ \hline 94 \end{array}</math> </td> <td style="text-align: center;">94</td> </tr> </tbody> </table>	Digits I Rolled	Number I Made	Difference Between My Number and the Target Number	Score	6, 8, 8, 3, 2	68,823	$\begin{array}{r} 68,823 \\ - 68,729 \\ \hline 94 \end{array}$	94	<p style="font-size: small;">Unit 4 Module 3   Session 2 class set, plus more as needed, stored in the Work Place 4D tray</p> <p>NAME <u>Andrew</u>   DATE _____</p> <p> <b>4D Target Five Record Sheet</b></p> <p>Our Target Number <u>68,729</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Digits I Rolled</th> <th style="width: 15%;">Number I Made</th> <th style="width: 40%;">Difference Between My Number and the Target Number</th> <th style="width: 10%;">Score</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1, 6, 8, 5, 1</td> <td style="text-align: center;">68,511</td> <td style="text-align: center;"> <math display="block">\begin{array}{r} 68,729 \\ - 68,511 \\ \hline 218 \end{array}</math> </td> <td style="text-align: center;">218</td> </tr> </tbody> </table>	Digits I Rolled	Number I Made	Difference Between My Number and the Target Number	Score	1, 6, 8, 5, 1	68,511	$\begin{array}{r} 68,729 \\ - 68,511 \\ \hline 218 \end{array}$	218
Digits I Rolled	Number I Made	Difference Between My Number and the Target Number	Score														
6, 8, 8, 3, 2	68,823	$\begin{array}{r} 68,823 \\ - 68,729 \\ \hline 94 \end{array}$	94														
Digits I Rolled	Number I Made	Difference Between My Number and the Target Number	Score														
1, 6, 8, 5, 1	68,511	$\begin{array}{r} 68,729 \\ - 68,511 \\ \hline 218 \end{array}$	218														

**5** Players continue to take turns until they have played 5 rounds. Then they add up their scores for each round to get a grand total. The player with the lower grand total wins the game.

**6** After the game is finished, each player uses the >, =, or < symbol to compare her final score with her partner's at the bottom of her record sheet, and then circles the winning score.

## Game Variations

- A** Students may choose to play Target Five together rather than playing against each other.
- B** Students may choose to partner up, then play another pair competitively.
- C** Students may choose a digit at the beginning of the game that, when rolled, acts as a wild number. If a player happens to roll that digit at the start of a turn, he can replace it with any digit he chooses, 0–9. This should improve his chances of making a 5-digit number that's close to the target number.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Running Longer Distances

**1** Make a ratio table to show your thinking.

- a** Ava signed up to run a half marathon, which is approximately 21 kilometers. About how many meters will she run in the race?

Answer: \_\_\_\_\_ meters

- b** Bryan will run a full marathon. About how many meters will his race be?

Answer: \_\_\_\_\_ meters

**2** Fill in the blank with the correct relational symbol:  $<$ ,  $>$  or  $=$ .

- a** 16 km \_\_\_\_\_ 16,000 meters

- b** 1800 meters \_\_\_\_\_ 18 km

- c**  $13\frac{1}{2}$  km \_\_\_\_\_ 13,500 meters

**3** Complete the multiplication problems below.

$$\begin{array}{r} 41 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 32 \\ \times \square \\ \hline 320 \end{array}$$

$$\begin{array}{r} \square \\ \times 10 \\ \hline 700 \end{array}$$

$$\begin{array}{r} 100 \\ \times 12 \\ \hline \square \end{array}$$

$$\begin{array}{r} \square \\ \times 40 \\ \hline 4000 \end{array}$$

**4** Is  $\frac{4}{5}$  greater or less than  $\frac{45}{100}$ ? How do you know?



## World Records

- 1** Use the Distance Challenge Flyer to solve the problems below. Use an open number line to model and solve each one.

Unit 4 Module 3 | Session 2 - 1 copy for display

 Distance Challenge Flyer

### Run Far Distance Challenge

Seven-race series includes:

5K	Oct 9
10K	Oct 16
10 Miler	Oct 23
18K	Oct 30

**10K Course Record**  
Men 27:49  
Women 31:31

- a** The world record for men in a 10K is 26:17. How much faster is this than the Distance Challenge course record?
- b** The world record for women in a 10K is 29:32. How much slower is the course record in the Distance Challenge?
- c** If a runner starts a race at 6:15 a.m. and runs for 75 minutes, what time does she stop running?
- d** If a runner ended a race at 8:43 and ran for 73 minutes, what time did he start running?
- 2** How many seconds are there in  $3\frac{1}{2}$  minutes? Show your work.
- 3** How many minutes are there in 5 hours? Show your work.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Preparing to Race

- 1** Use an open number line to model and solve each of these problems.
- a** Jacob woke up at 5:50 a.m. on race day. He got ready in 35 minutes and drove 15 minutes to the event. Will he make it to the race for the 6:45 start time? Explain your thinking.
- b** During her practice this month, Briana ran one 10K in 1:02:18 and another in 58:49. How much faster was her second 10K practice?
- c** Trevor needs to be at the starting line by 8:00 a.m. He needs 45 minutes to drive to the event, 20 minutes to eat breakfast, and 15 minutes to shower and dress. What time should he set his alarm so that he is on time for the race?

- 2** Fill in the ratio tables.

**a**

Minutes	Seconds
1	60
2	
	180
5	
	600
12	

**b**

Hours	Minutes
1	60
3	
	360
	420
8	
11	

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Drinks for Runners

### How much did each runner drink?

Visit each station and examine the measuring cup filled with water. Fill in the chart below with the volume of water each runner drank. Then answer the questions that follow.

Water Runners Drank			
Runner	Amount in ml	Runner	Amount in ml
Runner A		Runner F	
Runner B		Runner G	
Runner C		Runner H	
Runner D		Runner I	
Runner E		Runner J	

- How many milliliters did Runners D and J drink in all? How many liters?
- How many milliliters did Runners D, E, G, I, and J drink in all? How many liters?
- How many milliliters did all 10 runners drink? How many liters?

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Liquid Intake

- 1** Each runner in the 5K race was given a liter of water to drink as she crossed the finish line. How many milliliters total were in the first 10 bottles handed out? Show your work.

Answer: \_\_\_\_\_ milliliters

- 2** Carly bought a 2-liter bottle of water on the morning of her race. She drank 450 milliliters before the race began and 250 milliliters during the race. How much was left for after the race? Show your work.

Answer: \_\_\_\_\_ milliliters

- 3** Jon bought a 6-pack of sports drink bottles that each had a volume of 350 ml.

**a** If Jon drank 4 of them, how many milliliters did he drink? Show your work.

Answer: \_\_\_\_\_ milliliters

**b** How many more milliliters would Jon need to drink to have 2 liters? Show your work.

Answer: \_\_\_\_\_ milliliters

- 4** Fill in the ratio table to convert liters to milliliters.

<b>liters</b>	1	2		5		12
<b>milliliters</b>	1,000		4,000		9,000	

- 5** Fill in the blanks with the correct relational symbol:  $<$ ,  $>$ , or  $=$

**a** 13,050 \_\_\_\_\_ 13,500

**b**  $600,000 + 50,000 + 3,000 + 20 + 9$  \_\_\_\_\_ 653,209

**c** four hundred thousand, sixty two \_\_\_\_\_ 400,062





NAME \_\_\_\_\_

DATE \_\_\_\_\_



## More Food

- 1** Ryan bought 3 pounds of bananas to take to his race. When he returned home after his event, he put what was left on his kitchen scale. He discovered that he had eaten all but 13 ounces. How much did Ryan eat? Show your work.

Answer: \_\_\_\_\_ ounces

- 2** Liz, Dante, and Jasmine each ate 225 grams of oranges. How many more grams would the 3 of them need to eat to have eaten a kilogram of oranges? Show your work.

Answer: \_\_\_\_\_ grams

- 3** Fill in the ratio tables.

**a**

Kilograms	Grams
1	1,000
4	
	6,000
11	
	12,000
15	

**b**

Pounds	Ounces
1	16
2	
	48
	80
	160
15	

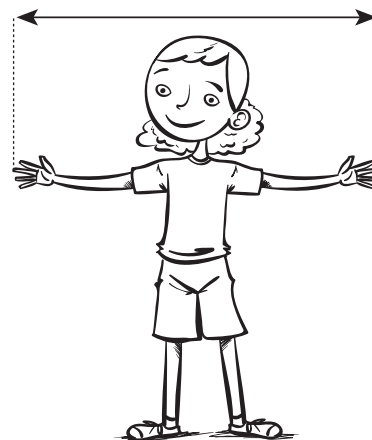


## Arm Spans

Your arm span is the distance from fingertip to fingertip when you stand with both arms outstretched, like the person in the picture.

**1** In your small group, discuss how to measure each other's arm spans. Talk about the 3 questions below.

- What tools will you need?
- How might you arrange the tools to make it as easy as possible to make accurate measurements?
- How can you and the people in your group double-check your measurements for accuracy?



**2** Once you have agreed on a system for measuring, design a table on the grid below that you can use to record your own arm span and the arm spans of 3 other students.

**3** Work together to measure the arm spans of everyone in your small group and write them on the table.

**4** Collect data from other small groups to add to your table if you have time.


NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Butterfly Wingspans

Use the table to answer the questions below.

Butterfly wingspans	
Butterfly	Wingspan
American Copper Butterfly	$1\frac{1}{4}$ inch
Blue Morpho Butterfly	6 inches
Eastern Tiger Swallowtail Butterfly	$4\frac{1}{2}$ inches
Monarch Butterfly	$3\frac{3}{4}$ inches
Queen Alexandra's Birdwing Butterfly	11 inches
Zebra Swallowtail Butterfly	$2\frac{1}{2}$ inches

- What do you notice about the data in the table? Write at least two observations.
- What is the shortest (minimum) wingspan? \_\_\_\_\_
- What is the longest (maximum) wingspan? \_\_\_\_\_
- What is the difference between the shortest and longest wingspans? (range) Show your work.
- If there were 5 zebra swallowtail butterflies lined up side-by-side on a branch with their wings spread out, how much space would they take up? Show your thinking using numbers, labeled sketches, or words.



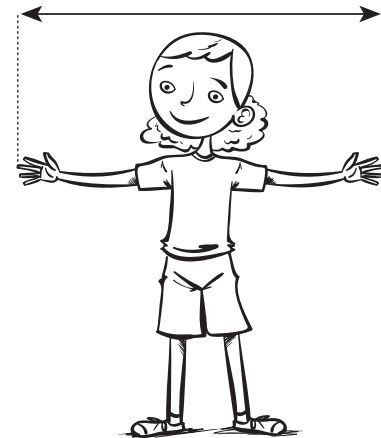
# Arm Spans Line Plot

1 Draw a line plot showing the arm span measurements for the class.



2 What observations can you make about the data?

3 Based on your observations, how would you describe the typical arm span for a student in your class?



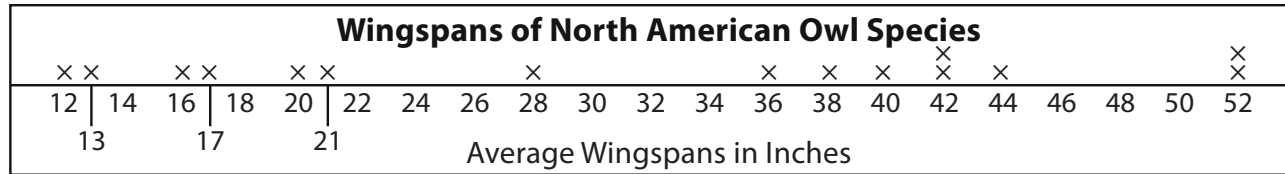
NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Median, Mode & Range

Use the line plot to answer the questions below. Remember to label your answers with the unit.



- 1 What is the minimum wingspan?
- 2 What is the maximum wingspan?
- 3 What is the range of the wingspans of these owls? Please show your work.
- 4 What is the median wingspan for these owls?
- 5 What is the mode for this set of data?
- 6 Circle the length you think best describes the wingspan of a typical owl in North America and explain your choice.  
 17 inches                      36 inches                      42 inches                      52 inches

NAME \_\_\_\_\_

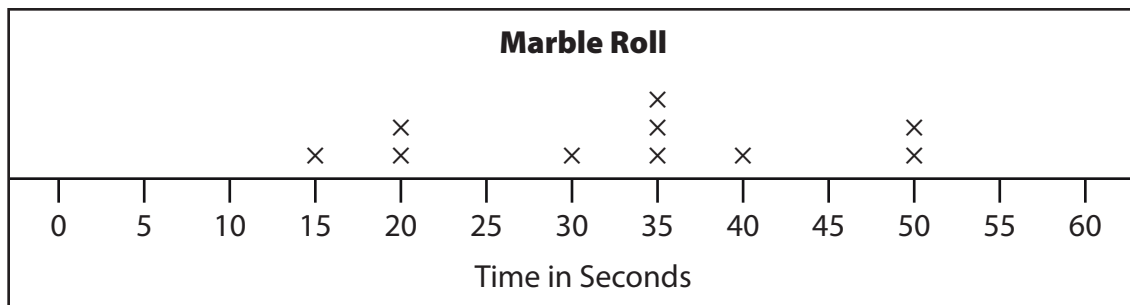
DATE \_\_\_\_\_



## Marble Roll

Carter and Pedro made an obstacle course for a marble roll. They dropped a marble into the course 10 times and recorded how long the marble took to go through each time.

- 1** The line plot below shows how long it took the marble to go through the obstacle course each time.



- a** What is the minimum time?
- b** What is the maximum time?
- c** What is the range?
- d** What is the median?
- e** What does the median tell you about this set of data?
- f** What is the mode?
- g** What does the mode tell you about this set of data?

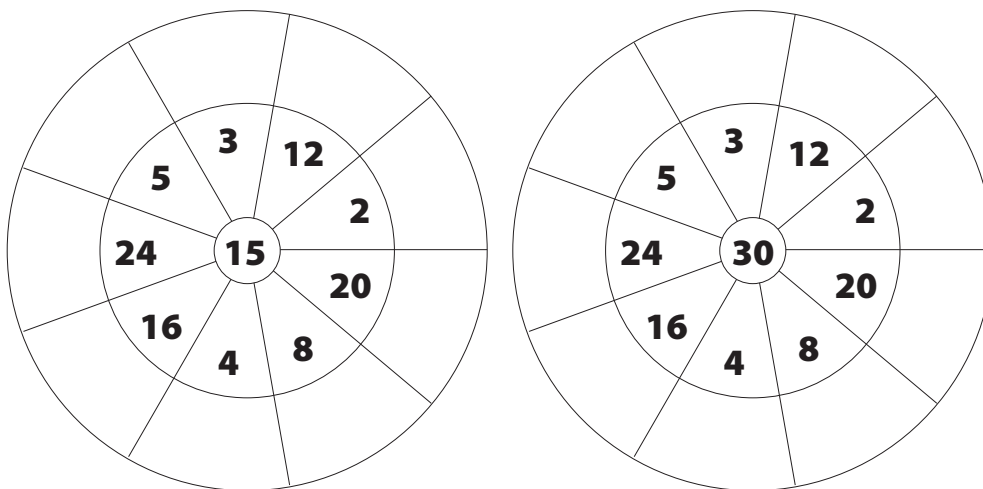




## Elena's Trip

- Elena traveled from Istanbul to Ankara, which is 351 kilometers. Then she went from Ankara to Marmaris, which is 527 kilometers. If it is 468 kilometers back to Istanbul, how far did Elena travel in all on her trip? Show your work.
- Elena and her brother ate cookies on their trip. Elena ate  $\frac{3}{4}$  of her cookies and her brother ate  $\frac{2}{3}$  of his. Elena says they ate the same amount because they both have one cookie left. Is she correct? Explain.
- Which equation is **not** true?
 

<input type="radio"/> $1.25 = 1\frac{1}{4}$	<input type="radio"/> $6.05 < 6.5$
<input type="radio"/> $2\frac{4}{100} = 2.4$	<input type="radio"/> $4\frac{1}{4} > 4\frac{1}{5}$
- List all of the factor pairs for 63.
- Fill in the missing information on the Multiple Wheels.



- Round 15,615 to the nearest:

ten	hundred	thousand	ten thousand

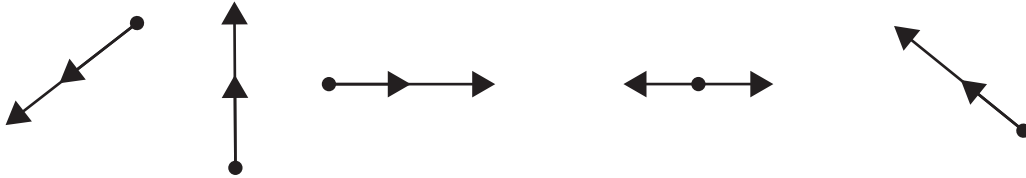
NAME \_\_\_\_\_

DATE \_\_\_\_\_

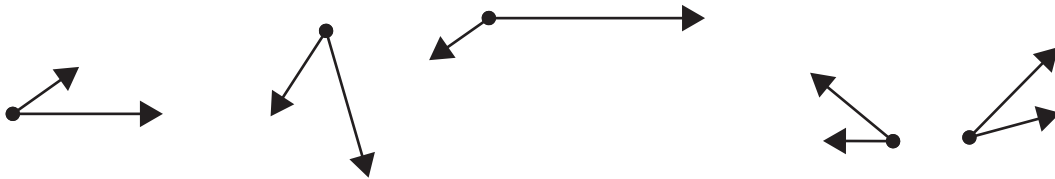
# Which Angle Doesn't Belong?

In each group of 5 angles, there is one that does not belong. Circle the angle that doesn't belong for each group.

1



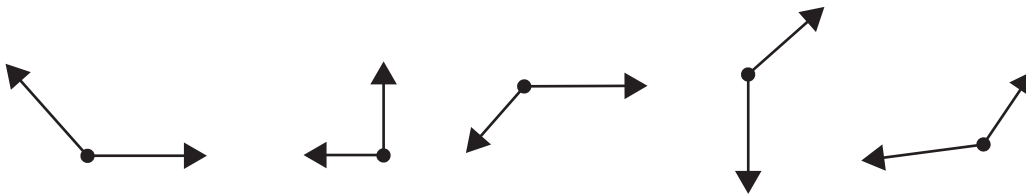
2



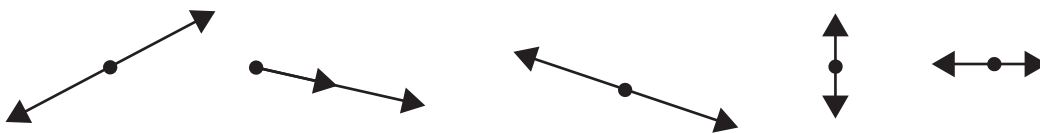
3



4



5



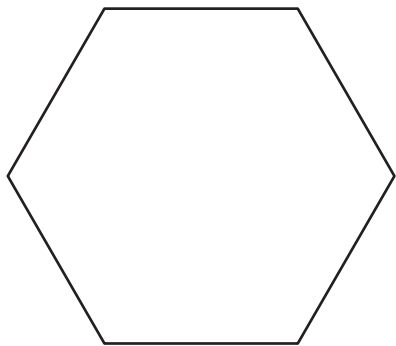
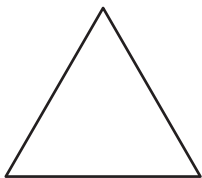
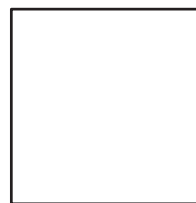
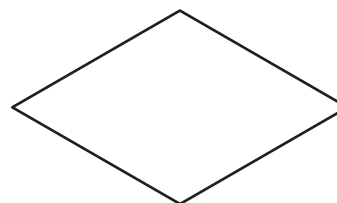
NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Pattern Block Angles

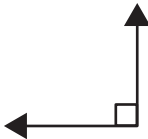
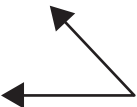
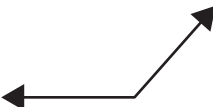
Label the angles in each shape below. Use the words *zero*, *acute*, *right*, *obtuse*, or *straight* to label each angle.

**1****2****3****4****5****6**

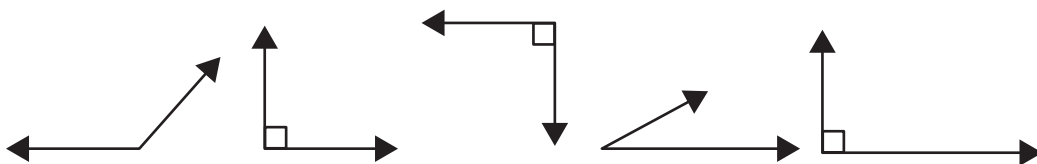


# Right, Acute & Obtuse Angles

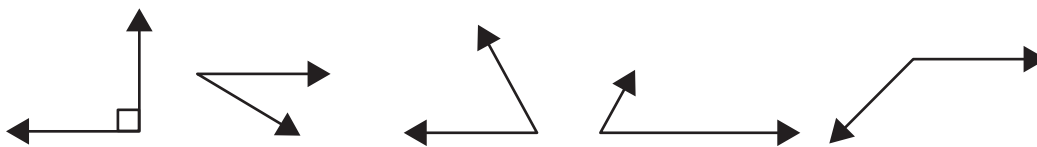
1 Use the information below to help solve the following problems.

<p>A right angle is exactly 90 degrees.</p> 	<p>An acute angle is less than 90 degrees.</p> 	<p>An obtuse angle is more than 90 degrees.</p> 
---	--	---

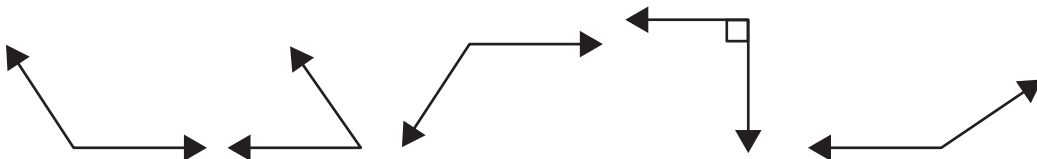
a Circle all the right angles.



b Circle all the acute angles.



c Circle all the obtuse angles.



2 Draw another ray to make an acute angle.



3 Draw another ray to make an obtuse angle.



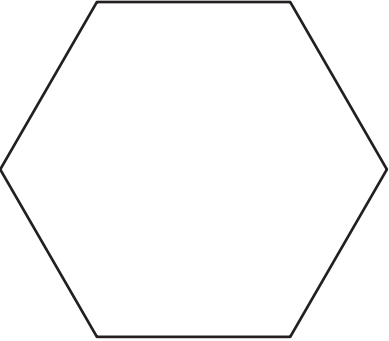
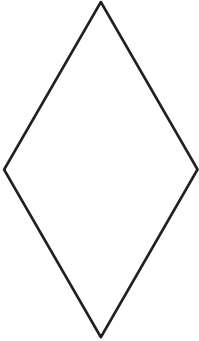
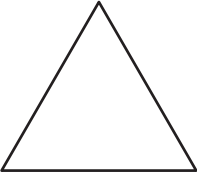

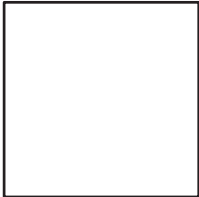
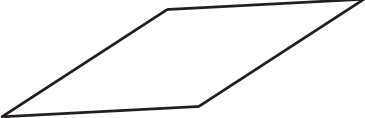
NAME \_\_\_\_\_

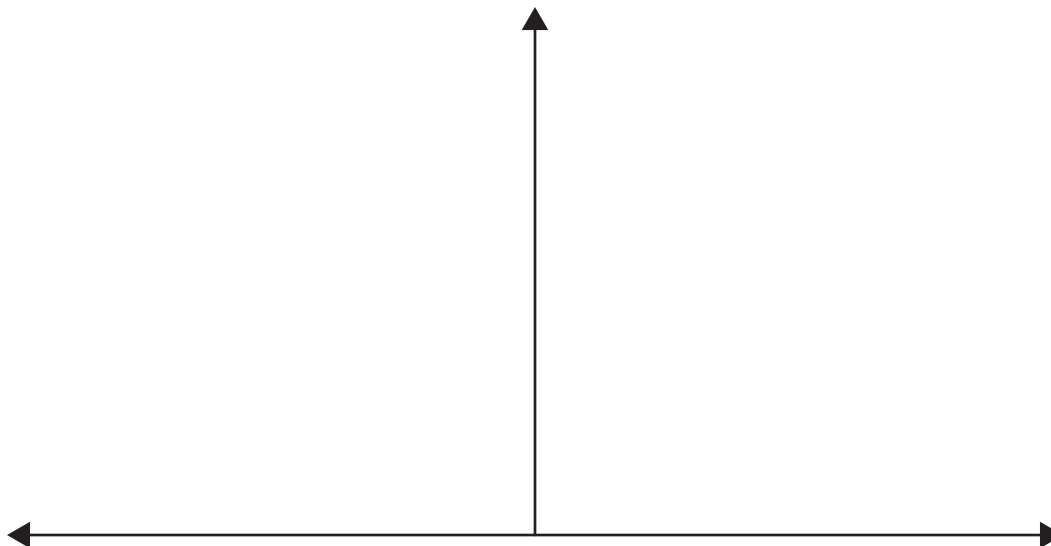
DATE \_\_\_\_\_



## Measuring Pattern Block Angles

Label the interior angles of each pattern block shown below. Use the straight and right angles below to help determine the measure of each pattern block angle.

<b>1</b> 	<b>2</b> 	<b>3</b> 
<b>4</b> 	<b>5</b> 	<b>6</b> 



NAME \_\_\_\_\_

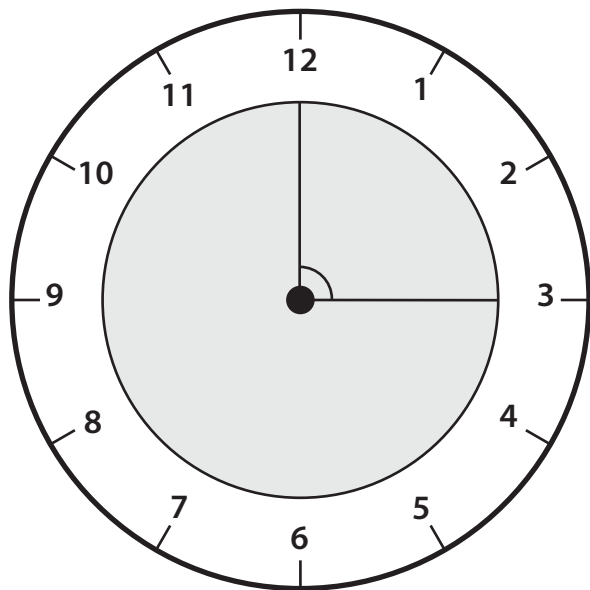
DATE \_\_\_\_\_



## Using Pattern Blocks to Measure Angles on a Clock Face

Use your pattern blocks to measure each angle on the clock faces below. Then write the fraction of a whole turn each angle represents.

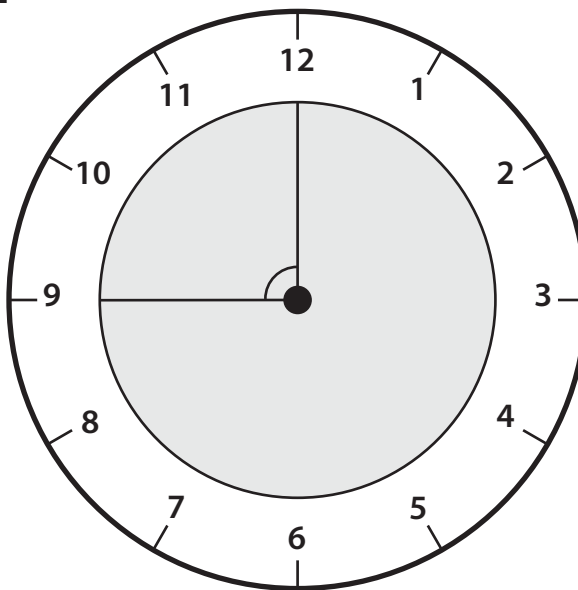
**1**



Angle measure \_\_\_\_\_

Fraction of a whole turn \_\_\_\_\_

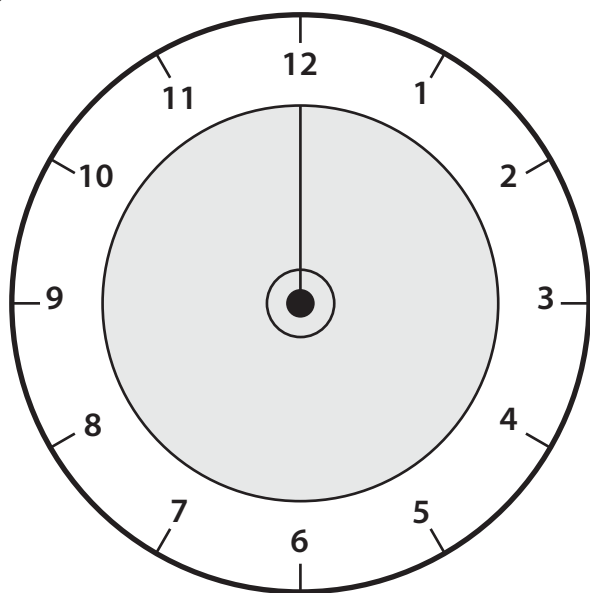
**2**



Angle measure \_\_\_\_\_

Fraction of a whole turn \_\_\_\_\_

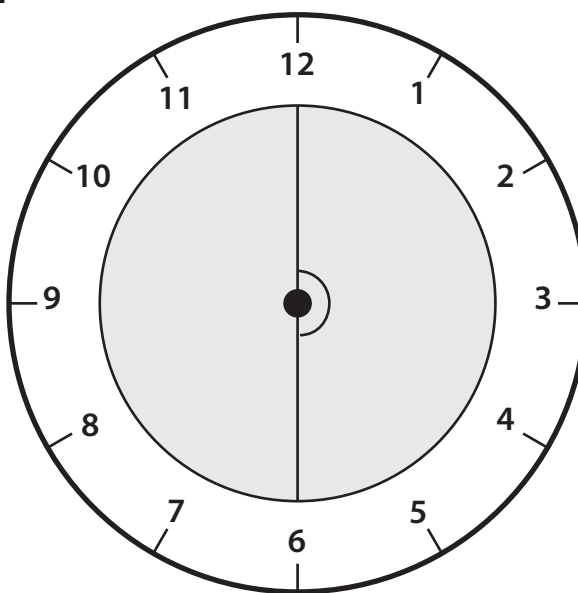
**3**



Angle measure \_\_\_\_\_

Fraction of a whole turn \_\_\_\_\_

**4**



Angle measure \_\_\_\_\_

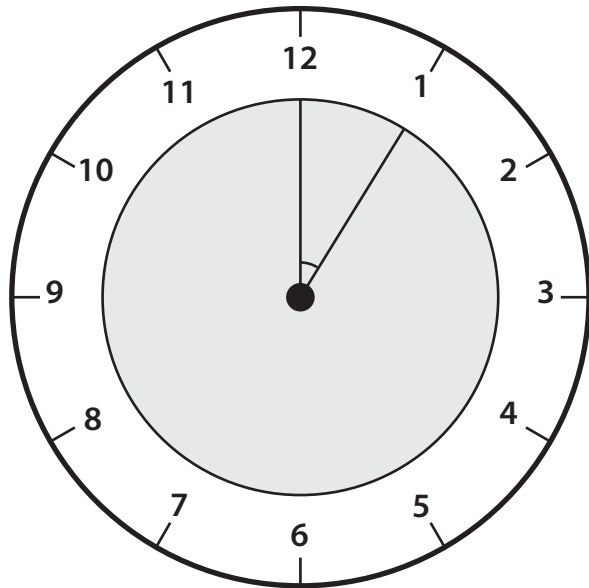
Fraction of a whole turn \_\_\_\_\_

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Using Pattern Blocks to Measure Angles on a Clock Face** page 2 of 2

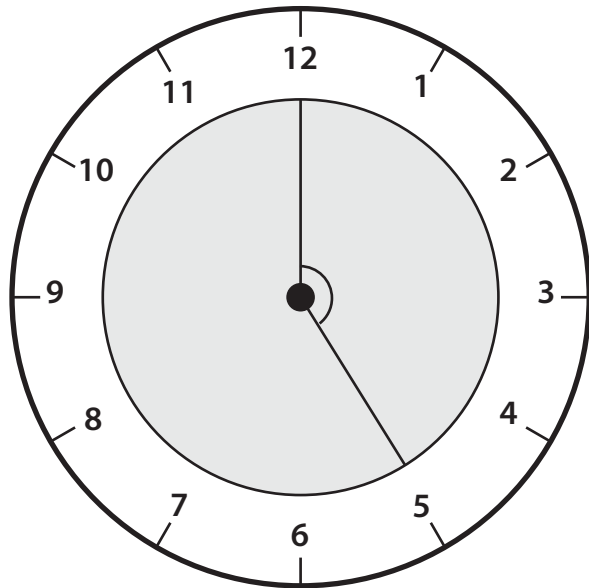
**5**



Angle measure \_\_\_\_\_

Fraction of a whole turn \_\_\_\_\_

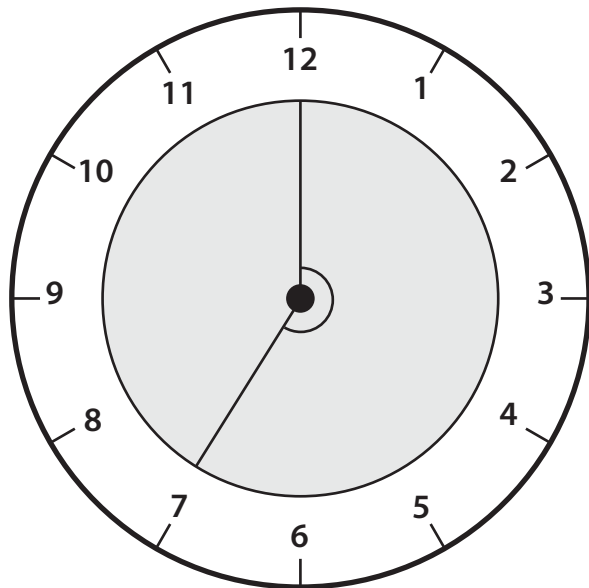
**6**



Angle measure \_\_\_\_\_

Fraction of a whole turn \_\_\_\_\_

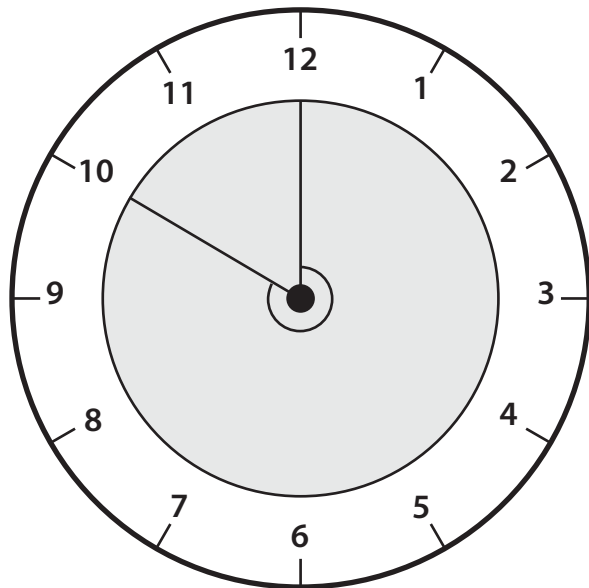
**7**



Angle measure \_\_\_\_\_

Fraction of a whole turn \_\_\_\_\_

**8**



Angle measure \_\_\_\_\_

Fraction of a whole turn \_\_\_\_\_

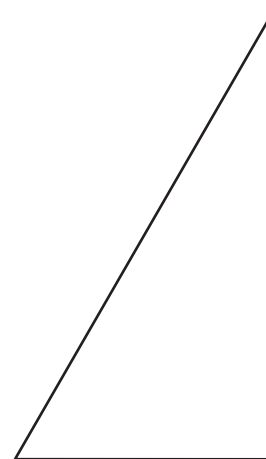
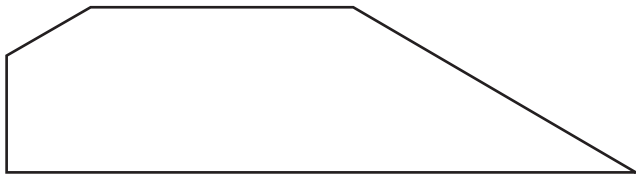
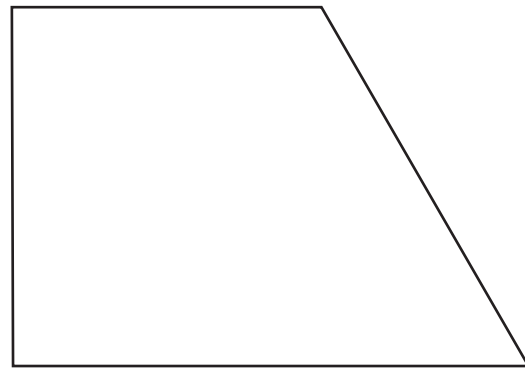
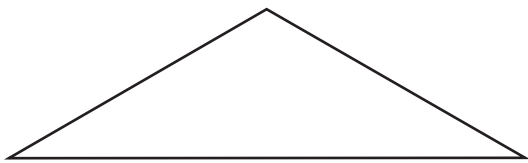
NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Measuring Interior Angles of Polygons

Use your pattern blocks to measure the interior angles of each polygon below. Label each angle with its measurement.







## Work Place Instructions 5A Angle Puzzles

### Each student needs:

- 1 5A Angle Puzzles Record Sheet
- 1 spinner overlay
- pattern blocks

- 1 Spin the spinner to find out what kind of angle to make.
- 2 Use pattern blocks to make an example of the type of angle spun.
- 3 Trace the pattern blocks on the record sheet and label each of the interior angles.
- 4 Record an equation to describe how the angle was made.

Unit 5 Module 1 | Session 4 2 class sets, one for use during this session, and a second stored in the Work Place tray

NAME Jasmine | DATE \_\_\_\_\_

5A Angle Puzzles Record Sheet page 1 of 2

Angle: <u>Right Angle</u>	
First Sketch	Second Sketch
Equation: $60^\circ + 30^\circ = 90^\circ$	Equation:

Bridges in Mathematics Grade 4 Teacher Masters T7 © The Math Learning Center | mathlearningcenter.org

- 5 Make the same angle with a different combination of pattern blocks. Trace and label and write an equation to represent the second way of making the angle.
- 6 Repeat steps 2–5 two more times to make 3 different types of angles in all.  
If an angle already built is spun, spin again until a new angle is spun.

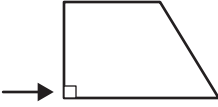
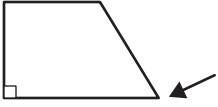
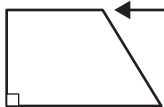
### Game Variations

- A Work with a partner to figure out 2 or more different ways to make each angle.
- B Work on just one angle and try to find all of the different possibilities for making it.

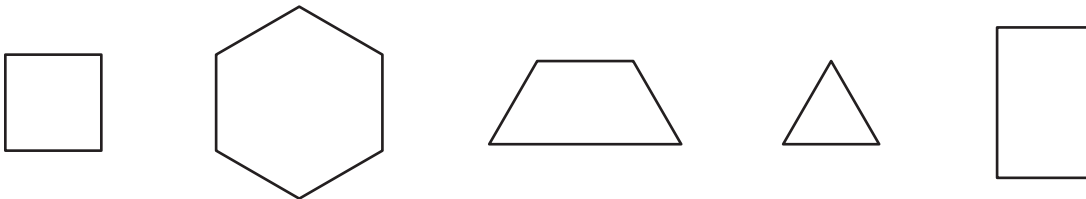


# Angles in Polygons

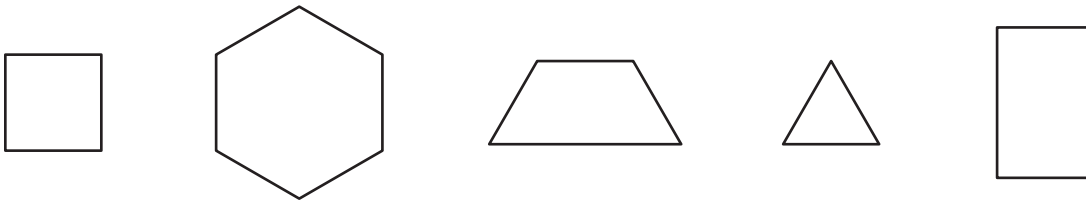
Use the following information to help solve the problems below.

<p><b>Right Angle</b> exactly <math>90^\circ</math> a square corner</p> 	<p><b>Acute Angle</b> smaller than a right angle</p> 	<p><b>Obtuse Angle</b> larger than a right angle</p> 
---	--	--

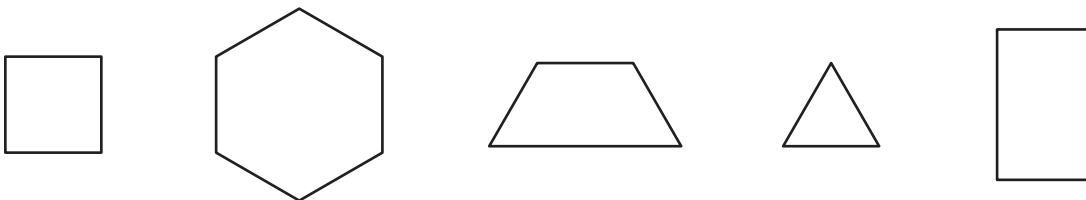
**1** Circle the polygon that has only acute angles.



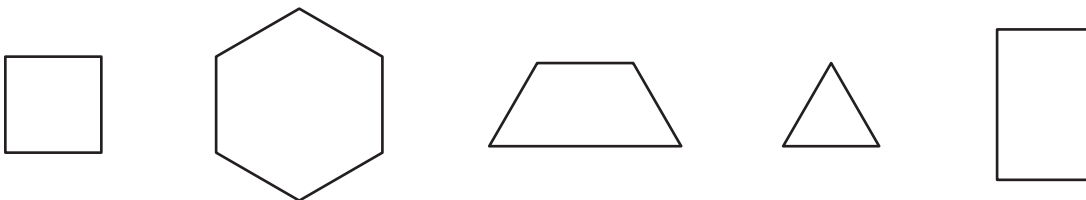
**2** Circle the polygon that has only obtuse angles.



**3** Circle the polygons that have only right angles.



**4** Circle the polygon that has 2 acute angles and 2 obtuse angles.





# Thinking About Circles page 1 of 2

Circles	Not Circles

**1** Study the diagram above.

**a** Circle the circles in the row of shapes below.



**b** How do you know that the shapes you circled are circles?

**c** Draw 2 examples of circles.

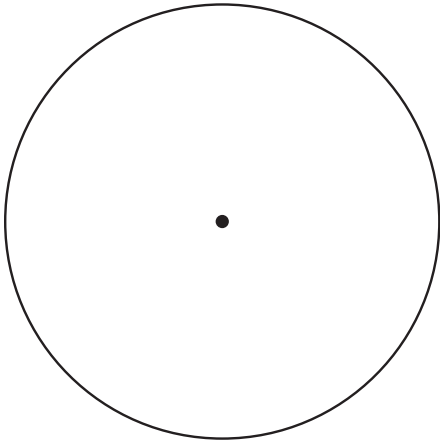
**d** Draw 2 examples of shapes that are not circles.

**e** How would you define circles?

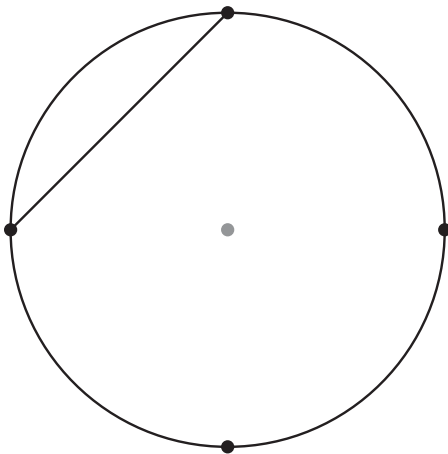
*(continued on next page)*

**Thinking About Circles** page 2 of 2

- 2** Use the circle below for a–c.
- a** Draw and label two examples of a radius on the circle below.
  - b** Draw and label two examples of a diameter on the circle below.
  - c** Draw and label an arrow pointing to the circumference of the circle below.



- 3** Draw three more straight lines to connect the 4 points on the circumference of the circle below. The first two points have been connected for you. Connect the rest of the points in the same manner. The points are all spaced equally around the circumference. Do not connect any points to the center.



- a** What shape did you just draw inside the circle?
- b** Use labeled sketches, numbers, or words to convince someone else that you have identified the shape correctly in part a above.

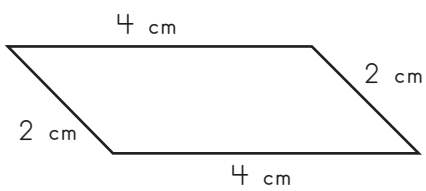
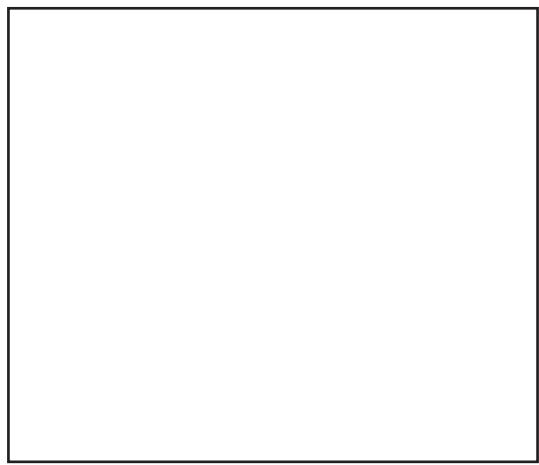
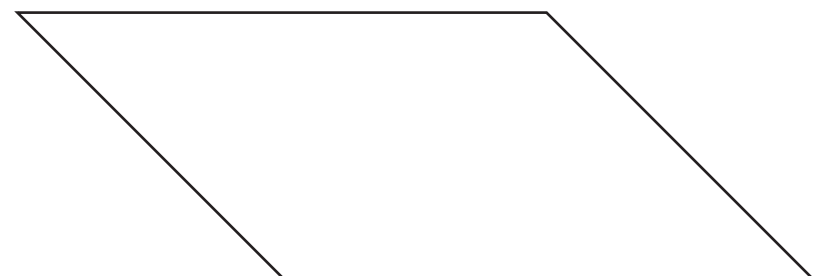
NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Finding Perimeters of Quadrilaterals

- 1** Use a ruler to measure the sides of each quadrilateral in centimeters. Label all the sides of each shape. Then find the perimeter. For **a**, find the area also. Show your work.

<div style="text-align: center;">  </div> <p style="text-align: center;"><math>2 + 2 + 4 + 4 = 12 \text{ cm}</math></p> <p><b>ex</b></p> <p style="text-align: center;">Perimeter = <u>12 cm</u></p>	<div style="text-align: center;">  </div> <p><b>a</b></p> <p style="text-align: center;">Area = _____ Perimeter = _____</p>
<div style="text-align: center;">  </div> <p><b>b</b></p> <p style="text-align: center;">Perimeter = _____</p>	

- 2** Solve the following problems:

**a**  $347 + 652 = \underline{\hspace{2cm}}$

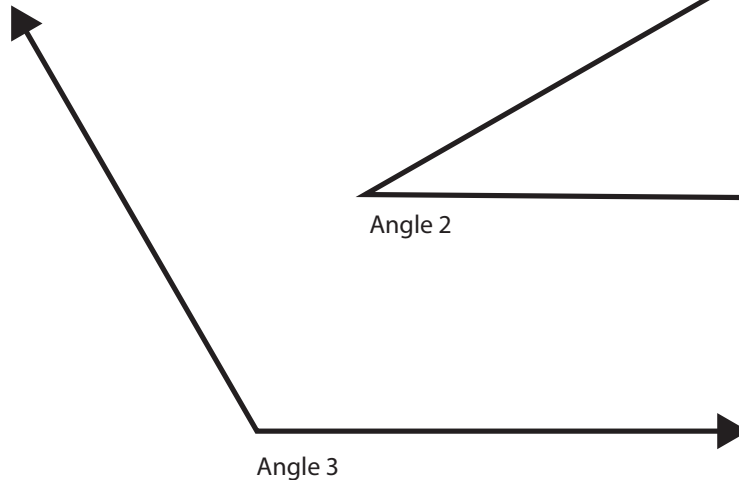
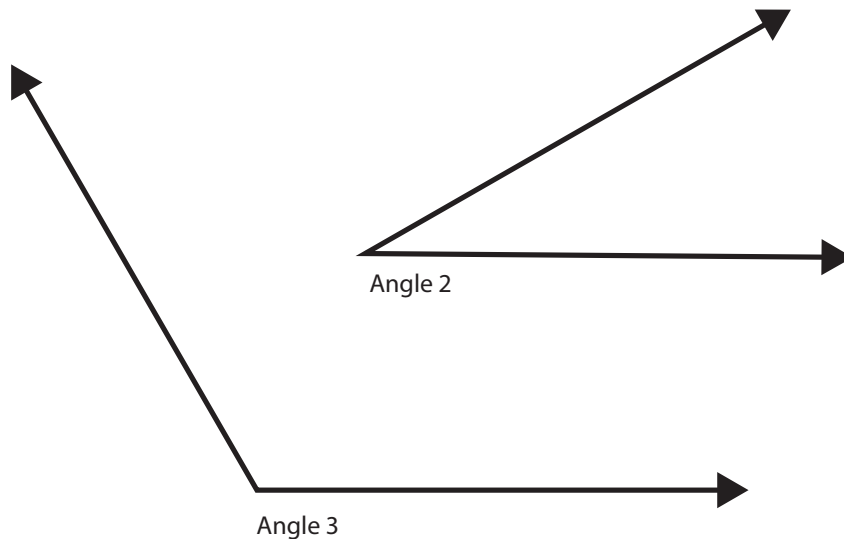
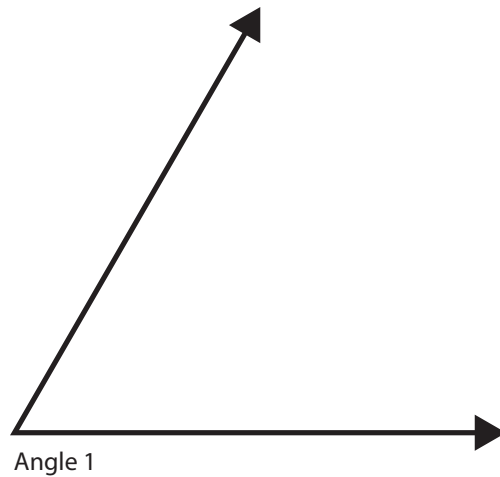
**b**  $65 \times 29 = \underline{\hspace{2cm}}$

**c**  $60 \div 4 = \underline{\hspace{2cm}}$

**d**  $501 - 388 = \underline{\hspace{2cm}}$



# Experimenting with Angle Measurement page 1 of 2



- 1** For each angle:
  - a** Estimate how many degrees you think it measures.
  - b** Use a pattern block to check the measure. (Each angle below matches one or more of the angles in your pattern blocks.)
  - c** Measure it with your protractor.

Angle	How many degrees? (estimate)	How many degrees? (actual measure)
<b>1</b>		
<b>2</b>		
<b>3</b>		

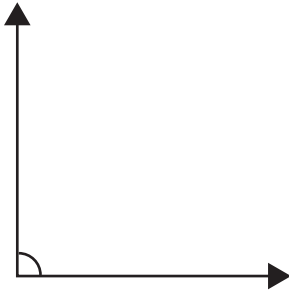
*(continued on next page)*

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Experimenting with Angle Measurement** page 2 of 2

- 4** Lan says the angle below measures about  $120^\circ$ . Do you agree or disagree with her? Explain your answer.



- 5** Using a protractor, construct a  $60^\circ$  angle below or on a separate piece of paper. (If you use another sheet of paper, attach it to this assignment.) Check your work with a pattern block, and include the pattern block in your angle sketch.

- 6** **CHALLENGE** Look around your classroom for acute angles. Choose several. For each angle you choose:

- Estimate how many degrees you think it measures.
- Measure it with your protractor.
- Record your work on the chart below.

Acute Angles in the Classroom	How many degrees? (estimate)	How many degrees? (actual measure)

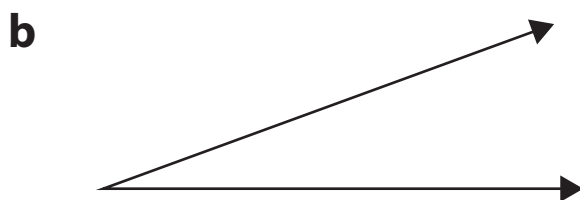
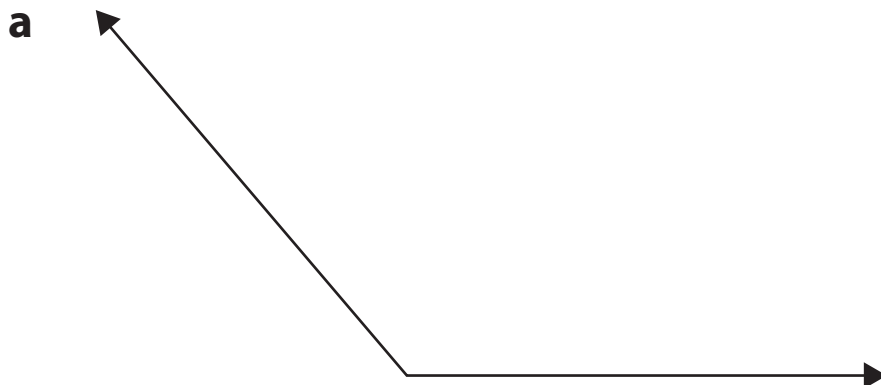
NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Measuring & Constructing Angles

- 1** Use a protractor to measure the angles, and then record your measurements. Label each angle as acute, obtuse, or right.



- 2** Use a protractor to construct and draw the following angles. If you don't have enough room here, sketch these angles in your math journal.

<p><b>a</b> 80° angle</p>	<p><b>b</b> 45° angle</p>
---------------------------	---------------------------

- 3** Fill in the blanks to make each equation true.

$$\frac{1}{2} \text{ of } 28 = \underline{\quad} \quad \frac{1}{4} \text{ of } 28 = \underline{\quad} \quad 4 \times \frac{1}{3} = \underline{\quad} \quad 7 \times \frac{1}{3} = \underline{\quad} \quad 10 \times \frac{1}{3} = \underline{\quad}$$



NAME \_\_\_\_\_

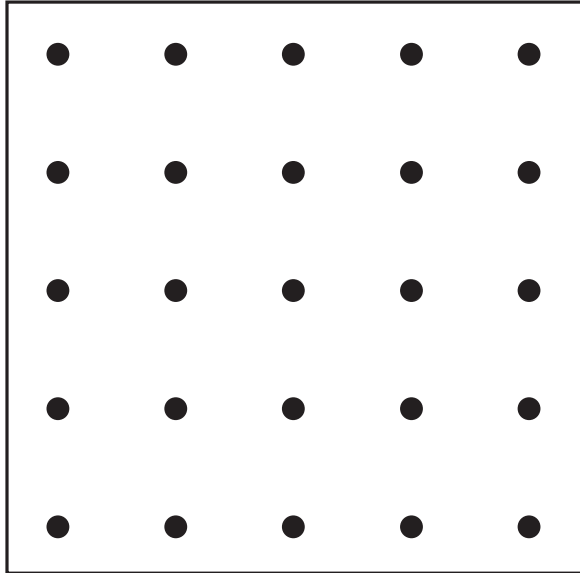
DATE \_\_\_\_\_

 **Dots & Lines Game Record Sheet**

Blue Team \_\_\_\_\_

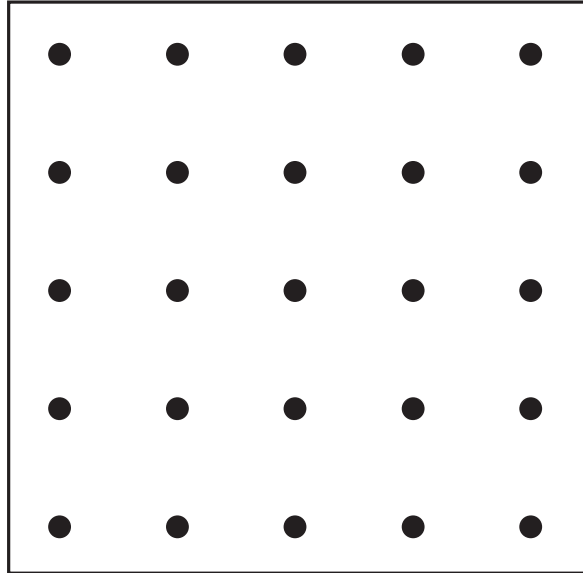
Red Team \_\_\_\_\_

**Game 1**



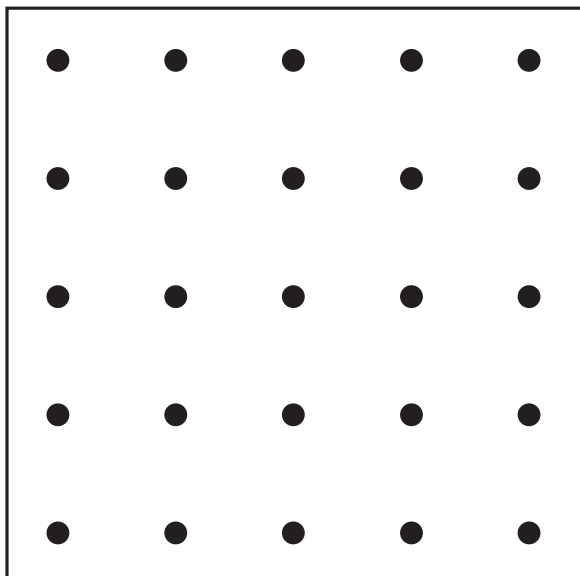
Score: Blue \_\_\_\_\_ Red \_\_\_\_\_

**Game 2**



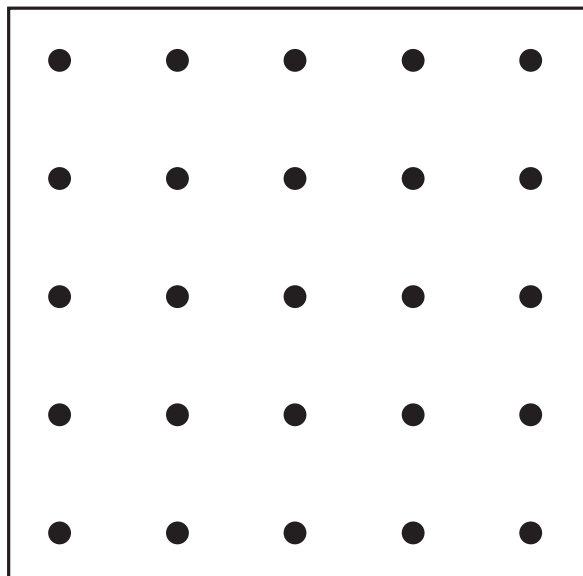
Score: Blue \_\_\_\_\_ Red \_\_\_\_\_

**Game 3**



Score: Blue \_\_\_\_\_ Red \_\_\_\_\_

**Game 4**

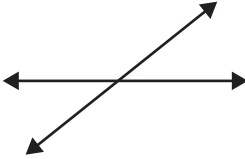
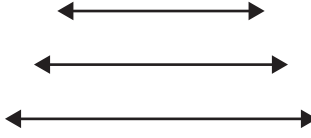
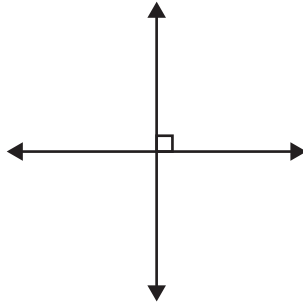


Score: Blue \_\_\_\_\_ Red \_\_\_\_\_

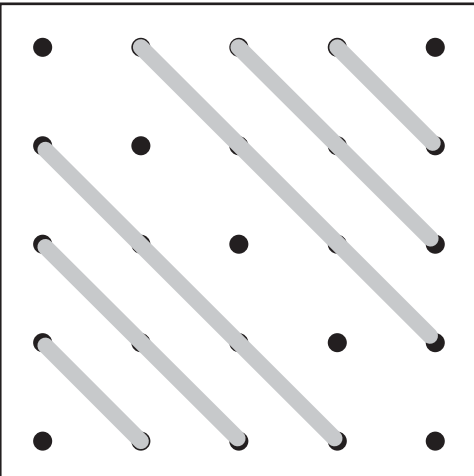
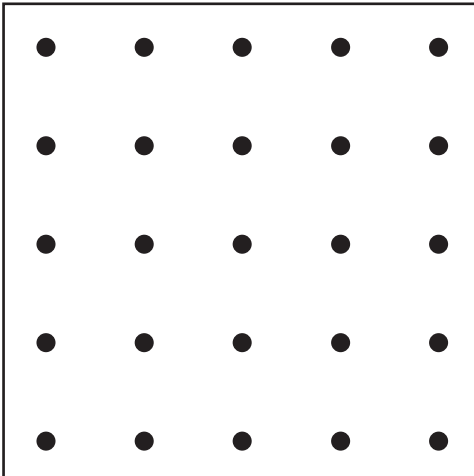


# Lines & Designs

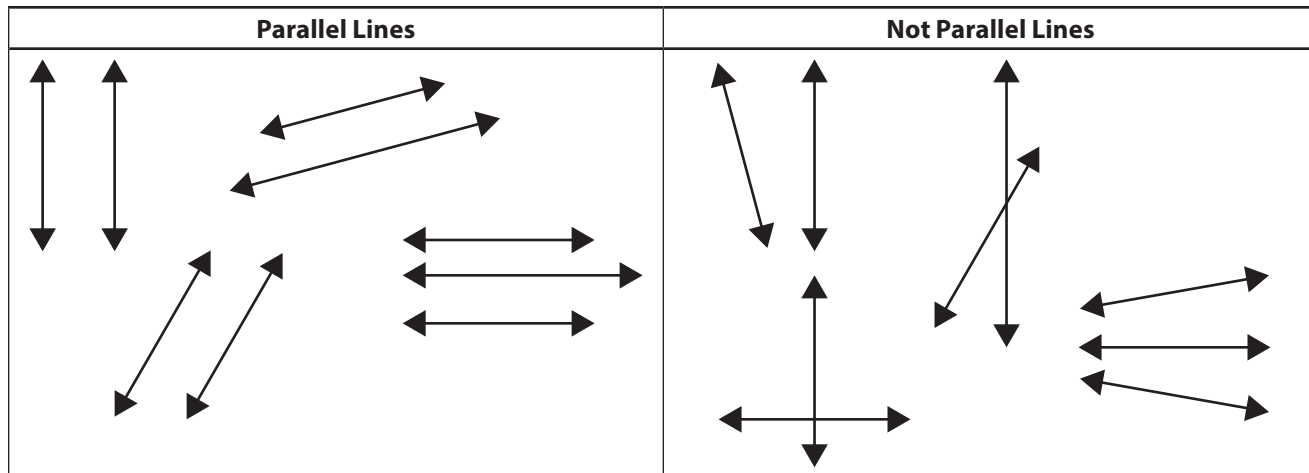
**1** Fill in the bubbles in front of the words that describe each set of lines below. Then explain your answer. How do you know? The first one is done for you.

<p><b>ex</b></p>  <p> <input checked="" type="radio"/> intersecting lines  <input type="radio"/> parallel lines  <input type="radio"/> perpendicular         </p> <p>How do you know?</p> <p>These are intersecting lines because they cross. They are not perpendicular because they don't cross at right angles.</p>	<p><b>a</b></p>  <p> <input type="radio"/> intersecting lines  <input type="radio"/> parallel lines  <input type="radio"/> perpendicular         </p> <p>How do you know?</p>	<p><b>b</b></p>  <p> <input type="radio"/> intersecting lines  <input type="radio"/> parallel lines  <input type="radio"/> perpendicular         </p> <p>How do you know?</p>
---	---	--

**2** Get a geoboard and some colored rubber bands. Use them to make each of the designs described below. Then use regular and colored pencils to record your work on this sheet.

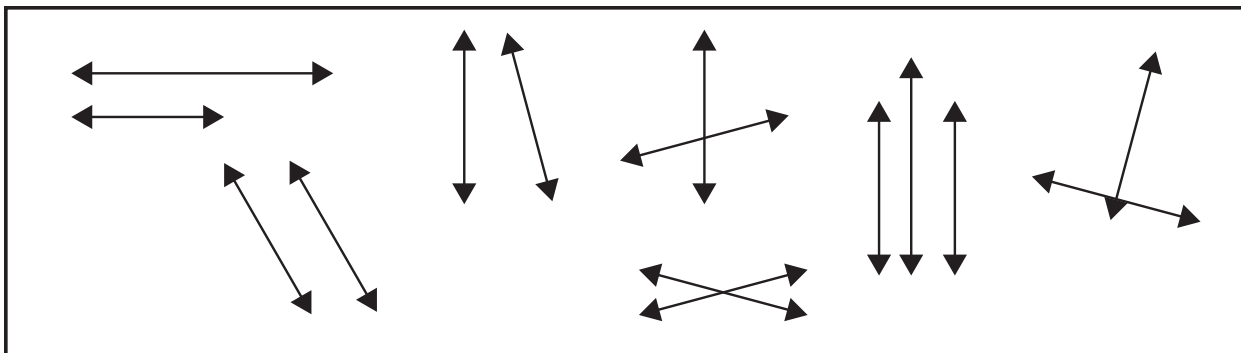
<p><b>ex</b> Make a design with 6 gray parallel line segments.</p> 	<p><b>a</b> Make a design with 6 red intersecting line segments.</p> 
--	---

 **Thinking About Lines** page 1 of 2



**1** Study the diagram above. Use it to help answer the questions below.

**a** Circle all the examples of parallel lines in the box.



**b** How do you know that the figures you circled are examples of parallel lines?

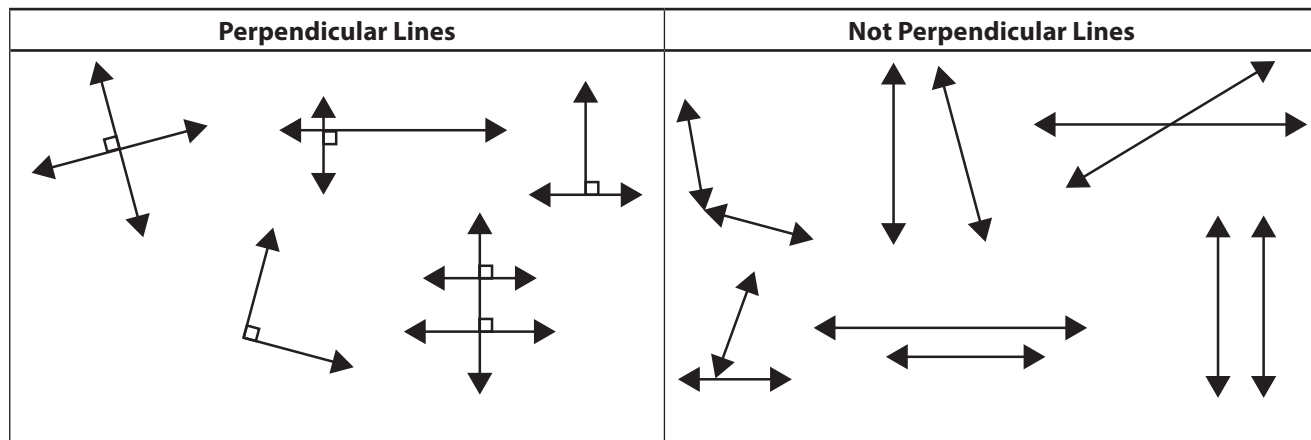
**c** Draw 2 examples of parallel lines.

**d** Draw 2 examples of lines that are not parallel.

**e** Write a definition for the term *parallel lines*.

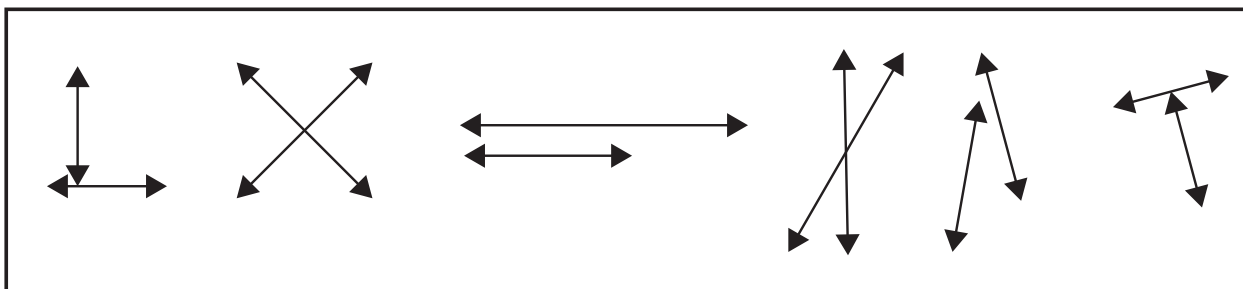
*(continued on next page)*

**Thinking About Lines** page 2 of 2



**2** Study the diagram above.

**a** Circle all the examples of perpendicular lines in the box. (Hint: Use the corner of a piece of paper or a tile to check the angles.)



**b** How do you know the figures you circled are examples of perpendicular lines?

**c** Draw 2 examples of perpendicular lines.

**d** Draw 2 examples of lines that are not perpendicular.

**e** Write a definition for the term *perpendicular lines*.

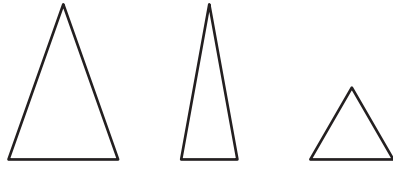
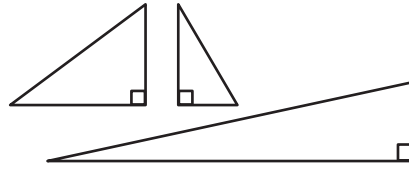
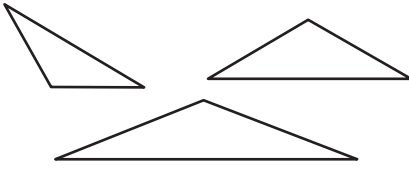
NAME \_\_\_\_\_

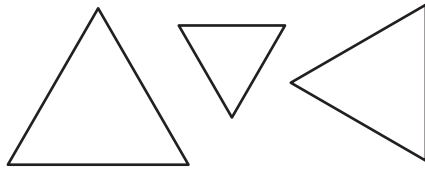
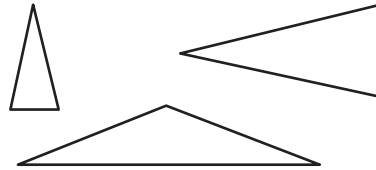
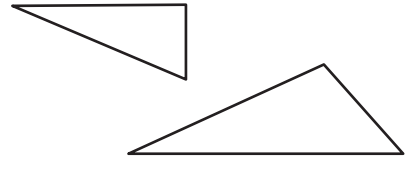
DATE \_\_\_\_\_



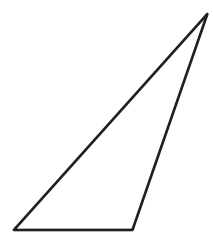
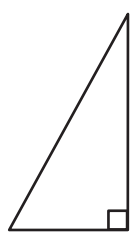

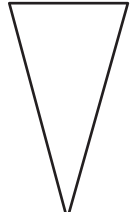

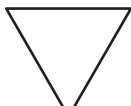
# Thinking About Triangles

Use the following information to help solve the problems below.

You can group triangles by the size of their angles.		
<p><b>Acute Triangles</b></p>  <p>all 3 angles are acute</p>	<p><b>Right Triangles</b></p>  <p>1 angle is a right angle</p>	<p><b>Obtuse Triangles</b></p>  <p>1 angle is an obtuse angle</p>

You can also group triangles by the lengths of their sides.		
<p><b>Equilateral Triangles</b></p>  <p>all 3 sides are the same length</p>	<p><b>Isosceles Triangles</b></p>  <p>2 sides are the same length</p>	<p><b>Scalene Triangles</b></p>  <p>no sides are the same length</p>

**1** Fill in the bubble to show what kind of triangle each one is.

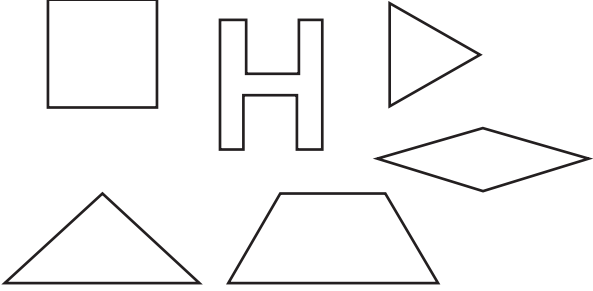
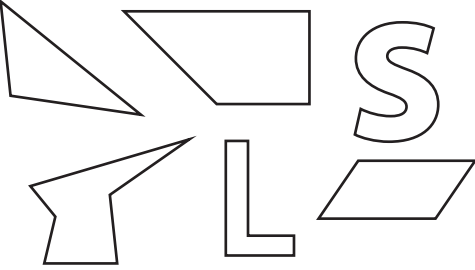
<p><b>a</b></p> <p><input type="radio"/> acute</p> <p><input type="radio"/> right</p> <p><input type="radio"/> obtuse</p>		<p><b>b</b></p> <p><input type="radio"/> acute</p> <p><input type="radio"/> right</p> <p><input type="radio"/> obtuse</p>	
<p><b>c</b></p> <p><input type="radio"/> acute</p> <p><input type="radio"/> right</p> <p><input type="radio"/> obtuse</p>		<p><b>d</b></p> <p><input type="radio"/> equilateral</p> <p><input type="radio"/> isosceles</p> <p><input type="radio"/> scalene</p>	
<p><b>e</b></p> <p><input type="radio"/> equilateral</p> <p><input type="radio"/> isosceles</p> <p><input type="radio"/> scalene</p>		<p><b>f</b></p> <p><input type="radio"/> equilateral</p> <p><input type="radio"/> isosceles</p> <p><input type="radio"/> scalene</p>	

NAME \_\_\_\_\_

DATE \_\_\_\_\_

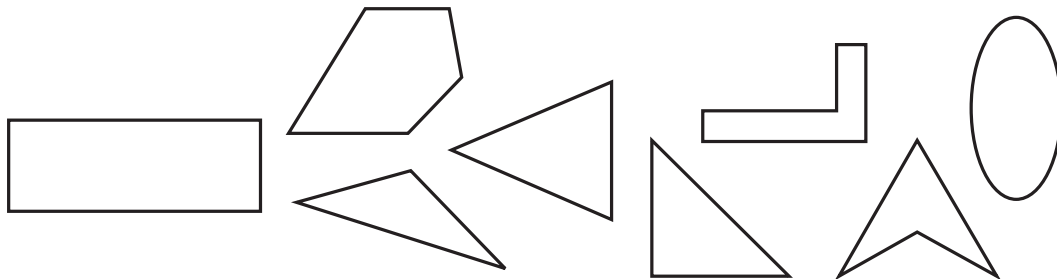


## Thinking About Line Symmetry

Symmetrical Figures	Asymmetrical Figures
 <p>These figures all have at least one line of symmetry.</p>	 <p>These figures have no lines of symmetry.</p>

**1** Study the diagram above. Use it to help answer the questions below.

- a** Circle all the shapes below that have at least one line of symmetry. Use a colored pencil and a ruler to draw in the lines of symmetry on the shapes you circled.



- b** Draw two shapes of your own that have at least one line of symmetry. Use a different color pencil to draw in the line(s) of symmetry on each.
- c** Draw two shapes of your own that have no lines of symmetry.
- d** Write a definition for the term *line of symmetry*.



# Work Place Instructions 5B Mosaic Game

## Each pair of players needs:

- pattern blocks
- 1 die numbered 1–6
- 2 colored pencils
- 2 rulers
- 5B Mosaic Game Record Sheet for each player

- 1 Each player rolls the die. The player with the higher roll goes first.
- 2 The player rolls the die three times. For each roll, she takes a pair of pattern blocks. The Pattern Block Key on the record sheet shows which pair of pattern blocks to take for each number on the die.

Unit 5 Module 2 | Session 3 class set plus more as needed, stored in the Work Place tray

NAME \_\_\_\_\_ | DATE \_\_\_\_\_

**5B Mosaic Game Record Sheet**

Player 1 \_\_\_\_\_ Player 2 \_\_\_\_\_

Pattern Block Key						
Number rolled	1	2	3	4	5	6
Take two of this block:						



- 3 Then the player makes a design with the six pattern blocks. She gets a point for every line of symmetry in the design.
- 4 Both players—the one who made the design and her partner—sketch the design on their record sheets and draw in the line(s) of symmetry.

Pattern Block Key						
Number rolled	1	2	3	4	5	6
Take two of this block:						
Round 1				Round 2		

- 5 Players take turns until each player has gone twice. After two rounds, players add their total number of lines of symmetry.
- 6 The player with the higher total score wins.

## Game Variations

- A Partners collaborate on a design and help each other find the lines of symmetry.
- B Players use the Mosaic Game Challenge page.
- C Players take 1 or 3 pattern blocks with each roll instead of 2, so they end up with a total of 3 or 9 blocks instead of 6. What happens? Is it easier or harder to make symmetrical shapes with more or fewer pieces? Is it easier or harder to make symmetrical shapes with an odd number of pieces rather than an even number?

NAME \_\_\_\_\_

DATE \_\_\_\_\_



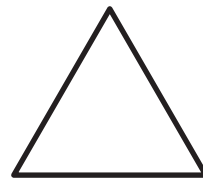
## Pattern Block Symmetries

For each of the shapes below:

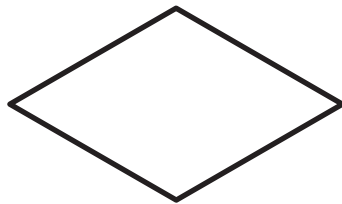
- Decide whether the shape has any lines of symmetry.
- Draw in all the lines of symmetry you can find.

**1**

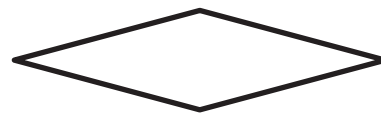
isosceles trapezoid

**2**

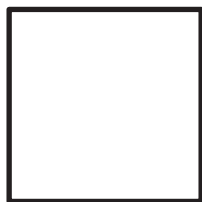
equilateral triangle

**3**

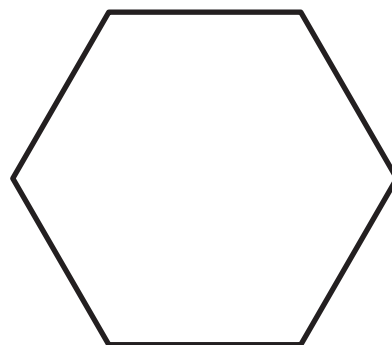
rhombus

**4**

rhombus

**5**

square

**6**

regular hexagon



NAME \_\_\_\_\_

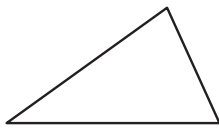
DATE \_\_\_\_\_



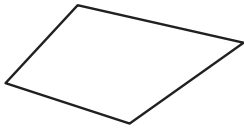
## Naming Polygons

### Naming Polygons

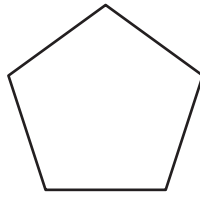
A polygon is a closed two-dimensional figure made up of 3 or more line segments. The name of a polygon depends on how many sides it has.



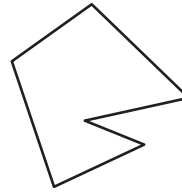
**Triangle**  
3 sides



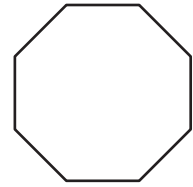
**Quadrilateral**  
4 sides



**Pentagon**  
5 sides



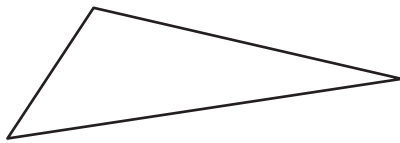
**Hexagon**  
6 sides



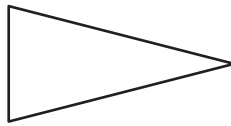
**Octagon**  
8 sides

### Naming Triangles

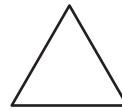
You can name a triangle by looking at its side lengths. You can also name a triangle by looking at its angles.



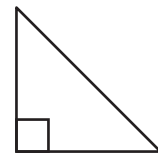
**Scalene Triangle**  
Each side is a different length.



**Isosceles Triangle**  
Two sides are the same length.



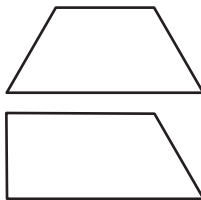
**Equilateral Triangle**  
All three sides are the same length.



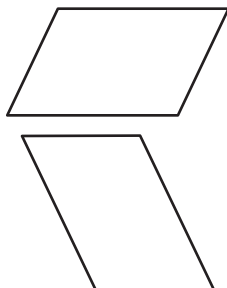
**Right Triangle**  
Has exactly one right angle.

### Naming Quadrilaterals

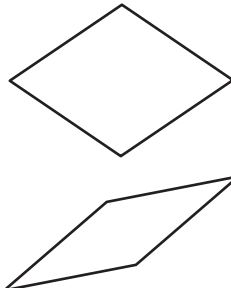
Any polygon with 4 sides is a quadrilateral, but some quadrilaterals have more than one name.



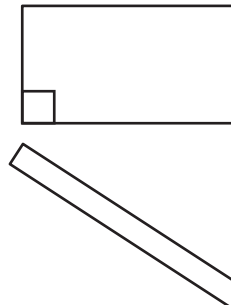
**Trapezoid**  
a quadrilateral with exactly 1 pair of parallel sides



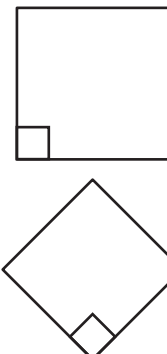
**Parallelogram**  
a quadrilateral with 2 pairs of parallel sides the same length



**Rhombus**  
a parallelogram with all 4 sides the same length



**Rectangle**  
a parallelogram with 4 right angles



**Square**  
a rectangle with all 4 sides the same length

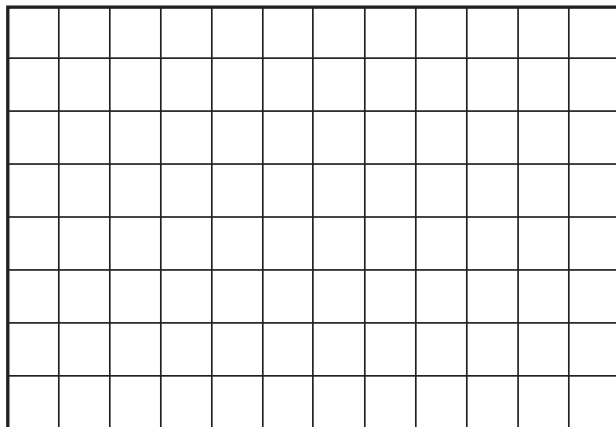
NAME \_\_\_\_\_

DATE \_\_\_\_\_

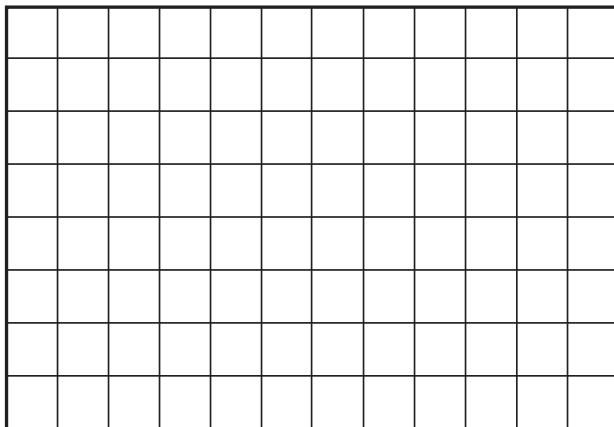


## Drawing Shapes

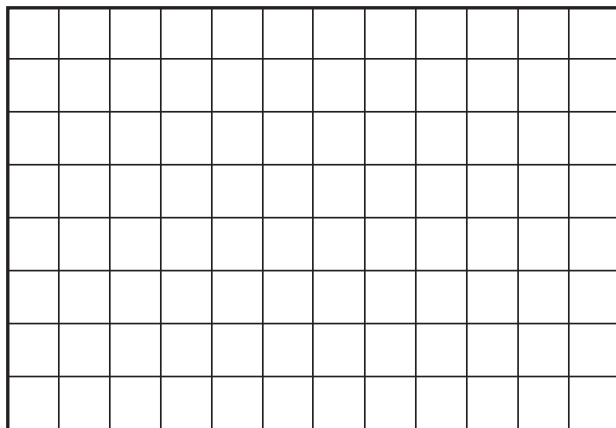
- 1** Draw a shape with 5 sides and 1 right angle.



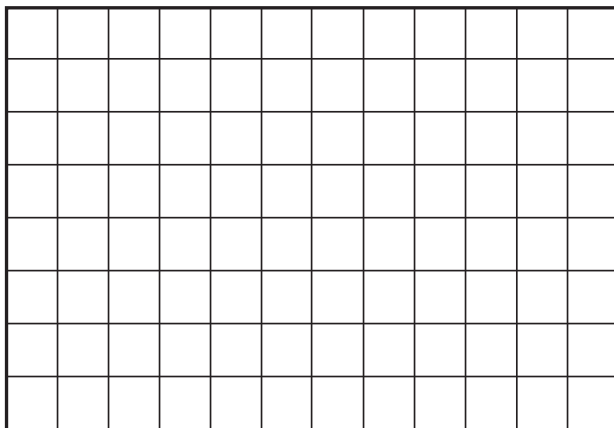
- 2** Draw a shape with only 2 parallel sides.



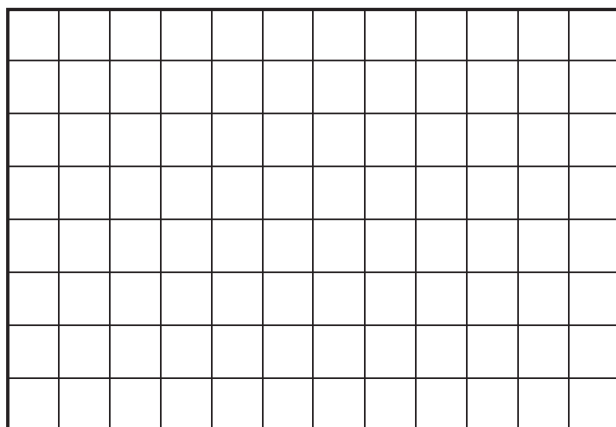
- 3** Draw a shape with 2 acute angles.



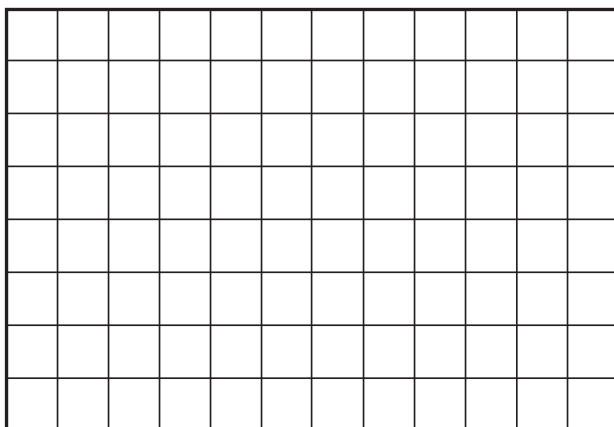
- 4** Draw a shape with only obtuse angles.



- 5** Draw a quadrilateral with 2 pairs of parallel sides.



- 6** Draw a quadrilateral with 4 congruent sides.





## Work Place Instructions 5C Solving Polygon Riddles

**This is a one-player game.**

**Each player needs:**

- 3 or more polygon riddles
- 1 index card, 3 × 5 inches
- an envelope of polygon cards
- a 5C Polygon Riddles Record Sheet

- 1** The player spreads out all of the polygon cards.
- 2** The player chooses one polygon riddle and places it under an index card.
- 3** The player moves the index card just enough to see only the first clue, then turns all of the polygon cards that don't fit the clue face-down.
- 4** The player continues to move the index card to reveal one clue at a time, turning polygon cards face-down until only one remains face-up.
- 5** The player checks to make sure the polygon on the final polygon card matches all of the clues, then records the answer to that polygon riddle on the correct line of the record sheet.
- 6** After choosing another riddle and turning all of the polygon cards face-up, the player repeats steps 1–5. Players may solve as many riddles as time allows.
- 7** When time is up, the player collects the polygon cards into the envelope, then returns it and the riddles to the Work Place 5C tray.  
The player keeps their Polygon Riddles Record Sheet in their Work Place folder.

### Game Variations

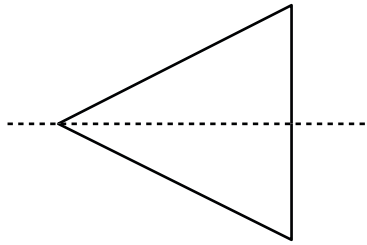
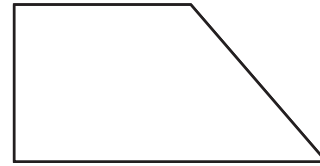
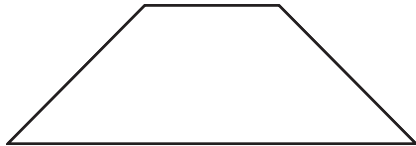
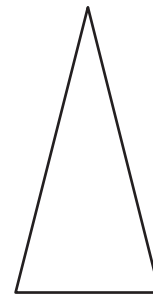
- A** Two players work as a team to solve each riddle. In that case, they use only one set of polygon cards.
- B** A player writes polygon riddles to match some of the polygon cards in the set, then challenges a partner to solve them.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Drawing Lines of Symmetry

**ex**This figure has   1   line(s) of symmetry**1**This figure has        line(s) of symmetry**2**This figure has        line(s) of symmetry**3**This figure has        line(s) of symmetry**4**This figure has        line(s) of symmetry**5**This figure has        line(s) of symmetry**6** Complete each equation about angles.

**a**  $30^\circ + \underline{\hspace{2cm}} = 180^\circ$

**b**  $4 \times 90^\circ = \underline{\hspace{2cm}}$

**c**  $270^\circ - 180^\circ = \underline{\hspace{2cm}}$

**d**  $90^\circ \div \underline{\hspace{2cm}} = 30^\circ$



## Work Place Instructions 5D Polygon Bingo

### Each pair of players needs:

- 1 set of polygon cards
- 5D Polygon Bingo Record Sheets for each player
- 2 Polygon Bingo Game Boards
- 30 game markers

- 1 Players shuffle the polygon cards and place them face-down in a stack.
- 2 Each player chooses a different Polygon Bingo Game Board to use.
- 3 Player 1 selects a card and reads the shape name aloud.
- 4 Player 1 draws the polygon on his record sheet and writes its name below the drawing. Player 2 verifies that the drawing and name are correct.

*Player 2 That looks right. Your rhombus has 4 sides and they're all the same length.*

Unit 5 Module 2 | Session 6 2 class sets, plus more as needed, stored in the Work Place tray

NAME Darik | DATE \_\_\_\_\_

5D Polygon Bingo Record Sheet

1 2   
Shape Name \_\_\_\_\_

- 5 Then Player 1 finds an attribute that describes the shape on the Polygon Bingo Game Board and places a game marker on it. Player 2 verifies that the shape has the attribute described.

*Player 1 I made a rhombus. That has all equal sides. I can cover that one.*

Unit 5 Module 2 | Session 6 1 class set run on colored copy paper, stored in the Work Place tray

5D Polygon Bingo Boards

Board 1				Board 2			
2 sets of parallel lines, and all sides the same length	2 sides the same length	No sets of parallel lines	At least 2 obtuse angles	All right angles	All sides the same length	At least 2 obtuse angles	1 set of perpendicular lines

- 6 Play continues, with players taking turns repeating steps 3, 4, and 5.
- 7 The game continues until one player has covered a complete line of boxes (horizontal, vertical, or diagonal) on the game board. If Player 1 is the first player to complete a line, Player 2 can take one more turn to see if she can also complete a line and make it a tie game.

### Game Variation

- A** Players try to cover the entire game board.

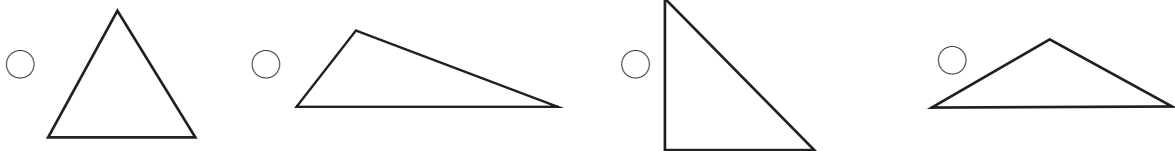
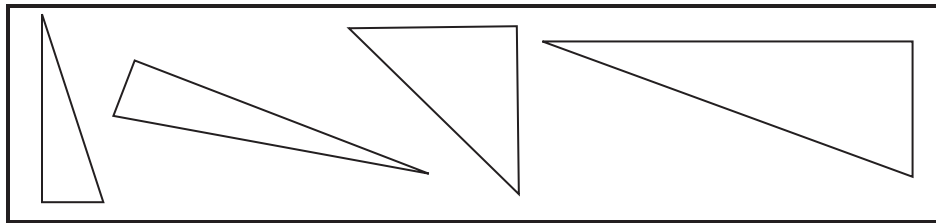
NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Classifying Triangles & Quadrilaterals

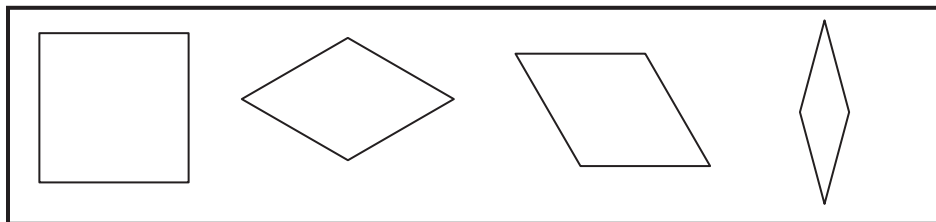
- 1** All of the triangles in the box have something in common. Fill in the circle next to the triangle that belongs with them.



- a** How do you know the triangle you picked belongs in the group?

- b** What is the name for this kind of triangle?

- 2** All of the quadrilaterals in the box have something in common. Fill in the circle next to the quadrilateral that belongs with them.



- a** How do you know the quadrilateral you picked belongs in the group?

- b** What is the name for this kind of quadrilateral?

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Measuring Area

Find the area of each item listed below.	<b>Dimensions</b> <i>(Measure to the nearest inch and show your units in inches or feet.)</i>	<b>Area</b> <i>(Show your work and label the answer with the correct units.)</i>
<b>ex</b> A piece of blue construction paper	Length = 18" Width = 10"	$18" \times 10" = 180 \text{ sq. in.}$
<b>1</b> Your math journal		
<b>2</b> Your desk or table		
<b>3</b> A geoboard		
<b>4</b> Calendar Grid pocket chart		
<b>5</b> The top of a bookshelf		
<b>6</b> The front of a chapter book		
<b>7</b> A Calendar Grid marker		
<b>8</b> A work table larger than the one where you sit		
<b>9</b> The whiteboard		
<b>10</b> <b>CHALLENGE</b> The classroom		



## Area Problems

- 1 Frank bought a rug for his room. It is 60 inches by 40 inches. What is the total area of the rug in square inches? Use labeled sketches, numbers, or words to solve this problem. Show all your work.
  
- 2 The school gym is 80 feet by 50 feet. What is the total area of the gym floor in square feet? Use labeled sketches, numbers, or words to solve this problem. Show all your work.
  
- 3 **CHALLENGE** Lisa's room is 90 inches by 90 inches. She bought a rug for her floor that is 50 inches by 40 inches. How much of her floor is not covered by the rug? Use labeled sketches, numbers, or words to solve this problem. Show all your work.



NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Measuring Perimeter

Find the perimeter of each item listed below.	Side Lengths (Include units: inches, feet, or yards.)	Circle the formula you need to find the perimeter.	Perimeter (Show your work and label the answer with the correct units.)
<b>ex</b> A piece of green construction paper	9 inches and 12 inches	$P = 2w + 2l$ $P = 4s$	$(2 \times 9) +$ $(2 \times 12) = 42 \text{ in.}$
<b>1</b> Your math journal		$P = 2w + 2l$ $P = 4s$	
<b>2</b> Your desk or table		$P = 2w + 2l$ $P = 4s$	
<b>3</b> A geoboard		$P = 2w + 2l$ $P = 4s$	
<b>4</b> Calendar Grid pocket chart		$P = 2w + 2l$ $P = 4s$	
<b>5</b> The top of a bookshelf		$P = 2w + 2l$ $P = 4s$	
<b>6</b> A base ten mat		$P = 2w + 2l$ $P = 4s$	
<b>7</b> The whiteboard		$P = 2w + 2l$ $P = 4s$	
<b>8</b> The classroom		$P = 2w + 2l$ $P = 4s$	

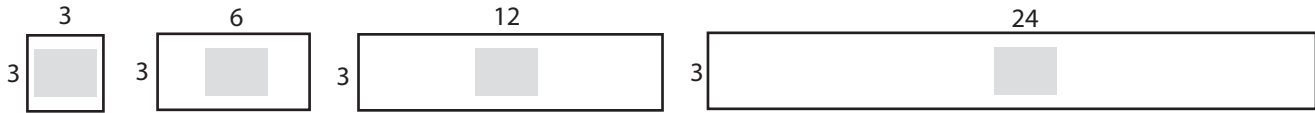
NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Thinking About Area

**1** Determine the area of each rectangle below. Write the area inside the rectangle.



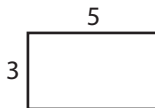
**a** Look at the rectangles above. What happens to the area of the rectangle when one of the dimensions is doubled?

**2** Determine the area of each rectangle below. Write the area inside the rectangle.



**a** Look at the rectangles above. What happens to the area of the rectangle when one of the dimensions is halved?

**3 CHALLENGE** What happens to the area of a rectangle when both dimensions are doubled? Start with this rectangle and then draw and label two more rectangles to show what happens.





## Area & Perimeter Formulas page 1 of 2

**1** Students are solving area and perimeter problems. Which kind of problems are they solving? Write “area” or “perimeter” next to each equation or statement below.

**a**  $25 + 76 + 25 + 76$  \_\_\_\_\_      **b**  $(2 \times 25) + (2 \times 76)$  \_\_\_\_\_

**c**  $25 \times 76$  \_\_\_\_\_      **d**  $50 \times 38$  \_\_\_\_\_

**e**  $(20 \times 76) + (5 \times 76)$  \_\_\_\_\_      **f** length  $\times$  width \_\_\_\_\_

**g** length + width + length + width \_\_\_\_\_

**h**  $2 \times$  length +  $2 \times$  width \_\_\_\_\_

**i** The answer is labeled in square units. \_\_\_\_\_

**j** The answer is labeled in linear units. \_\_\_\_\_

**2** Teri was finding the area and perimeter of a rectangle. She spilled ketchup on her work.

$$(2 \times \text{[blacked out]}) + (2 \times 99) = \text{[blacked out]}$$

$$(100 \times \text{[blacked out]}) - (1 \times 37) = \text{[blacked out]}$$

**a** Use the information in the picture above to draw Teri’s rectangle and label its dimensions.

**b** Write in the numbers that got covered with ketchup on Teri’s work. Also, circle the word to show whether each equation involves finding the area or the perimeter of the rectangle.

$(2 \times \text{[blacked out]}) + (2 \times 99) = \text{[blacked out]}$       area or perimeter?

$(100 \times \text{[blacked out]}) - (1 \times 37) = \text{[blacked out]}$       area or perimeter?

**Area & Perimeter Formulas** page 2 of 2

**3 CHALLENGE** Teri used an over strategy to multiply the dimensions of the rectangle. Show and describe a different multiplication strategy Teri could have used to find the area of the rectangle.

**4 CHALLENGE** The area of a rectangle is 4,500 square centimeters. One dimension is 30 cm and the perimeter is 360 cm. What is the other dimension? Show your work.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Area & Perimeter Problems

Find the area and perimeter of each figure. Show your work.

- 1** a rectangle with dimensions  $22 \times 89$  cm

<b>a</b> area =
<b>b</b> perimeter =

- 2** a square with side length 44 cm

<b>a</b> area =
<b>b</b> perimeter =

- 3** 130 miles

9 miles \_\_\_\_\_

<b>a</b> area =
<b>b</b> perimeter =

- 4** 5 km

125 km \_\_\_\_\_

<b>a</b> area =
<b>b</b> perimeter =

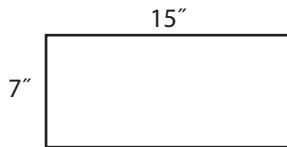
NAME \_\_\_\_\_

DATE \_\_\_\_\_

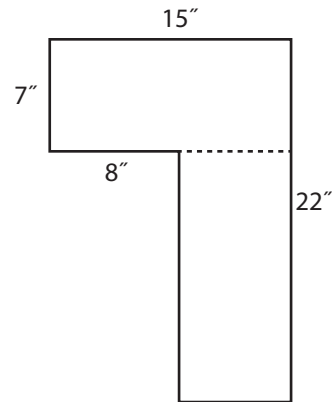


## Finding the Area & Perimeter of Complex Figures

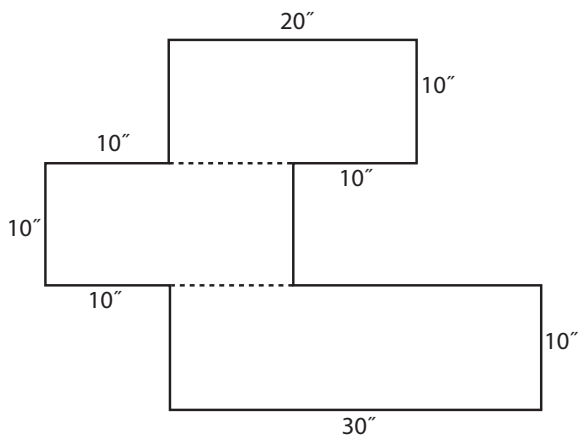
Determine the area and perimeter of each figure below. Some of the figures are divided into rectangles for you with dotted lines, but some aren't. You will need to figure out the missing lengths on some of the figures to find their perimeter. Show all your work.

**1**

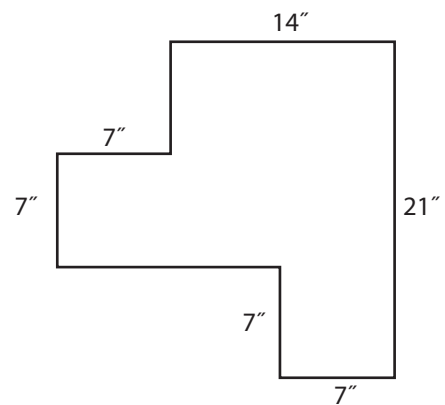
area = \_\_\_\_\_ perimeter = \_\_\_\_\_

**2**

area = \_\_\_\_\_ perimeter = \_\_\_\_\_

**3**

area = \_\_\_\_\_ perimeter = \_\_\_\_\_

**4**

area = \_\_\_\_\_ perimeter = \_\_\_\_\_

NAME \_\_\_\_\_

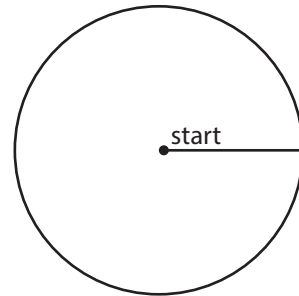
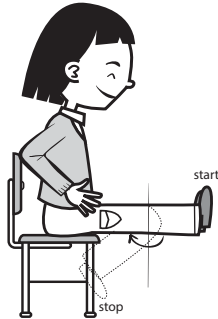
DATE \_\_\_\_\_



## Measuring the Range of Motion of Your Joints page 1 of 2

Work with a partner to test how much you can rotate each of the joints shown below. Each of you will sketch. First sketch the ending points of the joint's rotation. Then use your pattern blocks to estimate the degree of rotation to the nearest 10 degrees. When testing your joints, only bend as far as is comfortable: don't rotate your joints until it feels difficult or painful!

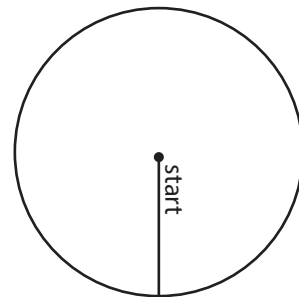
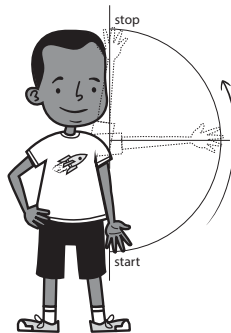
### 1 Knee



approximate degrees of rotation:

approximate fraction of a complete turn:

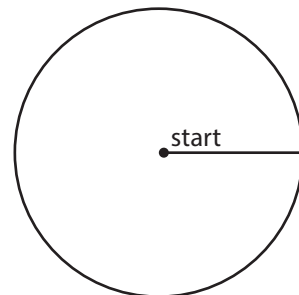
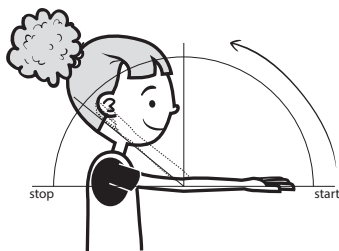
### 2 Shoulder: to the side



approximate degrees of rotation:

approximate fraction of a complete turn:

### 3 Elbow



approximate degrees of rotation:

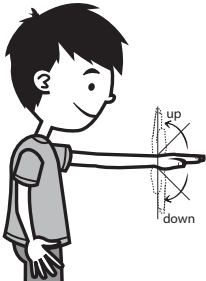
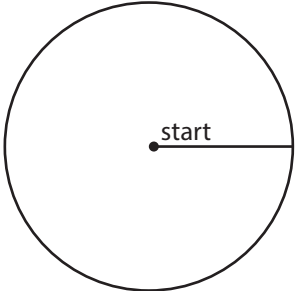
approximate fraction of a complete turn:

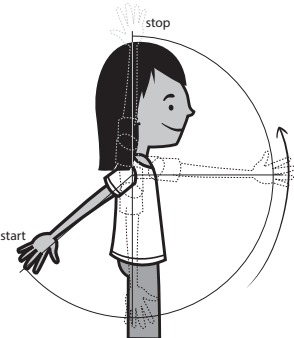
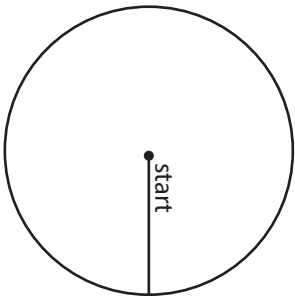
*(continued on next page)*

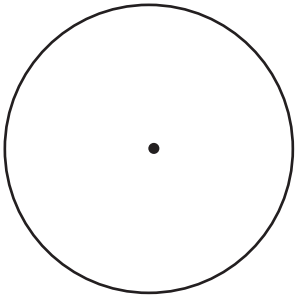
NAME \_\_\_\_\_

DATE \_\_\_\_\_

## Measuring the Range of Motion of Your Joints page 2 of 2

<b>4</b> Wrist		
approximate degrees of rotation:	approximate fraction of a complete turn:	

<b>5</b> Shoulder: back and front		
approximate degrees of rotation:	approximate fraction of a complete turn:	

<b>6</b> Your choice		
approximate degrees of rotation:	approximate fraction of a complete turn:	

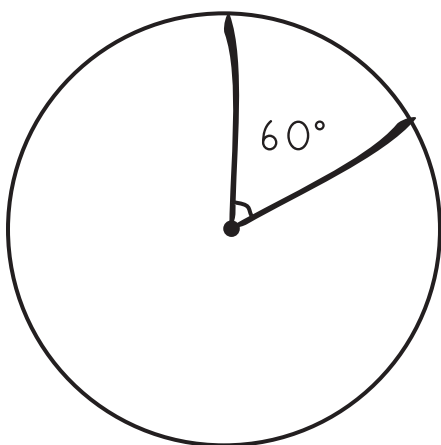




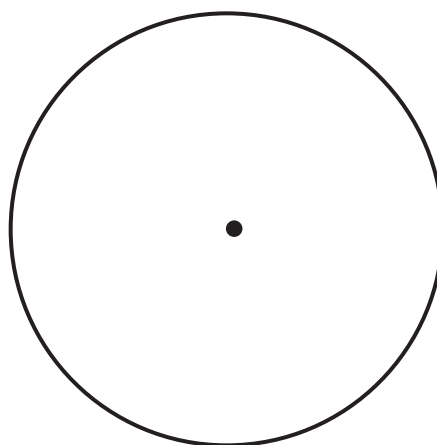
## Drawing Angles of Rotation

Draw and label the angles that are equal to each fraction of a whole turn around the circle. Use your pattern blocks to make the angles exact. Remember that there are 360 degrees in a full turn around the circle.

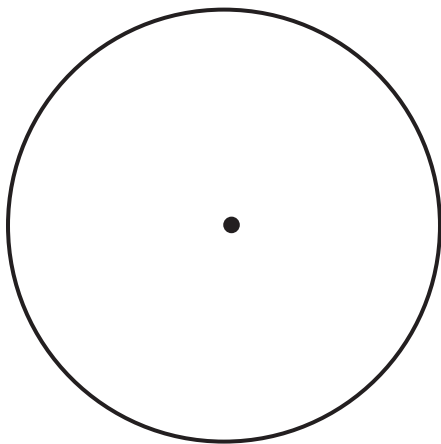
**ex** Draw and label  $\frac{1}{6}$  turn



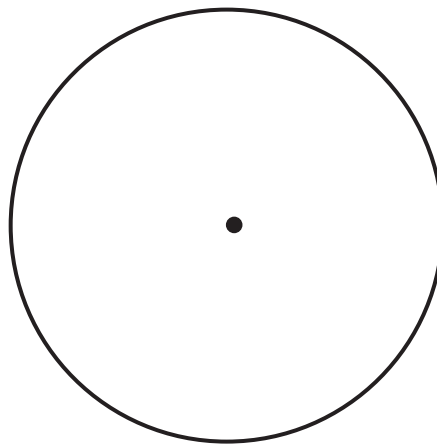
**1** Draw and label  $\frac{1}{2}$  turn



**2** Draw and label  $\frac{1}{4}$  turn



**3** Draw and label  $\frac{3}{4}$  turn





## Geometry Measurement Problems page 1 of 3

Mr. White asked some of his fourth graders to demonstrate making turns in their square-shaped classroom. Each of the students started their turn facing either the front or the back of the classroom.

**1** Mia started facing the front wall of the classroom. She turned  $60^\circ$  to the right. Then she turned  $60^\circ$  more to the right, and then  $60^\circ$  more.

**a** How many degrees did Mia turn in all? Use numbers and a labeled sketch to solve this problem.

**b** Which wall in the classroom was Mia facing when she stopped?

**2** Marcus started facing the back of the classroom. He turned  $360^\circ$ . Then he kept on turning in the same direction,  $180^\circ$  more.

**a** How many degrees did Marcus turn in all? Use numbers and a labeled sketch to solve this problem. Show all your work.

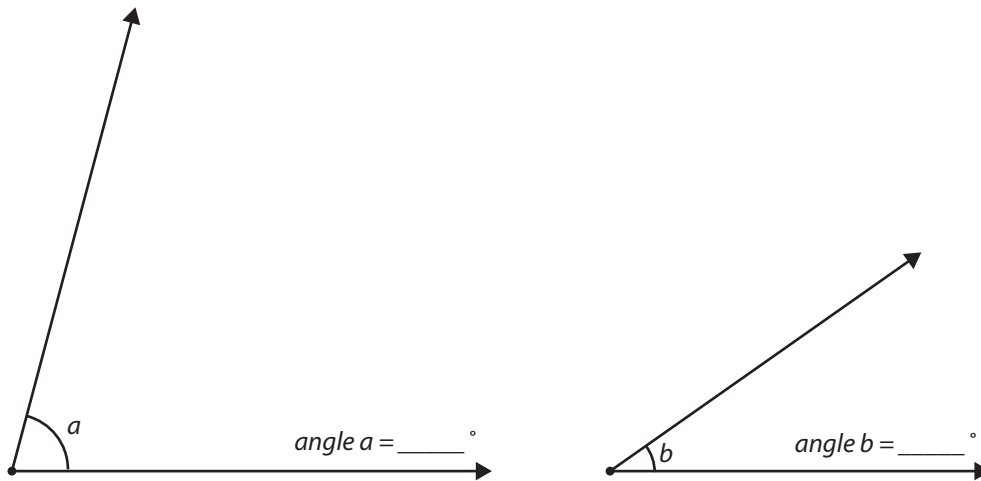
**b** Which wall in the classroom was Marcus facing when he stopped?

**Geometry Measurement Problems** page 2 of 3

- 3** Sara started facing the front of the classroom. She turned  $45^\circ$  to the left, and then kept on turning to the left— $80^\circ$  more, then  $45^\circ$  more, then  $120^\circ$  more. Did she turn all the way around in a complete circle, so she was facing the front of the room again? If not, how many more degrees would she need to turn to complete the circle? Use numbers and a labeled sketch to solve this problem. Show all your work.
- 4** Anthony started by facing the back wall of the classroom. He turned  $90^\circ$  to the right, and then 90 more degrees to the right. After that, he kept turning to the right,  $45^\circ$  more,  $45^\circ$  more, and  $45^\circ$  more. Did he turn all the way around in a complete circle? If not, how many more degrees would he need to turn to complete the circle? Use numbers and a labeled sketch to solve this problem. Show all your work.

**Geometry Measurement Problems** page 3 of 3

- 5** Measure the two angles with your protractor. What is the difference between the measure of angle  $a$  and angle  $b$ ?



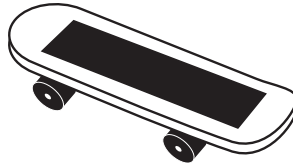
The difference between the measure of angle  $a$  and angle  $b$  is \_\_\_\_\_ degrees.

- 6 CHALLENGE** If the area of a rectangle is 240 and one dimension is 40, what is the other dimension? Use numbers and a labeled sketch to solve this problem.
- 7 CHALLENGE** If the perimeter of a rectangle is 90 and one dimension is 20, what is the other dimension? Use numbers and a labeled sketch to solve this problem.
- 8 CHALLENGE** Write two different combinations of six turns each so that the person who is turning ends up facing the same way he started.  
*Note* You don't have to stick with a single turn of  $360^\circ$  as long as the person who is turning ends up facing the same way he started.



## Turns & Fractions at the Skate Park

- 1** A group of kids were practicing tricks on their skateboards at the skate park. Solve the following problems about the kids and their skateboard tricks. Write and solve an equation for each problem.



- a** Molly made a turn on her board that was 3 times more than Todd's. Todd turned  $120^\circ$  on his board. How many degrees did Molly turn?

My Equation:

- b** How many more degrees did Molly turn than Todd?

My Equation:

- c** Teri turned  $160^\circ$  on her board. Lana made a turn that was  $\frac{1}{4}$  that much. How many degrees did Lana turn on her board?

My Equation:

- d** How many more degrees did Teri turn than Lana?

My Equation:

- e** Pablo made a  $360^\circ$  turn on his board. His brother, Marco, made a turn that was  $\frac{1}{6}$  of Pablo's. How many degrees did Marco turn on his board?

My Equation:

- f** How many more degrees did Pablo turn than Marco?

My Equation:

- 2** Solve the following pairs of multiplication problems.

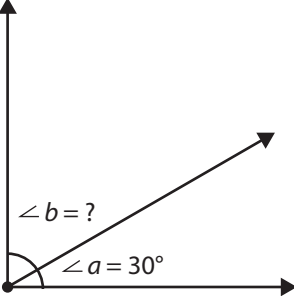
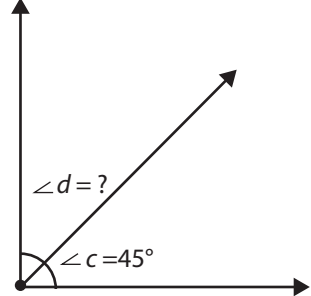
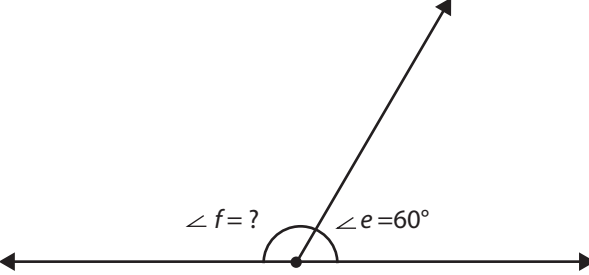
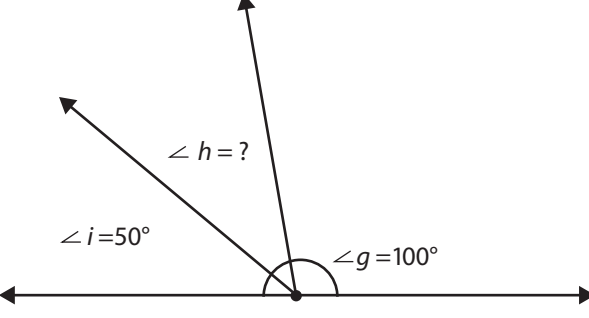
$$\frac{1}{2} \text{ of } 360 \text{ is } \underline{\hspace{2cm}} \quad \frac{1}{3} \text{ of } 360 \text{ is } \underline{\hspace{2cm}} \quad \frac{1}{4} \text{ of } 360 \text{ is } \underline{\hspace{2cm}} \quad \frac{1}{6} \text{ of } 360 \text{ is } \underline{\hspace{2cm}}$$

$$\frac{1}{2} \times 360 = \underline{\hspace{2cm}} \quad \frac{1}{3} \times 360 = \underline{\hspace{2cm}} \quad \frac{1}{4} \times 360 = \underline{\hspace{2cm}} \quad \frac{1}{6} \times 360 = \underline{\hspace{2cm}}$$



## Mystery Angles

- 1 Find the measure of each of the mystery angles below. (Hint: If you remember that a right angle measures  $90^\circ$  and a straight angle measures  $180^\circ$ , you may be able to solve some of these problems without a protractor.)

<p><b>a</b></p>  <p>mystery angle b = _____</p>	<p><b>b</b></p>  <p>mystery angle d = _____</p>
<p><b>c</b></p>  <p>mystery angle f = _____</p>	
<p><b>d</b></p>  <p>mystery angle h = _____</p>	

- 2 Jami knows that when the clock says it's exactly 1:00, the hands make an angle of  $30^\circ$ . What angle is formed by the hands on the clock when it's exactly 5:00? Use numbers, labeled sketches, or words to explain your answer.



## Shapes & Angles

**1** Using a protractor, sketch the following shapes with the correct angles.

**a** a triangle with two  $50^\circ$  angles

**b** a triangle with a right angle and  $30^\circ$  and  $60^\circ$  angles

**2** If a quadrilateral has angles that are all the same size, what name(s) might it have?

**3** If a quadrilateral has side lengths that are all the same size, what name(s) might it have?

### Review

**4** Is 7 a factor of 27?

**5** Is 7 a factor of 41?

**6** Is 7 a factor of 49?

**7** List the factors of 100.



## Quimby's Quadrilaterals

- 1 Quimby looked at a rectangle and said, "This rectangle is also a parallelogram." Can a parallelogram also be a rectangle? Explain.
  
- 2 Quimby's apartment complex has a playground in the shape of a quadrilateral. The perimeter of the playground is 210 feet. The lengths of three of the sides are 50 feet, 60 feet, and 30 feet. How long is the fourth side of the playground? Show your work.
  
- 3 Quimby looked at a trapezoid. The trapezoid had one set of parallel sides and two right angles. Draw a trapezoid with one set of parallel sides and two right angles.
  
- 4 Complete the number pattern below.  
 $\frac{1}{4}, \frac{1}{2}, \underline{\hspace{1cm}}, 2, 4, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, 32, \underline{\hspace{1cm}}, 128$
- 5 What is the rule for the number pattern?
  
- 6 Show a number pattern for the following rule:  $\times 2, - 1$ .  
\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_





## Money Story Problems page 1 of 2

Story Problem Instructions:

- Work with a partner to share ideas and problem-solving strategies.
- Use numbers, labeled sketches, or words to model and solve each problem.
- Show all your work, as well as the answer.
- You do not have to work the problems in order.

**1** Mrs. Sanchez gave her three grandchildren \$78.00 to share equally. How much money did each grandchild receive?

**2** James, Kendra, Nick, and Natasha spent \$56.00 to buy a present for their Aunt Jane. If they all contributed the same amount, how much did each person contribute?

**3** Students at Shoreham School held a bake sale to raise money to buy books. They earned \$90. If five classes share the money equally, how much will each class get?

*(continued on next page)*

**Money Story Problems** page 2 of 2

- 4** Morgan had \$120 in his bank account. He took out half the money and spent it on books. If each book cost \$15, how many books did he buy?
- 5** If 12 cans of dog food cost \$9.50, how much would 6 cans cost?
- 6** Tanya and three friends have saved \$75 to help protect the pandas. If they each gave the same amount, how much money did each person contribute?
- 7** Five friends shoveled snow from people's driveways. They charged \$4.00 per driveway. At the end of the month, they divided the money equally and each got \$24. How many driveways did they shovel?



## Find or Write the Matching Equation

- 1** Draw a line from each problem situation to the equation that best matches it.

Nina had 2 cats. They had kittens, and now Nina has 8 cats. How many kittens did they have?

$$8 \div k = 2$$

Tim had 8 kites. He gave them to his friends. Each friend got 2 kites. How many friends did Tim give kites to?

$$8 - k = 2$$

Kaylee had 8 keys on her keychain. She got rid of some of them, and now she has 2 keys left. How many keys did she get rid of?

$$2 \times k = 8$$

Takumi was tying knots. He tied the same number of knots on 2 different pieces of string. When he was done, he had tied 8 knots. How many knots did he tie on each piece of string?

$$2 + k = 8$$

- 2** Write an equation, inequality, or expression to show each situation.

Joe and Keira were putting their money together to buy a present for their mom. Joe had \$15 and together they had more than \$30.

$$\$15 + k > \$30$$

Esteban was organizing his rock collection. He put the same number of rocks into each box. He had 30 rocks and 5 boxes. How many rocks did he put into each box?

Ebony made 9 bracelets. She gave each of her 3 friends the same number of bracelets. How many bracelets did each friend get?

Gregory had \$45. His sister asked to borrow some money. Gregory gave her some money, but he still had more than \$30 left.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Jeremy's Birthday

- 1** Jeremy and his mom are getting ready for his birthday party. His mom got 31 balloons for the party.
- a** If Jeremy divides the balloons evenly among 4 tables, how many balloons will each table get? Show your work.

Answer: \_\_\_\_\_

- b** How did you handle the remainder in this problem?
- Left it as a whole number.
  - Turned it into a fraction.
  - Turned it into a decimal number.
- c** Explain your choice.
- 2** Jeremy got \$53.00 from his grandparents for his birthday. He wants to spend exactly half of the money on a new toy, and put the other half in his savings account.
- a** How much money will Jeremy put into his savings account? Show your work.

Answer: \_\_\_\_\_

- b** How did you handle the remainder in this problem?
- Left it as a whole number.
  - Turned it into a fraction.
  - Turned it into a decimal number.
- c** Explain your choice.



## More Multiplication Strategies

**1** Solve the problems.

$1 \times 17 = \square$

$19 \times 17 = \square$

$2 \times 17 = \square$

$18 \times 17 = \square$

$10 \times 17 = \square$

$100 \times 17 = \square$

$9 \times 17 = \square$

$99 \times 17 = \square$

$20 \times 17 = \square$

$98 \times 17 = \square$

**2** What do you notice about these problems? How did you solve them?

**3** Write and solve your own series of related problems. You can choose any 2-, 3-, or 4-digit number that doesn't end in a zero to be your multiplier.

$1 \times \square = \square$

$19 \times \square = \square$

$2 \times \square = \square$

$18 \times \square = \square$

$10 \times \square = \square$

$100 \times \square = \square$

$9 \times \square = \square$

$99 \times \square = \square$

$20 \times \square = \square$

$98 \times \square = \square$

**4** Now write one more combination using your multiplier that can be solved using the problems you wrote. Find the answer and explain how you got it.



## Multiplication Strategies

**1** Solve the problems below. Show your work with numbers, labeled sketches, or words.

**a**  $1 \times 42 =$

**b**  $2 \times 42 =$

**c**  $10 \times 42 =$

**d**  $20 \times 42 =$

**e**  $5 \times 42 =$

**f**  $15 \times 42 =$

**2** Choose problem **d**, **e**, or **f**. What strategies and models did you use to solve it?

**3** Edie says she can solve  $27 \times 99$  by solving  $27 \times 100$  and then taking away  $1 \times 27$ . Do you agree or disagree? Explain.

**4** What multiplication combinations might help you solve  $63 \times 99$ ?



## Zinnia's Garden

Think about the most efficient strategy for each problem. Then show your work using numbers, labeled sketches, or words.

- 1** Zinnia is planting her garden. She made 9 rows for carrots. She put 28 carrot seeds in each row. How many carrot seeds did she plant?
  
  
  
  
  
  
  
  
  
  
- 2** Zinnia has 15 pots for flowers. She planted 12 flower seeds in each pot. How many flower seeds did she plant?
  
  
  
  
  
  
  
  
  
  
- 3** Zinnia has 13 rows for tomatoes. She planted 29 tomato seeds in each row. How many tomato seeds did she plant?
  
  
  
  
  
  
  
  
  
  
- 4** **CHALLENGE** Zinnia planted 108 cucumber seeds in 6 different pots. How many cucumber seeds are in each pot?



## More Sports Challenges page 1 of 2

For each problem:

- Decide if the problem is best solved using multiplication or division.
- Write an equation with a letter to stand for the unknown number.
- Use a ratio table or a labeled area model to solve it. Show all of your work.

- 1** Alexandra brought water for her hockey team. There are 14 players on her team and she brought 24 ounces of water for each. How many ounces of water did she bring?

Equation: \_\_\_\_\_

Answer: \_\_\_\_\_

- 2** Mr. White, the gym teacher at Kennedy School, is planning Field Day for his students. He wants to organize the 280 students into teams of 8 for the different events. How many teams can he make?

Equation: \_\_\_\_\_

Answer: \_\_\_\_\_

*(continued on next page)*



NAME \_\_\_\_\_

DATE \_\_\_\_\_

**More Sports Challenges** page 2 of 2

- 3 CHALLENGE** Sasha's big sister is a long-distance runner and is participating in a marathon today. Sasha is helping at one of the stations along the race course that provides runners with water. So far, 129 runners have stopped to get water at Sasha's station. 75 of them each got 12 ounces of water. The others each got 18 ounces of water. How many ounces of water has Sasha given out so far today?

Equation: \_\_\_\_\_

Answer: \_\_\_\_\_

- 4 CHALLENGE** There are 8 ounces in a cup. How many cups of water has Sasha given out so far today?

Equation: \_\_\_\_\_

Answer: \_\_\_\_\_

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## More Multiplication Strings

**1a** Find the product on the left side of the page. Then use the information to find the products on the right side of the page.

$1 \times 34 = \underline{\hspace{2cm}}$

$3 \times 34 = \underline{\hspace{2cm}}$

$2 \times 34 = \underline{\hspace{2cm}}$

$5 \times 34 = \underline{\hspace{2cm}}$

$10 \times 34 = \underline{\hspace{2cm}}$

$30 \times 34 = \underline{\hspace{2cm}}$

$20 \times 34 = \underline{\hspace{2cm}}$

$15 \times 34 = \underline{\hspace{2cm}}$

**b** Find the product shown below. Explain how you got your answer.

$40 \times 34 = \underline{\hspace{2cm}}$

**2a** Write and solve your own series of related problems. You can choose any 2-, 3-, or 4-digit number that doesn't end in a zero to be your multiplier.

$1 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

$3 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

$2 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

$5 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

$10 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

$30 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

$20 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

$15 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

**b** Now write one more combination using your multiplier that can be solved using the problem you wrote. Find the answer and explain how you got it.

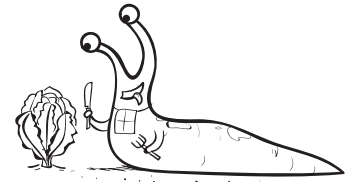
$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$



## The Slug's Lettuce Garden page 1 of 2

Look at the numbers in each problem before you begin to solve it. Think about which strategy would be the most efficient. Then solve the problem and show your work using numbers, labeled sketches, or words.

- 1** Last spring the Slug family decided to plant a lettuce garden. They marked off an area of 25 by 56 centimeters for their garden, and then they went to the Slug Garden Center and got 1,200 tiny lettuce plants. If each lettuce plant needs exactly 1 square centimeter of growing space, will they have enough room for all 1,200 plants?



- 2** The Slug family also wanted to plant tiny carrots. They marked off an area that was 26 by 32 centimeters for a carrot garden. Tiny carrots also need 1 square centimeter of growing space. How many tiny carrots can they plant in their tiny carrot garden?

- 3** Solve each problem using a strategy or combination of strategies that makes your work as easy as possible. Show all your work.

**a**

$$\begin{array}{r} 39 \\ \times 22 \\ \hline \end{array}$$

**b**

$$\begin{array}{r} 642 \\ \times 5 \\ \hline \end{array}$$

**c**

$$\begin{array}{r} 55 \\ \times 18 \\ \hline \end{array}$$

*(continued on next page)*

**The Slug's Lettuce Garden** page 2 of 2

**4 CHALLENGE** Write and solve a multiplication problem that looks hard but is actually easy if you use the doubling & halving strategy.

**5 CHALLENGE** Write and solve a multiplication problem that looks hard but is actually easy if you use the Five is Half of Ten strategy.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Baking Fun

**1** Sara and her 3 friends baked cookies last Saturday. By the end of the afternoon, they had made 7 dozen cookies.

- a** If they put 50 of the cookies in the freezer for the bake sale next week, and split the rest evenly among themselves to take home, how many cookies will each of the 4 friends get? Show your work.

Answer: \_\_\_\_\_

- b** How did you handle the remainder in this problem?

- Left it as a whole number.
- Turned it into a fraction.
- Turned it into a decimal number.

- c** Explain your choice.

**2** The butter for the cookies cost \$3.50. The chocolate chips cost \$4.50. The raisins cost \$2.00. Sara's mom donated the rest of the ingredients.

- a** If the 4 friends split the cost of the butter, chocolate chips, and raisins evenly, how much money did each friend have to pay?

Answer: \_\_\_\_\_

- b** How did you handle the remainder in this problem?

- Left it as a whole number.
- Turned it into a fraction.
- Turned it into a decimal number.

- c** Explain your choice.

**Area Challenges** page 1 of 2

- 1** A certain rectangle has an area of 693 square meters. This rectangle is 7 meters wide. How long is it?
- a** Make a sketch that shows what you know about the situation.
- b** Write an equation to represent the problem. \_\_\_\_\_
- c** Use an array or a ratio table to model and solve the problem. Show all of your work.
- 2** Use an array or a ratio table to model and solve problems 2a and 2b. Show all of your work.
- a** A paved bike trail has an area of 7,147 square feet. If the trail is 7 feet wide, how long is the trail?
- b**  $3,521 \div 7 = \underline{\hspace{2cm}}$

*(continued on next page)*

**Area Challenges** page 2 of 2

**3 CHALLENGE** Use a ratio table or an array to model and solve each of the problems below. Show all of your work. If you think you'll need more room, do these problems in your math journal.

**a**  $340 \div 8 = \underline{\hspace{2cm}}$

**b** Petra is raking leaves in her backyard. Petra's backyard is rectangular and has an area of 476 square feet. One side of the backyard is 28 feet. How long is the other side?

**c**  $900 \div 36 = \underline{\hspace{2cm}}$



## Quinn's Quilt

**1** Read each problem below. First make an estimate. Then write an equation with a letter standing for the unknown quantity. Finally, solve the problem. Show your work using numbers, labeled sketches, or words.

- a** Quinn made a quilt. The quilt is 72 inches by 96 inches. What is the area of Quinn's quilt?

Estimate: \_\_\_\_\_ Equation: \_\_\_\_\_

- b** Quinn made a pillowcase to go with her quilt. The area of the top of the pillowcase is  $189 \text{ in}^2$  (square inches). One dimension of the pillowcase is 9 inches. What is the other dimension?

Estimate: \_\_\_\_\_ Equation: \_\_\_\_\_

**2** Solve the following problems. Show your work.

$$25 \times 38 = \underline{\hspace{2cm}}$$

$$600 \div 8 = \underline{\hspace{2cm}}$$



 **String Rectangles**

Use your 60-inch length of string, some small bits of masking tape, a measuring tape, and numbers to help solve the problems below. Use equations and labeled sketches to show your work.

- 1** If you use your string to form a rectangle with one dimension of 24 inches, what is the length of the other dimension? Make a labeled sketch of the rectangle, and use one or more equations to find or check your answer.

The length of the other dimension is \_\_\_\_\_ inches.

- 2** If you use your string to form a rectangle with one dimension of 19 inches, what is the length of the other dimension? Make a labeled sketch of the rectangle, and use one or more equations to find and/or check your answer.

The length of the other dimension is \_\_\_\_\_ inches.

- 3** Jason says it's possible to form a square with a 60" length of string. Use a labeled sketch and one or more equations to prove that Jason is correct.

- 4** **CHALLENGE** How many different rectangles with dimensions that are whole numbers can you make with a 60" piece of string? List them in your journal, and record the answer here.

You can make \_\_\_\_\_ different rectangles with a 60" piece of string.



## Kaylee's Kilometers

Kaylee is training to run a marathon next summer. Help Kaylee figure out how far she is running each day. Show your work with numbers, labeled sketches, or words.

- 1** There is a rectangular path for running in Kaylee's town. She runs around the path every day. One side of the path is  $5\frac{1}{2}$  kilometers long. Another side is  $3\frac{1}{2}$  kilometers long.
  - a** What is the perimeter of the path?
  
  
  
  
  
  
  
  
  
  
  - b** If Kaylee ran around the path 7 times during one week, how many **kilometers** did she run that week?
  
  
  
  
  
  
  
  
  
  
  - c** How many **meters** did Kaylee run that week?
  
  
  
  
  
  
  
  
  
  
  - d** It takes Kaylee  $1\frac{5}{6}$  hours to run around the path. How many minutes does it take Kaylee to run around the path?
  
  
  
  
  
  
  
  
  
  
  - e** **CHALLENGE** Kaylee ran around the path  $1\frac{1}{2}$  times three days in a row. How far did she run on those three days in all?



## Work Place Instructions 6A Factors & Multiples

### Each pair of players needs:

- 2 colored pencils of different colors
- 6A Factors & Multiples Record Sheet (1 copy to share)

- 1 Player 1 chooses a target number on the game board by drawing a circle around it. This number represents Player 1's points for this round.
- 2 Using a different color, Player 2 circles all the numbers on the board that are factors of the target number, not including the target number itself. Player 2 adds these numbers together. The sum is Player 2's points for this round.

For example, if Player 1 chooses 14 as a target number, Player 2 would circle 1, 2, and 7 because they are all factors of 14. So, Player 1 has 14 points and Player 2 has 10 points so far.

Unit 6 Module 2 | Session 3 class set, cut in half, plus more as needed, stored in the Work Place tray

NAME \_\_\_\_\_ | DATE \_\_\_\_\_

**6A Factors & Multiples Record Sheet**

Player 1 Shayne Player 2 Cana

Factors & Multiples Game Board				
1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	20	21
22	24	25	26	27
28	30	32	34	36

- 3 Then Player 2 chooses and circles a new target number and Player 1 circles all the numbers that are factors of that number. Once a number on the game board has been circled, it may no longer be used.
- 4 Players take turns choosing target numbers and circling factors.  
If after completing a turn, a player realizes he missed a factor, he does not get to go back and cover that number.
- 5 When no further plays can be made, the game is over.
- 6 Each player then finds the sum of the numbers in her circled squares. The player with the greater total is the winner.

### Game Variations

- A A pair of players may play against another pair.
- B Players may create a game board that contains numbers greater than 36.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Perimeter Problems page 1 of 2

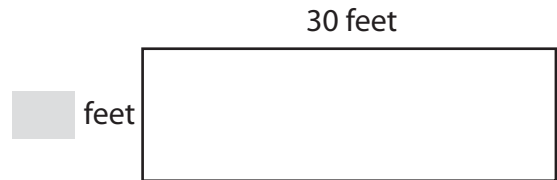
Use the perimeter and the known dimension to find the length of the missing dimension for each rectangle below. Show all your work.

### 1 Rectangle A

Perimeter = 72 feet

Dimension a = \_\_\_\_ feet

Dimension b = 30 feet

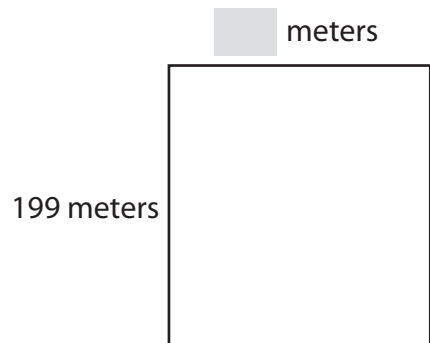


### 2 Rectangle B

Perimeter = 738 meters

Dimension a = 199 meters

Dimension b = \_\_\_\_ meters



### 3 Rectangle C

Perimeter = 500 miles

Dimension a = 125 miles

Dimension b = \_\_\_\_ miles

Make your own labeled sketch here.

*(continued on next page)*

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Perimeter Problems** page 2 of 2**4 Rectangle D**

Perimeter = 129 yards

Dimension a = \_\_\_\_\_ yards

Dimension b = 37 yards

Make your own labeled sketch here.

**5 CHALLENGE Rectangle E**

Perimeter = 3,465 meters

Dimension a = 952 meters

Dimension b = \_\_\_\_\_ meters

Make your own labeled sketch here.



## Finding Factors & Multiples

- Tell whether each of the following numbers is prime or composite.
  - 26 \_\_\_\_\_
  - 46 \_\_\_\_\_
  - 97 \_\_\_\_\_
  - 121 \_\_\_\_\_
- Write all of the factor pairs for each of the following numbers.
  - 34
  - 64
  - 72
  - 79
- Mandy was making a list of the multiples of 14. Which of the following lists is correct?
  - 14, 28, 41, 55
  - 28, 42, 56, 74
  - 28, 42, 56, 70
  - 14, 28, 42, 66
- The area of a large rectangular rug is 54 square feet. List all the possible pairs of dimensions for the rug.
- Which of the following lists contains a number that is **not** a multiple of 7?
  - 14, 28, 42, 56
  - 7, 14, 28, 35
  - 7, 21, 35, 64
  - 14, 21, 42, 56



## Work Place Instructions 6B Area or Perimeter

### Each pair of players needs:

- 1 die numbered 1–6 and 1 die numbered 4–9
- 1 more/less die
- 1 spinner overlay to share
- 6B Area or Perimeter Record Sheets (1 for each player)

- 1 Players decide who will go first. One player rolls the more/less die to find out if they are playing for more or less.
- 2 Player 1 chooses Dimension Spinner A or B and spins to get one known dimension.
- 3 Then Player 1 rolls both dice, multiplies the numbers rolled, and decides whether he wants the product to be the perimeter or the area.
  - The product of the roll has to be at least twice as much as the known dimension plus 2. For example, if a player spins a dimension of 6 and rolls  $3 \times 4$  for a product of 12, he must roll again until he gets a product or 14 or higher.
  - If the product is not a multiple of the known dimension, the player has to choose perimeter, not area. If the product is a multiple of the known dimension, the player can choose either perimeter or area.
- 4 Player 1 uses the known dimension and the perimeter or area to find the unknown dimension and records the information and work on his record sheet.  
Players must record a labeled sketch and one or more equations to show how they found the missing dimension.
- 5 After Player 1 has determined the unknown dimension, Player 2 checks to see if the dimension is correct. Player 1 corrects the dimension, if necessary.
- 6 Then Player 2 takes a turn and repeats steps 3–6.
- 7 Players take three turns each. At the end of the game, players add the unknown dimensions they found during the game. If they rolled “less” on the more/less die, the player with a smaller sum wins the game. If they rolled “more” on the more/less die, the player with a larger sum wins.

### Game Variations

- A Players can use 2 dice numbered 4–9.
- B Players who want to work with even larger products can use 2 dice numbered 4–9 and 1 die numbered 1–6, and multiply all 3 numbers they roll.
- C Instead of rolling the more/less die at the beginning of the game, players can set a target number for points and play until the first person reaches the target number. For example, if the target number is 50, players continue the game until one player’s unknown dimensions add up to 50 or more. If Player 1 reaches the target first, Player 2 gets one more turn to see if it’s a tie game.
- D Instead of rolling the more/less die at the beginning of the game, players can set a low target number and try to keep their final scores after three rounds below the target number. For example, if the target number is 10, players play three rounds and try to keep their scores under 10. The player with the lowest score wins.



## Area & Perimeter Challenges

Use labeled sketches and equations to model and solve each problem below. Show your work.

- 1** A rectangle has a perimeter of 84 meters. One dimension is 7 meters. How long is the unknown dimension?
  
  
  
  
  
  
  
  
  
  
- 2** If the perimeter of a rectangle is 24 cm and one dimension is 10 cm, what is the area?
  
  
  
  
  
  
  
  
  
  
- 3** **CHALLENGE** A rectangle has an area of 243 square feet. One dimension is 9 feet. What is the length of the other dimension? Draw a sketch and show your work.
  
  
  
  
  
  
  
  
  
  
- 4** **CHALLENGE** If the area of a rectangle is 36 square yards and one dimension is 12 yards, then what is the perimeter?







## Swimming Pool Times page 1 of 2

The school choir is planning their annual Swimming Pool Fundraiser where they sell tickets for a special party at a nearby pool. Last year Ben kept track of how long people stayed in the pool. He began to calculate each person's total time and he plotted the first five times on the line plot, but he hasn't finished yet.

- 1 Fill in the rest of the values in the last column of the chart.

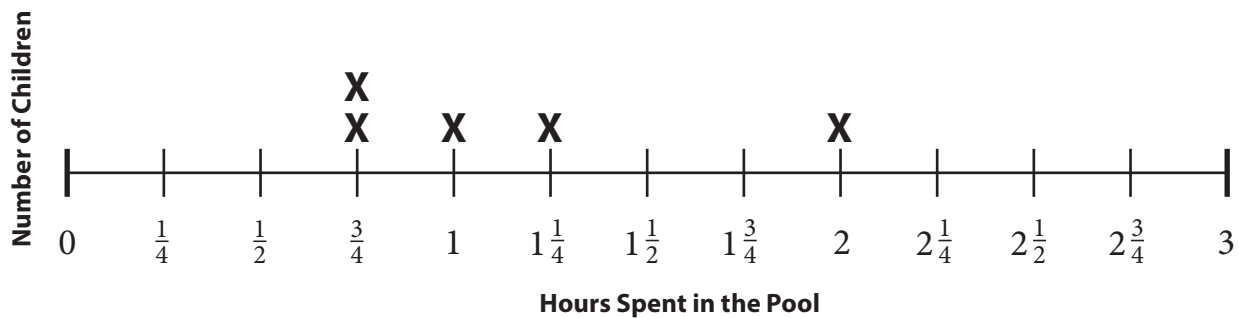
Last Year's Swimming Pool Times								
Children	Time In	Time Out	Total Hours in Pool		Children	Time In	Time Out	Total Hours in Pool
Tristan	4:05 pm	4:50 pm	$\frac{3}{4}$		Lucas	2:00 pm	3:00 pm	
Tamara	2:10 pm	3:10 pm	1		Craig	2:09 pm	3:39 pm	
Ben	3:00 pm	5:00 pm	2		Robert	3:10 pm	4:55 pm	
George	2:10 pm	3:25 pm	$1\frac{1}{4}$		Heather	2:45 pm	5:00 pm	
Henry	4:05 pm	4:50 pm	$\frac{3}{4}$		Melissa	2:55 pm	3:55 pm	
Rachel	2:15 pm	2:45 pm	$\frac{1}{2}$		Bridget	2:30 pm	3:45 pm	
Patty	2:25 pm	4:10 pm	$1\frac{3}{4}$		Mandy	2:30 pm	4:30 pm	
Kim	2:25 pm	4:55 pm	$2\frac{1}{2}$		Natalie	3:16 pm	4:46 pm	
Ryan	3:19 pm	4:49 pm	$1\frac{1}{2}$		Catalina	3:45 pm	5:00 pm	
Deborah	3:00 pm	4:30 pm	$1\frac{1}{2}$		Cesar	3:15 pm	5:00 pm	
Kelly	3:36 pm	4:36 pm	1		Jonathon	3:28 pm	4:58 pm	
Jason	2:00 pm	3:30 pm	$1\frac{1}{2}$		Riley	3:17 pm	4:32 pm	

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Swimming Pool Times** page 2 of 2

**2** Complete the line plot Ben started using the data from the chart.

**Analyzing the Line Plot**

**3** Calculate the total amount of time spent in the pool by the first five children.

**4** Complete the following using the line plot above.

- Circle and label the *minimum* and *maximum* amount of time spent in the pool.
- Determine and label the *range*, or the difference between the greatest and least value in the data. The range is \_\_\_\_\_.
- Find the *mode*, or value that appears most often. The mode is \_\_\_\_\_.
- Find the middle value, or *median*. The median is \_\_\_\_\_.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Factors & Multiples Moves

Factors & Multiples Game Board				
1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	20	21
22	24	25	26	27
28	30	32	34	36

- 1 Jasmine and Briana are playing Factors & Multiples. Jasmine chose 27 as her first target number and circled it. Briana gets to circle all of the factors of 27. What numbers does Briana get to circle?
- 2 Danny and Justin are also playing Factors & Multiples. Danny's first target number is 24. What numbers does Justin get to circle?
- 3 Bethany circled 1, 2, 4, and 8. What target number did Bethany's partner choose?
- 4 After Oscar chose his target number, his partner circled 1, 2, 3, 4, and 6. What was Oscar's target number?
- 5 Aaron is trying to decide if he wants to choose 14 or 18 as his first target number. Which number would give him a higher score than his partner? Explain your thinking.
- 6 List the prime numbers that are on the Factors & Multiples Game Board.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## The Swimming Contest

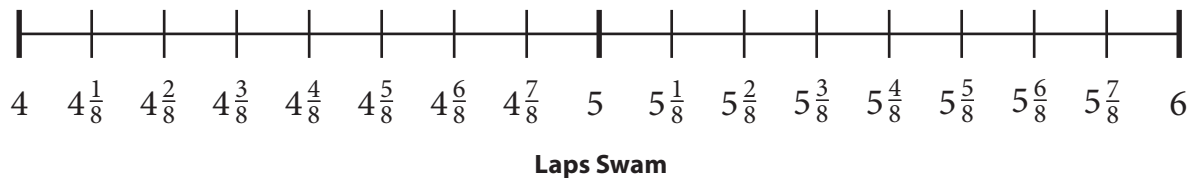
Sixteen of the kids who came to the Swimming Pool Fundraiser had a contest to see how many laps they could each swim in five minutes.

Student	Laps Swam
Melissa	$4\frac{3}{4}$
Robert	$5\frac{1}{8}$
Craig	$5\frac{1}{2}$
Tristan	$5\frac{1}{2}$
Ben	$4\frac{1}{4}$
Rachel	$4\frac{7}{8}$
Bridget	$4\frac{1}{4}$
Catalina	$5\frac{7}{8}$

Student	Laps Swam
Tamara	$4\frac{1}{4}$
Henry	$4\frac{1}{8}$
Kim	$4\frac{3}{8}$
Ryan	5
Jason	$5\frac{1}{4}$
Natalie	$5\frac{3}{4}$
Kelly	5
Riley	$5\frac{3}{8}$

- 1 Enter the data on the line plot below.

Number of Students



- 2 How many students swam  $5\frac{1}{8}$  laps or more?
- 3 How many students swam fewer than 5 laps?
- 4 What is the mode of this data?
- 5 Find the range of the data (the difference between the fewest and the most laps). Show your work.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



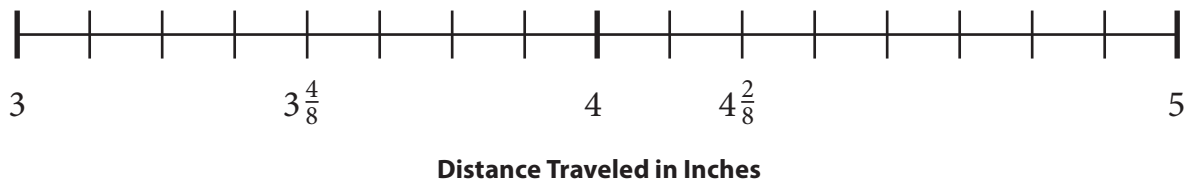
## Snail Race

Cindy had a collection of snails. She wanted to see which snail could travel the farthest in one minute. Below is a table showing the distance each snail traveled.

Snail	Distance Traveled
A	$4\frac{1}{4}$ inches
B	$4\frac{7}{8}$ inches
C	$3\frac{3}{4}$ inches
D	$4\frac{1}{4}$ inches
E	$4\frac{5}{8}$ inches
F	$4\frac{1}{2}$ inches
G	$4\frac{3}{8}$ inches

**1** Complete the line plot below to display the information shown in the chart and then answer the questions that follow. Be sure to finish labeling all of the marks along the line before you plot the data points.

Number of Snails



- 2** What is the shortest (*minimum*) distance?
- 3** What is the longest (*maximum*) distance?
- 4** What is the difference between the shortest and longest distance (*range*)? Show your work.
- 5** Which distance appears most often (*mode*)?
- 6** Which distance is the middle value of all the measurements (*median*)?

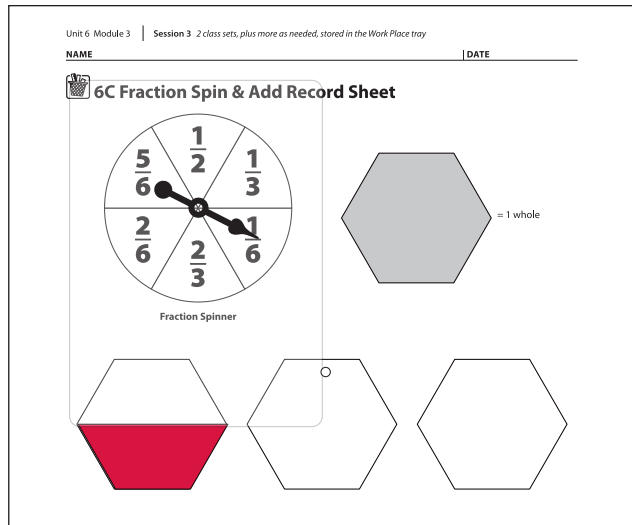


## Work Place Instructions 6C Fraction Spin & Add

### Each pair of players needs:

- 6C Fraction Spin & Add Record Sheets (1 for each player)
- pattern blocks
- 1 spinner overlay

- 1 Players determine who will be Player 1 and Player 2 and write their names on their record sheets.
- 2 Player 1 spins the spinner twice and adds the two spins (fractions) together.
- 3 Player 1 then finds pattern blocks to represent the sum of the fractions and places them on the first row of hexagons on his record sheet.
- 4 Player 2 takes a turn and repeats steps 3 and 4.
- 5 Whenever possible, players must “trade up” to have the fewest pattern blocks possible.



*Player 2 OK, first I landed on  $\frac{1}{3}$ , and then I landed on  $\frac{1}{6}$ . I know a blue rhombus is  $\frac{1}{3}$  of a hexagon, and a triangle is  $\frac{1}{6}$ . If you put those together, they make a trapezoid, which is half a hexagon.*

- 6 The first player to fill all six hexagons wins. If Player 1 wins, Player 2 gets one more turn to try to make it a tie game. Going over six hexagons is allowed.

### Game Variations

- A Students spin only one time and place pattern block pieces on the record sheet.
- B The game continues until one player fills up the six hexagons exactly without going over.
- C Players record their moves (spins and trades) by writing fraction addition equations.
- D Players start with six whole hexagons, spin, and subtract pieces until they are left with none. Players record subtraction equations.



## Playing Fraction Spin & Add

- 1** Melinda is playing Fraction Spin & Add. She spins  $\frac{1}{6}$  and  $\frac{2}{3}$ .
  - a** What is the sum of Melinda's spins?
  
  - b** What pattern blocks should she put on her record sheet so she uses the fewest pieces?
  
- 2** Now it's Kevin's turn. He spins  $\frac{2}{3}$  and  $\frac{5}{6}$ .
  - a** What is the sum of Kevin's spins?
  
  - b** What pattern blocks should he put on his record sheet so he uses the fewest pieces?
  
- 3** Ryan and Elizabeth are also playing Fraction Spin & Add. Ryan spins  $\frac{1}{2}$  and  $\frac{2}{3}$ . Elizabeth spins  $\frac{1}{3}$  and  $\frac{5}{6}$ . Who has the greater sum? How do you know?
  
- 4** Michael's sum for his spins is  $1\frac{1}{3}$ . Jana's sum is  $\frac{7}{6}$ . Who has the greater sum? How do you know?
  
- 5** Emily has filled  $5\frac{1}{3}$  of the hexagon shapes on her record sheet. What final spin would completely fill her sixth hexagon?





## Present Purchase page 1 of 2

- 1** Joanna and seven friends wanted to buy a hardcover book for their teacher from the latest book order. If the book cost \$12, how much would each of the 8 friends need to give in order to buy the present?
- 2** Another 8 students overheard Joanna's conversation and wanted to participate in the gift giving as well. If 16 students wanted to buy the hardcover book, how much would each need to give?
- 3** The 16 students decided they wanted to purchase the book's sequel, too, which cost another \$12. How much would each student need to give to buy \$24 in books?

*(continued on next page)*

**Present Purchase** page 2 of 2

- 4** After much discussion, the group decided that Joanna and her original 7 friends would purchase one book, and the other group would get a different gift. If Joanna's group purchased plain wrapping paper, it would cost \$1.60. How much additional money would the 8 friends each need to give to buy the wrapping paper?
- 5** One friend mentioned that she saw glitter wrapping paper for \$3.20. If the 8 friends chose this paper, how much would they each spend on it?
- 6** Joanna also wanted to get ribbons and bows to decorate the package. If the total cost for wrapping and decorating was \$6.40, how much would each of the 8 friends spend?



## Fraction Review

**1** Change the following fractions to mixed numbers.

**a**  $\frac{15}{4} =$

**b**  $\frac{13}{5} =$

**c**  $\frac{21}{4} =$

**d**  $\frac{27}{6} =$

**2** Change the following mixed numbers to fractions.

**a**  $3\frac{1}{4} =$

**b**  $6\frac{7}{8} =$

**c**  $5\frac{4}{5} =$

**d**  $2\frac{1}{6} =$

**3** Write an equivalent fraction for each of the following.

**a**  $\frac{2}{100} =$

**b**  $\frac{4}{5} =$

**c**  $\frac{3}{12} =$

**d**  $\frac{2}{8} =$

**4** Compare the following fractions. Fill in the blank with  $<$ ,  $>$ , or  $=$ .

**a**  $\frac{7}{6}$    $\frac{6}{7}$

**b**  $\frac{3}{12}$    $\frac{4}{16}$

**c**  $\frac{3}{4}$    $\frac{4}{5}$

**d**  $\frac{1}{2}$    $\frac{7}{16}$

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Splitting the Cost

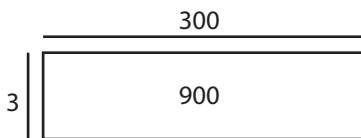
- 1** Ten students will split the cost of a \$4 book. Which of the equations does **not** represent the situation? ( $m$  stands for the amount of money each student will pay)

$\$4 \div 10 = m$      
   $10 \times m = \$4$      
   $\frac{4}{10} = \frac{2}{5} = 0.40$      
   $10 \div 4 = m$

- 2** Fill in the ratio table to find  $2,721 \div 3$ .

1		$2,721 \div 3 =$ <span style="background-color: #cccccc; display: inline-block; width: 40px; height: 15px; vertical-align: middle;"></span>
3	2,721	

- 3** Finish the array to find  $2,721 \div 3$ .



$2,721 \div 3 =$

- 4** What is the length of a rectangle that has an **area** of  $2,721 \text{ ft}^2$  and a width of 3 feet?

- 5 CHALLENGE** What is the length of a rectangle that has a **perimeter** of 2,721 feet and a width of 3 feet? Show your work.



# Work Place Instructions 6D Lowest Remainder Wins

## Each pair of players needs:

- 2 copies of the 6D Lowest Remainder Wins Record Sheets
- 1 die numbered 0–5
- 2 dice numbered 1–6
- 1 spinner overlay

- 1 Players decide who will go first. One player spins the spinner to get the first divisor for both players.
- 2 Players start a ratio table for the divisor in the Round 1 box on their record sheets. They fill in the ratio table for 10, 20, and 5.
- 3 Each player rolls either two dice (for a 2-digit dividend) or three dice (for a 3-digit dividend). Players may arrange the digits in any order to make a dividend. Players should try to make a number that won't leave a remainder when it is divided by the divisor. If that doesn't work, they try to make a number that will leave a very small remainder.
- 4 Each player records her division problem on her own record sheet and solves it. Players add any useful combinations to their ratio table to help.

Unit 6 Module 4 | Session 1 2 class sets, plus more as needed, stored in the Work Place tray

NAME Brianna

**6D Lowest Remainder Wins Record Sheet**

Divisor Spinner

Ratio Table for: 8

1	10	20	5	7
8	80	160	40	56

Round 1

Work Space

$$256 \div 8 = 32$$

$$25 \times 8 = 200$$

$$7 \times 8 = 56$$

256	
- 200	
56	
- 56	
0	

Unit 6 Module 4 | Session 1 2 class sets, plus more as needed, stored in the Work Place tray

NAME Maria Jose

DATE

**6D Lowest Remainder Wins Record Sheet**

Divisor Spinner

Ratio Table for: 8

1	10	20	5	3
8	80	160	40	24

Round 1

Work Space

$$65 \div 8 = 8r1$$

$$5 \times 8 = 40$$

$$3 \times 8 = 24$$

65	
- 40	
25	
- 24	
1	

- 5 When both players have solved their division problems, they explain their work to each other. When both players agree that each other's work is correct, they enter their scores on the scorecard at the bottom of their record sheets. Players get 0 points if they have no remainder. Otherwise, players get the number of points that matches their remainder. (For example, a remainder of 3 scores 3 points.)
- 6 After completing three rounds, players add the points to get their total scores. The player with the lower score wins.

## Game Variations

- A Players can use the challenge record sheets instead of the regular record sheets for this game. The challenge sheets have a spinner with higher divisors.
- B Players can use two dice marked 4–9 and one die marked 1–6.
- C Players can use four dice to try dividing some 4-digit numbers.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## David Goes Shopping

Solve each problem below. Choose the strategy that is easiest for you. Show your work.

- 1** David gave \$272 worth of books to the local library. Each book was worth \$8. How many books did he give to the library?

David gave \_\_\_\_\_ books to the library.

- 2** David spend \$216 on plants for his business. He bought 9 plants. If each plant cost the same amount, how much did one plant cost?

One plant cost \_\_\_\_\_.

- 3** David spent \$408 on DVDs over the past few years. Each DVD cost \$17. How many DVDs did he buy? (You do not have to use the ratio table, but it might help you solve the problem.)

Number of DVDs	1	
Cost	\$17	\$408

David bought \_\_\_\_\_ DVDs.



## School Carnival

Brightwood School is holding a carnival to earn money for new library books.

- 1** Jarrod and his 7 friends sold tickets at the front gate. They were supposed to keep track of how many tickets each person sold, but they forgot. They sold a total of 792 tickets. If each of the 8 children sold the same number of tickets, how many tickets did Jarrod sell?
- 2** During the carnival Madison and 8 of her friends collected tickets at the Jumpy Castle. They collected a total of 135 tickets. If each of the 9 children collected the same number of tickets, how many tickets did Madison collect?
- 3**  $594 \div 6$
- 4**  $120 \div 8$



## Remainder Review

- 1** Julia spilled ketchup on her paper and can't see a part of the problem anymore.

**5** Martha had \_\_\_\_\_ beads. She wanted to make 7 bracelets. How many will go on each bracelet?

$$\text{_____} \div 7 = 3 \text{ r } 2$$

- a** How many beads did Martha have? Fill in the blank: \_\_\_\_\_  $\div 7 = 3 \text{ r } 2$ .
- b** What does the remainder of 2 mean in this problem?
- 2** Each of the division problems below includes a remainder. Solve each and show your work. Figure out the best way to treat the remainder for each one: as a whole number, a fraction, or a decimal.
- a** Rachel earned \$46 dollars for walking dogs Monday through Friday last week. If she earned the same amount every day, how much did she earn per day?
- b** Bryson bought 27 balloons to share with three friends. How many balloons does each of the 4 children get?
- c** Ropes come in 16 foot lengths at the hardware store. Jorge bought one rope and then cut it into three equal size pieces. How long was each of the three pieces?
- 3** Abby did a story problem and got  $30 \div 4 = 7 \text{ R}2$  as the answer. Write a problem that could have been the one Abby solved.





## Tessa's Tickets

Tessa is performing in a production of *The Wizard of Oz*. She began selling tickets two weeks before the show's opening night. Show your work on each of the problems below.

**1** Adult tickets cost \$7.00.

- a** How much do 28 adult tickets cost?
  
  
  
  
  
  
  
  
  
  
- b** Tessa's neighbor spent \$105 on adult tickets. How many tickets did her neighbor buy?

**2** Children's tickets cost \$4.00.

- a** How much do 136 children's tickets cost?
  
  
  
  
  
  
  
  
  
  
- b** Tessa's aunt spent \$96 on children's tickets. How many tickets did her aunt buy?

**3** **CHALLENGE** Tessa's teacher spent \$44 on tickets. He bought some tickets for children and some for adults. How many children's tickets and how many adult tickets did Tessa's teacher buy?

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Multiplication Review

**1** Solve.

$3 \times 8 = \underline{\quad}$

$6 \times 10 = \underline{\quad}$

$12 \times \underline{\quad} = 60$

$\underline{\quad} = 8 \times 4$

$12 \times \underline{\quad} = 36$

$\underline{\quad} = 3 \times 4$

$4 \times 6 = \underline{\quad}$

$8 \times \underline{\quad} = 48$

$6 \times 3 = \underline{\quad}$

$12 \times 4 = \underline{\quad}$

$10 \times \underline{\quad} = 120$

$12 \times 40 = \underline{\quad}$

**2** Multiply. Show your work. You can use the problems you solved above to help.

$40 \times 36 = \underline{\quad}$

$43 \times 12 = \underline{\quad}$

**3** This table is about the cost of apples. Fill in the missing numbers in the table.

**4** **CHALLENGE** Use numbers, tables, sketches, or words to solve the problems below.

**a** How many pounds of apples can you get for \$70?

Pounds of Apples	Total Cost
1	\$1.75
2	
	\$5.25
5	
10	
	\$35.00

**b** How much do you have to pay for 15 pounds of apples?

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Fraction Mixer Card

My fraction:

Fractions less than my fraction:

Fractions equal to my fraction:

Fractions greater than my fraction:

**CHALLENGE** A fraction that makes 1 when I add it to mine:

What I learned or noticed today about comparing fractions:

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Shading & Comparing Fractions

- 1** Shade in a bar below to show each fraction. Write the fraction you shaded beside each bar.

$$\frac{9}{12}$$

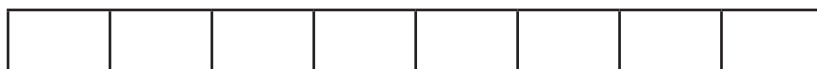
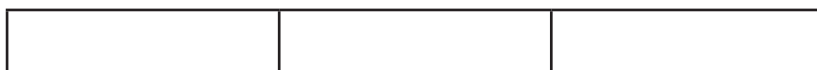
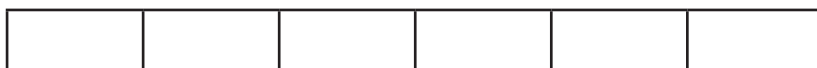
$$\frac{2}{3}$$

$$\frac{5}{6}$$

$$\frac{1}{4}$$

$$\frac{1}{2}$$

$$\frac{6}{8}$$



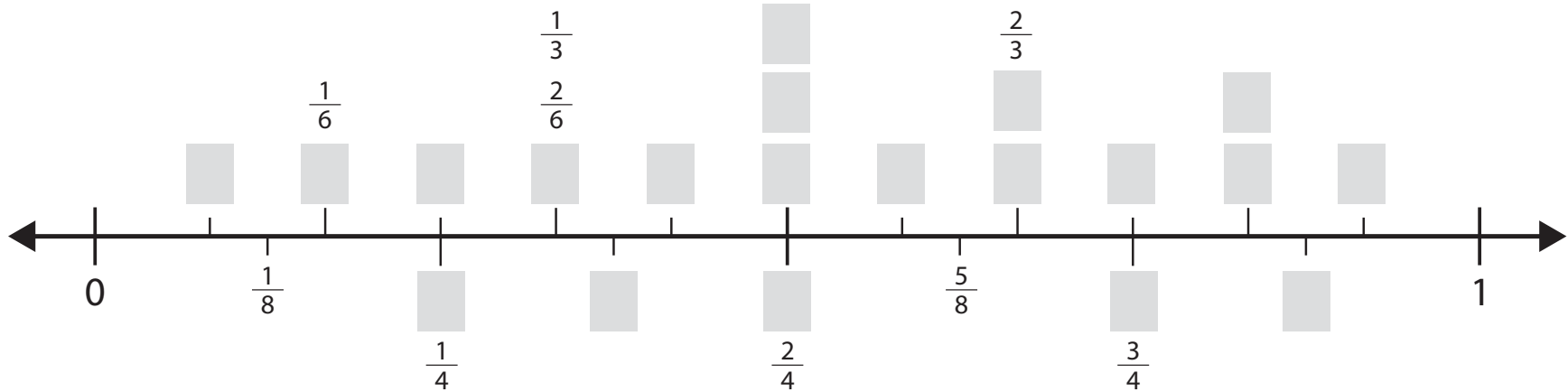
- 2** Which fraction above is the greatest, and which is the least? Write a comparison statement using  $<$  or  $>$  to show.
- 3** Which two fractions above are equivalent fractions? Explain how you know.

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## Lining Up Fractions

**1** Label each unlabeled mark on the number line below. You will be able to label some of them with more than one fraction.



**2** What fraction is equivalent to  $\frac{1}{4}$ ? \_\_\_\_\_

**3** Name three more pairs of equivalent fractions you see on the number line.

\_\_\_\_\_ = \_\_\_\_\_      \_\_\_\_\_ = \_\_\_\_\_      \_\_\_\_\_ = \_\_\_\_\_

**4 a** Which fraction is closer to 1:  $\frac{11}{12}$  or  $\frac{7}{8}$ ? \_\_\_\_\_

**b** Write an inequality statement to compare  $\frac{11}{12}$  and  $\frac{7}{8}$  using  $<$  or  $>$ . \_\_\_\_\_

**5 a** Which fraction is closer to  $\frac{1}{2}$ :  $\frac{5}{12}$  or  $\frac{3}{8}$ ? \_\_\_\_\_

**b** Write an inequality statement to compare  $\frac{5}{12}$  and  $\frac{3}{8}$  using  $<$  or  $>$ . \_\_\_\_\_

**6 a** Which is greater:  $\frac{1}{3}$  or  $\frac{3}{8}$ ? \_\_\_\_\_

**b** Explain how you know.

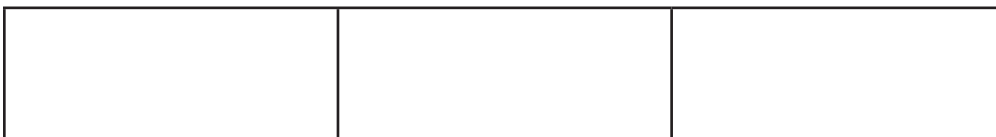
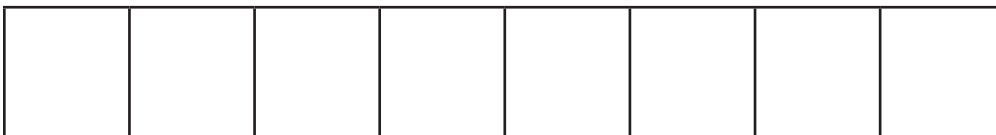
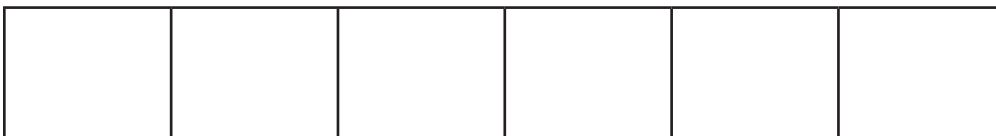
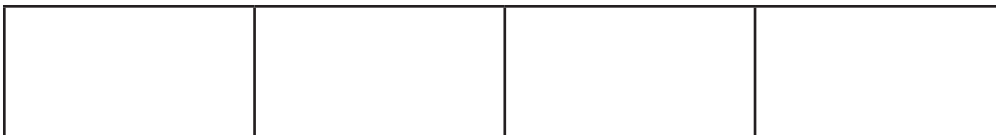


## Shading & Comparing Fractions Using Half

This bar shows  $\frac{1}{2}$ .



- Shade in some of each bar below to show four fractions. Make them so that no two of your fractions are equivalent to each other.
- Next to each bar, write the fraction that describes your work, then use  $<$ ,  $=$ , or  $>$  to show how the fraction you shaded compares to  $\frac{1}{2}$ .



- Write your five fractions in order from least to greatest.

\_\_\_\_\_

NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Equivalent Fraction Fill Record Sheet 1

--	--	--	--	--	--	--	--	--	--	--	--	--

	=	
--	---	--

--	--	--	--	--	--	--	--

	=	
--	---	--

--	--	--	--	--	--

	=	
--	---	--

--	--	--	--

	=	
--	---	--

--	--	--

	=	
--	---	--

NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Equivalent Fraction Fill Record Sheet 2

--	--	--	--	--	--	--	--	--	--	--	--

	=	
--	---	--

--	--	--	--	--	--	--	--

	=	
--	---	--

--	--	--	--	--	--

	=	
--	---	--

--	--	--	--

	=	
--	---	--

--	--	--

	=	
--	---	--





# Equivalent Fraction Fill Experimentation Sheet

--	--	--	--	--	--	--	--	--	--	--	--

$$\frac{\square}{12}$$

--	--	--	--	--	--	--	--	--	--	--	--

$$\frac{\square}{12}$$

--	--	--	--	--	--	--	--	--	--	--	--

$$\frac{\square}{12}$$

--	--	--	--	--	--	--	--	--	--	--	--

$$\frac{\square}{12}$$

--	--	--	--	--	--	--	--

$$\frac{\square}{8}$$

--	--	--	--	--	--	--	--

$$\frac{\square}{8}$$

--	--	--	--	--	--	--	--

$$\frac{\square}{8}$$

--	--	--	--	--	--	--	--

$$\frac{\square}{8}$$

--	--	--	--	--	--

$$\frac{\square}{6}$$

--	--	--	--	--	--

$$\frac{\square}{6}$$

--	--	--	--	--	--

$$\frac{\square}{6}$$

--	--	--	--	--	--

$$\frac{\square}{6}$$

--	--	--	--

$$\frac{\square}{4}$$

--	--	--	--

$$\frac{\square}{4}$$

--	--	--	--

$$\frac{\square}{4}$$

--	--	--	--

$$\frac{\square}{4}$$

--	--	--

$$\frac{\square}{3}$$

--	--	--

$$\frac{\square}{3}$$

--	--	--

$$\frac{\square}{3}$$

--	--	--

$$\frac{\square}{3}$$

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Comparing Fractions

- 1** Represent each fraction on a bar. Then complete each statement with  $<$ ,  $>$ , or  $=$  to compare the fractions.

**a**

--	--	--	--	--	--

--	--	--

$$\frac{5}{6} \text{ ————— } \frac{2}{3}$$

**b**

--	--	--

--	--	--	--	--	--	--	--

$$\frac{2}{3} \text{ ————— } \frac{3}{8}$$

**c**

--	--	--	--

--	--	--	--	--	--

$$\frac{4}{6} \text{ ————— } \frac{3}{4}$$

- 2 a** Find two fractions above that are equivalent. Write them here.

\_\_\_\_\_ = \_\_\_\_\_

- b** Explain how you know the fractions are equivalent.

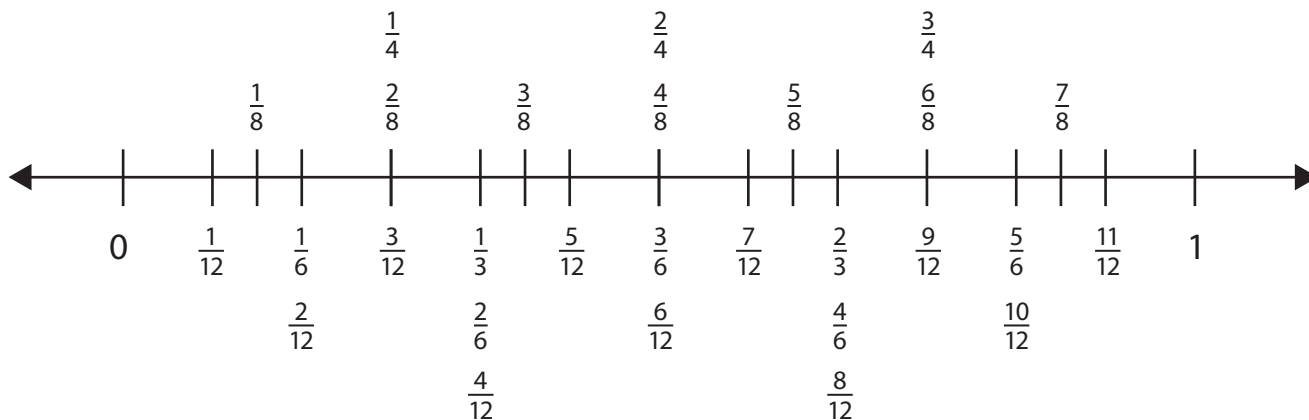
NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Comparing Fractions with a Number Line

Use this number line to help you solve the problems and answer the questions below.



- 1** Use what you know about how each fraction compares to 1 to complete these comparisons with  $<$ ,  $=$ , or  $>$ .

$\frac{5}{6}$    $\frac{11}{12}$      
  $\frac{5}{6}$    $\frac{7}{8}$      
  $\frac{11}{12}$    $\frac{7}{8}$      
  $\frac{7}{8}$    $\frac{2}{3}$      
  $\frac{3}{4}$    $\frac{5}{6}$

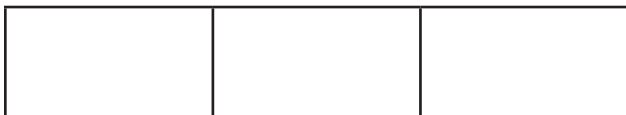
- 2** Use what you know about how far each fraction is from 0 to complete these comparisons with  $<$ ,  $=$ , or  $>$ .

$\frac{1}{6}$    $\frac{1}{12}$      
  $\frac{1}{6}$    $\frac{3}{8}$      
  $\frac{1}{12}$    $\frac{3}{8}$      
  $\frac{3}{8}$    $\frac{1}{3}$      
  $\frac{1}{4}$    $\frac{1}{6}$

- 3** On this bar, shade in  $\frac{4}{6}$ .

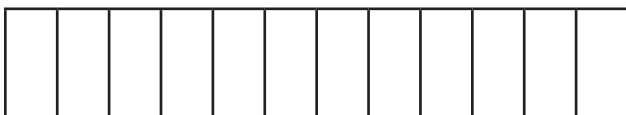


- 4** Use this bar to show how many thirds are equal to  $\frac{4}{6}$ . Then write an equation to show.



$$\frac{\square}{\square} = \frac{\square}{\square}$$

- 5** Use this bar to show how many twelfths are equal to  $\frac{4}{6}$ . Then write an equation to show.



$$\frac{\square}{\square} = \frac{\square}{\square}$$

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Shade & Describe Equivalent Fractions

- 1** Use the bars below to draw and shade two fractions that are equivalent to  $\frac{2}{3}$ . For each new fraction, write an expression to show how you multiplied both the numerator and the denominator to make the new fraction.



$$\frac{2}{3} \times \frac{1}{1} = \frac{2}{3}$$



$$\frac{2}{3} \times \frac{\square}{\square} = \frac{\square}{\square}$$

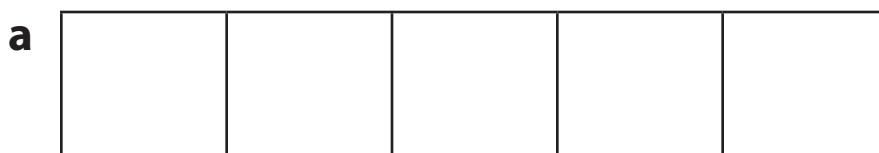


$$\frac{2}{3} \times \frac{\square}{\square} = \frac{\square}{\square}$$

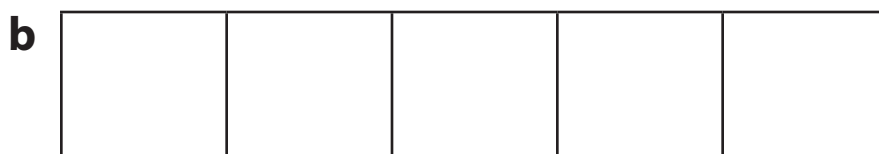
- 2** Use the bars below to draw and shade two fractions that are equivalent to  $\frac{3}{5}$ . For each new fraction, write an expression to show how you multiplied both the numerator and the denominator to make the new fraction.



$$\frac{3}{5} \times \frac{1}{1} = \frac{3}{5}$$



$$\frac{3}{5} \times \frac{\square}{\square} = \frac{\square}{\square}$$



$$\frac{3}{5} \times \frac{\square}{\square} = \frac{\square}{\square}$$

- 3** Which fraction is greater:  $\frac{2}{3}$  or  $\frac{3}{5}$ ? How do you know?



## Comparing Fractions in Context page 1 of 2

- 1** Brianna and her brother Corey love the kind of bubble gum that looks like a long roll of tape. The whole roll is way too much gum to chew at once, so their grandma cut two pieces that were exactly the same length and gave one to Brianna and one to Corey. Brianna cut her gum tape into 3 equal pieces and chewed 2 of them. Corey cut his gum tape into 5 equal pieces and chewed 3 of them. Who chewed more gum?



- a** Brianna chewed \_\_\_\_\_ of a strip. Corey chewed \_\_\_\_\_ of a strip.
- b** \_\_\_\_\_ chewed more than \_\_\_\_\_.

We know because \_\_\_\_\_

- 2** Their cousins Malik and Caitlin came over, so, to be fair, their grandma gave each of them a piece of gum tape that was exactly the same length. Malik chewed  $\frac{3}{4}$  of his and Caitlin chewed  $\frac{7}{10}$  of hers. Who chewed more: Malik or Caitlin?

- a** \_\_\_\_\_ chewed more than \_\_\_\_\_.

We know because \_\_\_\_\_

**Comparing Fractions in Context** page 2 of 2

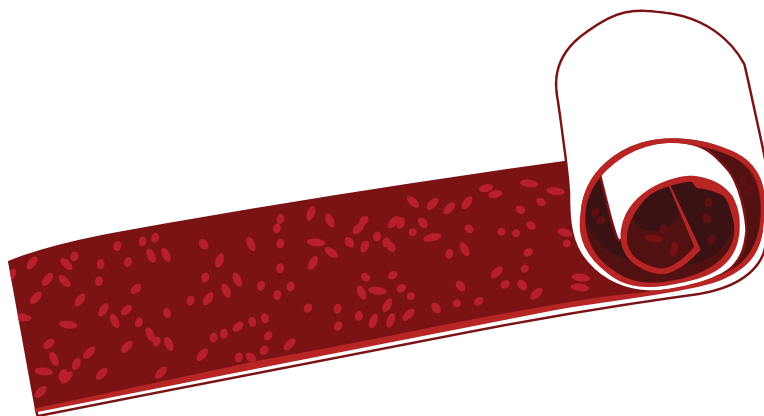
**3** Later that day, Brianna and Corey left their grandma's house and went home. Their dad gave them some fruit leather in long strips as a snack. Brianna and Corey each got their own strip, and the strips were exactly the same length. Brianna cut her strip into 5 equal pieces and ate 3 of them. Corey cut his strip into 8 equal pieces and ate 5 of them. Who ate a greater amount of fruit leather, Brianna or Corey?

**a** Brianna ate \_\_\_\_\_ of a fruit leather strip.

Corey ate \_\_\_\_\_ of a fruit leather strip.

**b** \_\_\_\_\_ ate more than \_\_\_\_\_.

We know because \_\_\_\_\_





## Comparing Fractions with Different Denominators

**1** Rewrite each fraction with the denominator 24.

**ex**  $\frac{1}{2} \times \frac{12}{12} = \frac{12}{24}$

**a**  $\frac{1}{3}$

**b**  $\frac{2}{3}$

**c**  $\frac{1}{4}$

**d**  $\frac{3}{4}$

**e**  $\frac{1}{6}$

**f**  $\frac{5}{6}$

**g**  $\frac{3}{8}$

**h**  $\frac{5}{8}$

**i**  $\frac{5}{12}$

**j**  $\frac{7}{12}$

**2** Rewrite each pair of fractions with a common denominator.  
Then write an inequality to compare them.

**ex**  $\frac{1}{3} \quad \frac{5}{12}$

$$\frac{8}{24} \quad \frac{10}{24}$$

$$\frac{1}{3} < \frac{5}{12}$$

**a**  $\frac{2}{3} \quad \frac{5}{8}$

**b**  $\frac{5}{12} \quad \frac{3}{4}$

**c**  $\frac{3}{8} \quad \frac{1}{3}$

**d**  $\frac{1}{3} \quad \frac{2}{5}$

**e**  $\frac{7}{12} \quad \frac{6}{8}$

**f**  $\frac{5}{8} \quad \frac{7}{10}$

**g**  $\frac{5}{6} \quad \frac{7}{8}$

### CHALLENGE

**h**  $\frac{2}{3} \quad \frac{5}{7}$

**i**  $\frac{7}{9} \quad \frac{2}{3}$

**j**  $\frac{2}{5} \quad \frac{3}{7}$

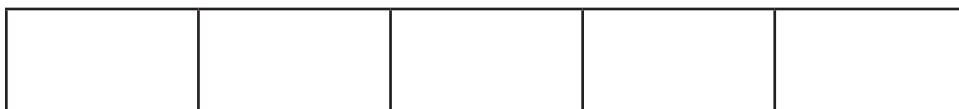
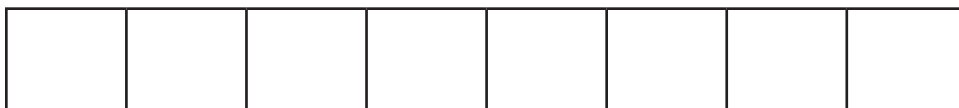


## Comparing Fractions at the Wild Animal Park

Jazmin and Brent visited a wild animal park. In most of the park, you look at the animals from a distance that is safe for both people and animals, but in one part of the park it's OK to get close and feed some animals. You can buy seed bars to give to the prairie dogs, and little bricks of hay to feed to the deer.

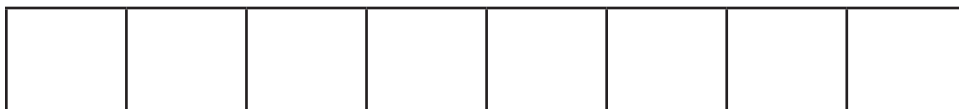
Solve the problems below. You can use the fraction bars to help.

- 1** Brent and Jazmin each bought a seed bar to feed the prairie dogs. When they were done walking through the animal feeding area, Brent had  $\frac{3}{8}$  of his seed bar left. Jazmin had  $\frac{2}{5}$  of her seed bar left. Who had more of a seed bar left over?



\_\_\_\_\_ had more seed bar left over.

- 2 a** Brent and Jazmin each bought a little brick of hay to feed to the deer. Brent fed  $\frac{5}{6}$  of his hay to the deer. Jazmin fed  $\frac{6}{8}$  of her hay to the deer. Who fed more hay to the deer?



\_\_\_\_\_ fed more hay to the deer.

- b CHALLENGE** Who had more hay left over, and how much did they have left?

\_\_\_\_\_ had 

--

 of a brick of hay left over.



NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Shade & Describe More Equivalent Fractions

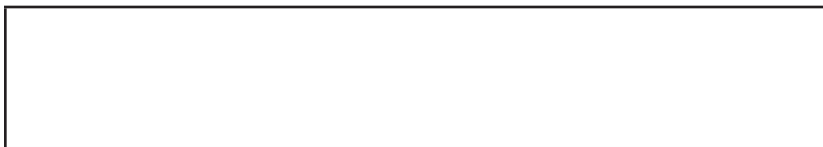
- 1 a** Use the bars to show and name two fractions that are equivalent to  $\frac{8}{12}$ .  
The denominators for two fractions you can make are filled in for you.



$$\frac{8}{12}$$



$$\frac{\square}{6}$$



$$\frac{\square}{3}$$

- b** How many **sixths** are equal to  $\frac{4}{12}$ ?  
Write an equation to show.

$$\frac{\square}{6} = \frac{\square}{6}$$

- c** How many **thirds** are equal to  $\frac{2}{6}$ ?  
Write an equation to show.

$$\frac{\square}{3} = \frac{\square}{3}$$

- 2 a** Shade in this bar to show  $\frac{2}{5}$ .



$$\frac{2}{5}$$

- b** Use this bar to show and name a fraction that is equivalent to  $\frac{2}{5}$ .  
The bar has been divided into fifths for you. Draw more lines to make your equivalent fraction.



$$\frac{\square}{\square}$$

- 3** Which fraction is greater:  $\frac{8}{12}$  or  $\frac{2}{5}$ ? How do you know?

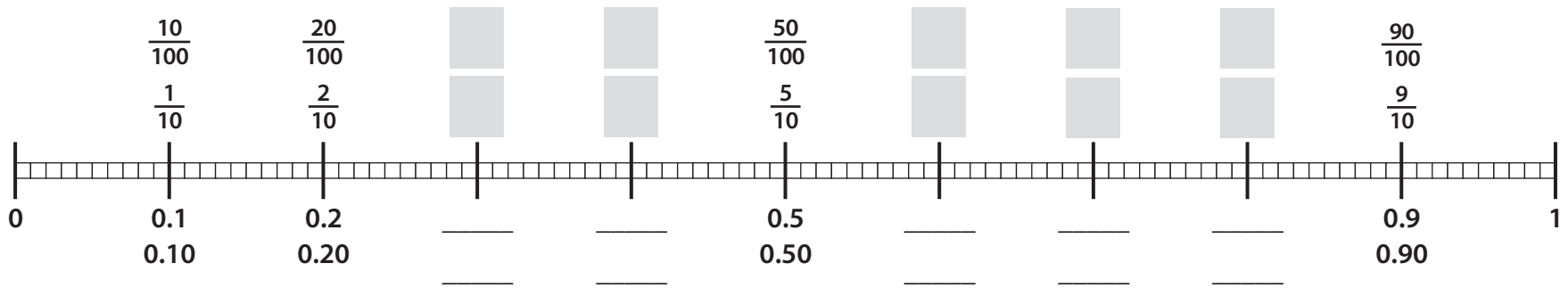
NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Decimal Fractions & Numbers

**1** Fill in the missing decimals and fractions on the number line.



**2** When numbers share a place on the number line, that means they are equivalent. For each number, circle the other numbers that are equivalent.

**a** 0.7

7    0.70    70     $\frac{7}{10}$      $\frac{70}{100}$     0.07     $\frac{7}{100}$

**b**  $\frac{9}{10}$

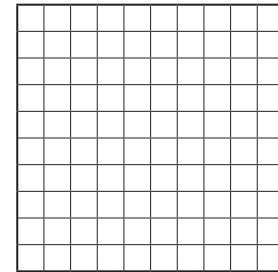
0.09     $\frac{9}{100}$     0.9    0.90     $\frac{90}{100}$     9    90

**c**  $\frac{40}{100}$

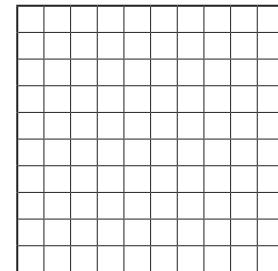
0.4     $\frac{4}{100}$     40    4     $\frac{4}{10}$     0.04    0.40

**3** Shade in the grid to show each number. Write two decimal numbers to represent each value.

**a** eight tenths

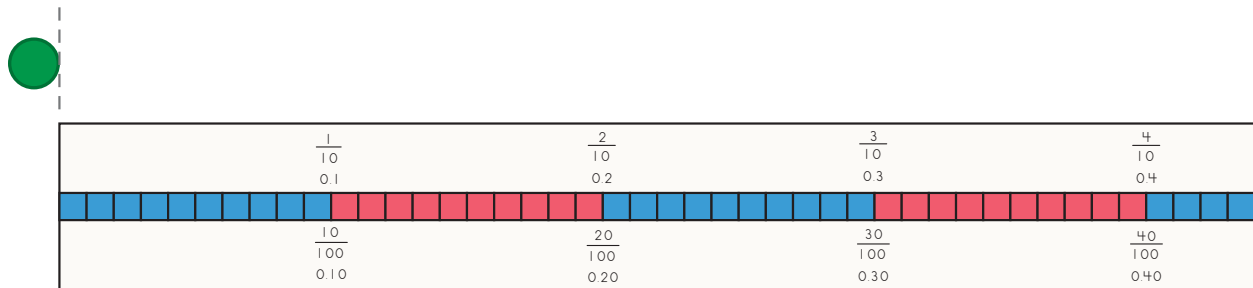


**b** three tenths

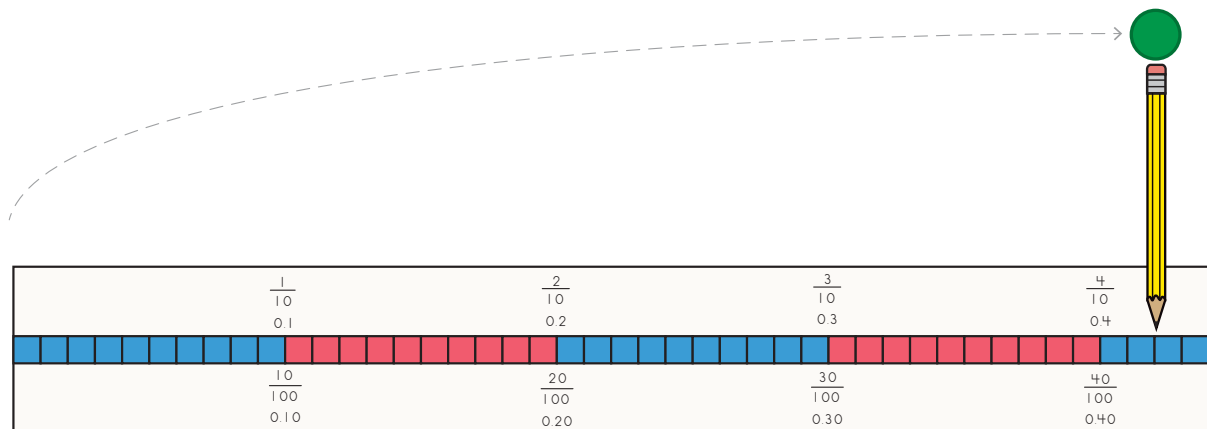


## Scoot the Marker Instructions

- Fasten your decimal strip to a table, the floor, or another smooth and flat surface.
- Set your game marker to one side of your decimal strip, as shown.



- Flick your marker, and read the distance it traveled.
  - If the marker lands too far away from the decimal strip to read the distance accurately, use your pencil to help.



- Record the distance on the record sheet in fractions (for fractions game) or decimals (for numbers game), as shown below.
- Repeat until you and your partner have each taken 5 turns.
- Write an inequality statement on your record sheet to show which range each distance falls into, as shown below.
- Figure out how many points you got for each turn. Add them to find your total score.

Scoring Guide	1 point	3 points	2 points	0 points
Fractions game	less than $\frac{4}{10}$	$\frac{4}{10}$ to $\frac{6}{10}$	$\frac{61}{100}$ to $\frac{9}{10}$	greater than $\frac{9}{10}$
Numbers game	less than 0.4	0.4 to 0.6	0.61 to 0.9	greater than 0.9

Turn	Distance in Meters	Inequality Statement	Points
Fractions game	$\frac{42}{100}$ m	$\frac{4}{10} < \frac{42}{100} < \frac{6}{10}$	3
Numbers game	0.42 m	0.4 < 0.42 < 0.6	2

NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Scoot the Marker Record Sheet Decimal Fractions Game

See game instructions on page 269.

Scoring Guide			
1 point	3 points	2 points	0 points
$< \frac{4}{10}$	$\frac{4}{10}$ to $\frac{6}{10}$	$\frac{61}{100}$ to $\frac{9}{10}$	$> \frac{4}{10}$

## Game 1

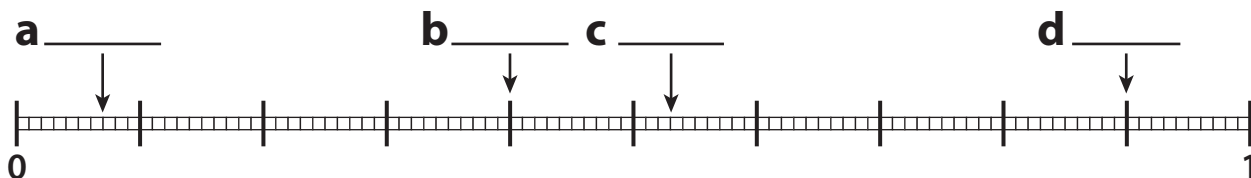
Turn	Distance in Meters	Inequality Statement	Points
<b>a</b>			
<b>b</b>			
<b>c</b>			
<b>d</b>			
<b>e</b>			
<b>Total Score</b>			

## Game 2

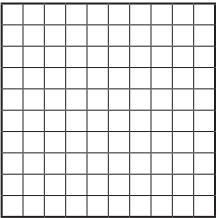
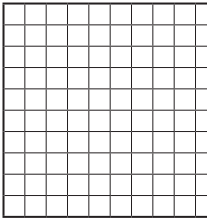
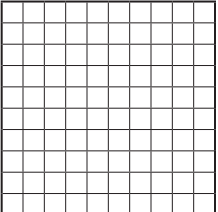
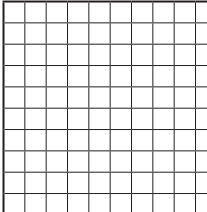
Turn	Distance in Meters	Inequality Statement	Points
<b>a</b>			
<b>b</b>			
<b>c</b>			
<b>d</b>			
<b>e</b>			
<b>Total Score</b>			

# Decimal Fractions on Line & Grid

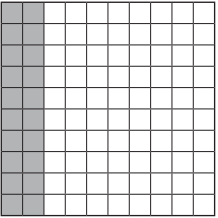
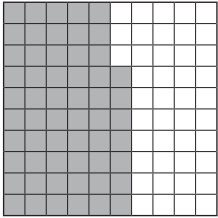
**1** Label each marked point on the decimal strip with a fraction. Use tenths when you can, and hundredths when you must.



**2** Write each number you labeled on the number line above here. Then shade in the grid to show each value and write a fraction to represent it.

<p><b>a</b></p> <p>_____</p> <p style="text-align: center;">fraction</p> <p>_____</p> <p style="text-align: center;">decimal</p> 	<p><b>b</b></p> <p>_____</p> <p style="text-align: center;">fraction</p> <p>_____</p> <p style="text-align: center;">decimal</p> 
<p><b>c</b></p> <p>_____</p> <p style="text-align: center;">fraction</p> <p>_____</p> <p style="text-align: center;">decimal</p> 	<p><b>d</b></p> <p>_____</p> <p style="text-align: center;">fraction</p> <p>_____</p> <p style="text-align: center;">decimal</p> 

**3** Write fractions and decimals to show how much of each grid is shaded.

<p><b>a</b></p>  <p>_____</p> <p style="text-align: center;">fraction</p> <p>_____</p> <p style="text-align: center;">fraction</p> <p>_____</p> <p style="text-align: center;">decimal</p> <p>_____</p> <p style="text-align: center;">decimal</p>	<p><b>b</b></p>  <p>_____</p> <p style="text-align: center;">fraction</p> <p>_____</p> <p style="text-align: center;">fraction</p> <p>_____</p> <p style="text-align: center;">decimal</p> <p>_____</p> <p style="text-align: center;">decimal</p>
---	---

**4** Why can you write two different decimal fractions and decimal numbers for grid **a**, and only one for each for grid **b** in problem 3 above?

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Scoot the Marker Record Sheet** Decimal Numbers Game

See game instructions on page 269.

Scoring Guide			
1 point	3 points	2 points	0 points
< 0.4	0.4 to 0.6	0.61 to 0.9	> 0.9

**Game 1**

Turn	Distance in Meters	Inequality Statement	Points
<b>a</b>			
<b>b</b>			
<b>c</b>			
<b>d</b>			
<b>e</b>			
<b>Total Score</b>			

**Game 2**

Turn	Distance in Meters	Inequality Statement	Points
<b>a</b>			
<b>b</b>			
<b>c</b>			
<b>d</b>			
<b>e</b>			
<b>Total Score</b>			

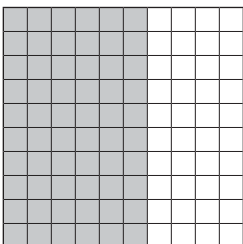
NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Writing & Comparing Decimal Numbers

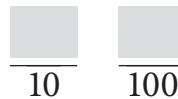
**1** Use the grid below to answer the questions.



**a** How many tenths are filled in? \_\_\_\_\_

**b** How many hundredths are filled in? \_\_\_\_\_

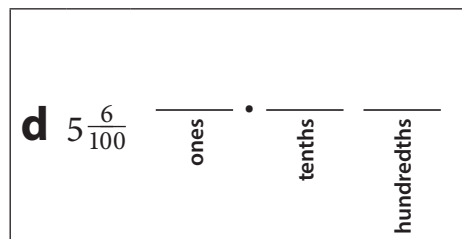
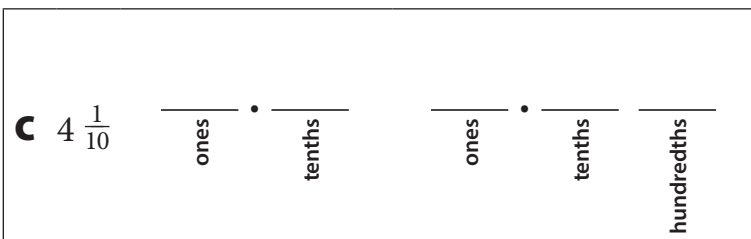
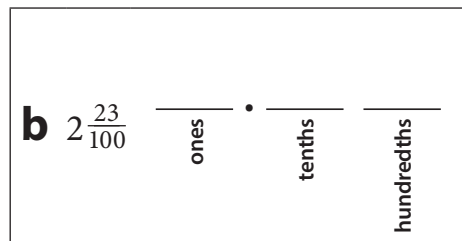
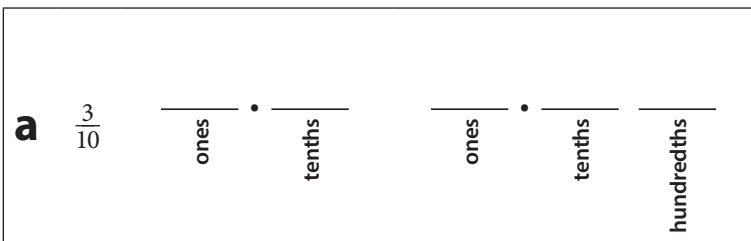
**c** Fill in the blanks to write two fractions that represent this amount.



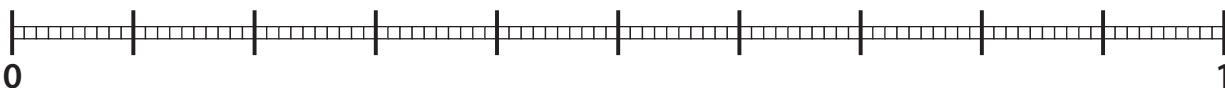
**d** Fill in the blanks to show two decimal numbers that represent this amount.



**2** Fill in the blanks to show one or two decimal numbers that represent each fraction or mixed number.



**3 a** Locate each decimal number on the number line.      0.06      0.6



**b** Complete the two inequalities to compare the two decimal numbers above.

\_\_\_\_\_ > \_\_\_\_\_      \_\_\_\_\_ < \_\_\_\_\_

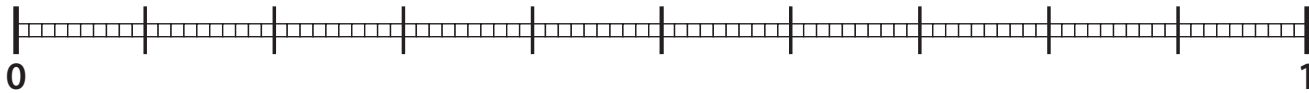
NAME \_\_\_\_\_

DATE \_\_\_\_\_

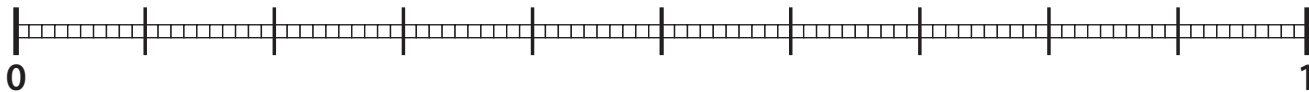


## Adding Decimal Fractions

**1**  $\frac{\square}{10} + \frac{\square}{10} = \square$  Will the sum be...  
 less than  $\frac{1}{2}$      equal to  $\frac{1}{2}$      greater than  $\frac{1}{2}$

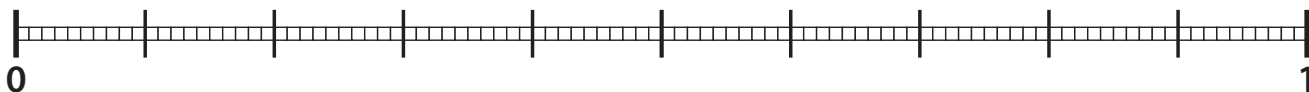


**2**  $\frac{\square}{100} + \frac{\square}{100} = \square$  Will the sum be...  
 less than  $\frac{1}{2}$      equal to  $\frac{1}{2}$      greater than  $\frac{1}{2}$



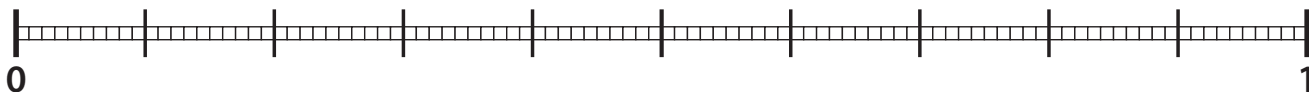
**3**  $\frac{\square}{10} + \frac{\square}{100}$  Will the sum be...  
 less than  $\frac{1}{2}$      equal to  $\frac{1}{2}$      greater than  $\frac{1}{2}$

$$\frac{\square}{10} + \frac{\square}{100} = \frac{\square}{100} + \frac{\square}{100} = \square$$



**4**  $\frac{\square}{100} + \frac{\square}{10}$  Will the sum be...  
 less than  $\frac{1}{2}$      equal to  $\frac{1}{2}$      greater than  $\frac{1}{2}$

$$\frac{\square}{100} + \frac{\square}{10} = \frac{\square}{100} + \frac{\square}{100} = \square$$







# Snail & Caterpillar Race to $\frac{300}{100}$ Instructions

## Each pair of players needs:

- a Snail & Caterpillar Race to  $\frac{300}{100}$  Record Sheet for each player
- 3 dice, one each numbered 0–5, 1–6, and 4–9
- 4 colored pencils of different colors (each player will use 2 colors)

- 1 Players roll the 4–9 die to see who will be Player 1. Player 1 gets to choose whether to play for the snail or the caterpillar. Players each circle the creature they’re playing for.
- 2 Players take turns rolling and recording fractions. On each turn, the player:
  - Rolls all 3 dice, then chooses one of the numbers rolled to take in tenths and fills that number in on the record sheet.
  - Decides how to arrange the other two numbers rolled to make a double-digit number to take in hundredths, and records that number on the record sheet.

Round 1

My fractions:  $\frac{4}{10} + \frac{58}{100} = \frac{100}{100} = \square$

- Shades in the tenths on the decimal strip using one color.
- Shades in the hundredths on the decimal strip using another color.
- Rewrites the tenths as hundredths, then adds the two fractions and records the sum.

Round 1

My fractions:  $\frac{4}{10} + \frac{58}{100} = \frac{40}{100} + \frac{58}{100} = \frac{98}{100}$

- 3 Players play 3 rounds, each player rolling the dice and recording fractions once per round. Players record their partner’s turns on the other decimal strip, but do not record their fractions. For example, if you are playing for the snail, record your partner’s turn on the caterpillar’s strip on your record sheet.
- 4 At the end of the game, each player finds their total by recording and adding their three scores at the bottom of the record sheet. Then players compare their totals to  $\frac{300}{100}$  and record the comparisons. The player with the total closest to, but not greater than,  $\frac{300}{100}$  wins.

My Total  $\frac{98}{100} + \frac{54}{100} + \frac{122}{100} = \frac{274}{100}$

Compare your total to  $\frac{300}{100}$ . Do the same for your partner’s total. Circle the total that is closest to, but not greater than,  $\frac{300}{100}$ .

My Total  $\frac{274}{100} < \frac{300}{100}$

My Partner’s Total  $\frac{268}{100} < \frac{300}{100}$

Consider strategies for winning. If you roll large numbers in the first round, what will you try to do next round? What would be the best amount to have in all 3 rounds to make your total come closest to  $\frac{300}{100}$ ?

NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Snail & Caterpillar Race to $\frac{300}{100}$ Record Sheet 1

I am racing for the  Snail  Caterpillar

<b>Round 1</b>	 	<p>My fractions: <math>\frac{\square}{10} + \frac{\square}{100} = \frac{\square}{100} + \frac{\square}{100} = \square</math></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> </div> <div style="width: 4%; text-align: center;">1</div> <div style="width: 48%;"> </div> <div style="width: 4%; text-align: center;">1</div> </div>
<b>Round 2</b>	 	<p>My fractions: <math>\frac{\square}{10} + \frac{\square}{100} = \frac{\square}{100} + \frac{\square}{100} = \square</math></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> </div> <div style="width: 4%; text-align: center;">1</div> <div style="width: 48%;"> </div> <div style="width: 4%; text-align: center;">1</div> </div>
<b>Round 3</b>	 	<p>My fractions: <math>\frac{\square}{10} + \frac{\square}{100} = \frac{\square}{100} + \frac{\square}{100} = \square</math></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> </div> <div style="width: 4%; text-align: center;">1</div> <div style="width: 48%;"> </div> <div style="width: 4%; text-align: center;">1</div> </div>

My Total  $\frac{\square}{100} + \frac{\square}{100} + \frac{\square}{100} = \square$

Compare your total to  $\frac{300}{100}$ . Do the same for your partner's total. Circle the total that is closest to, but not greater than,  $\frac{300}{100}$ .

My Total

$\frac{\square}{100}$

○

$\frac{300}{100}$

My Partner's Total

$\frac{\square}{100}$

○

$\frac{300}{100}$


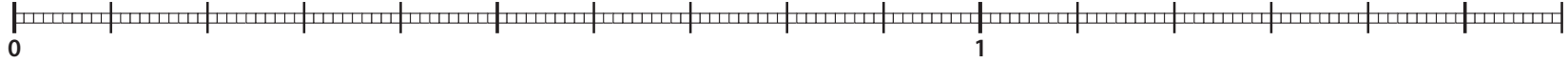

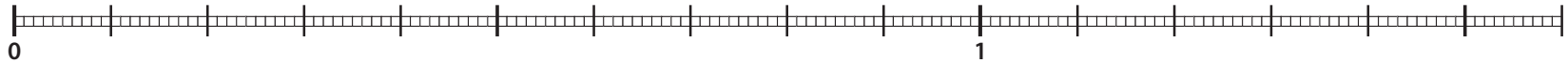



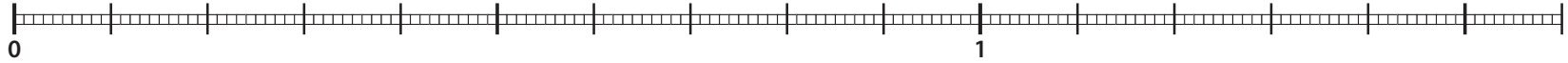

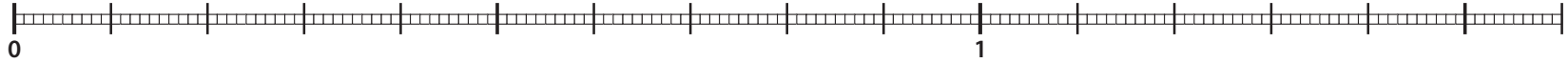

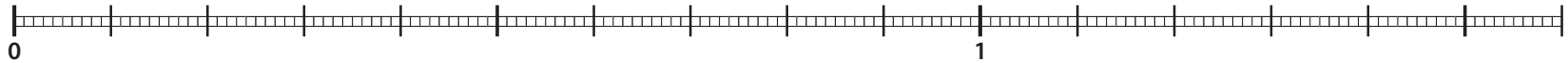
NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Snail & Caterpillar Race to $\frac{300}{100}$ Record Sheet 2

I am racing for the  Snail  Caterpillar

<b>Round 1</b>	<p>My fractions: <math>\frac{\square}{10} + \frac{\square}{100} = \frac{\square}{100} + \frac{\square}{100} = \square</math></p>  
	 
<b>Round 2</b>	<p>My fractions: <math>\frac{\square}{10} + \frac{\square}{100} = \frac{\square}{100} + \frac{\square}{100} = \square</math></p>  
	 
<b>Round 3</b>	<p>My fractions: <math>\frac{\square}{10} + \frac{\square}{100} = \frac{\square}{100} + \frac{\square}{100} = \square</math></p>  
	 

My Total  $\frac{\square}{100} + \frac{\square}{100} + \frac{\square}{100} = \square$

Compare your total to  $\frac{300}{100}$ . Do the same for your partner's total. Circle the total that is closest to, but not greater than,  $\frac{300}{100}$ .

My Total  $\frac{\square}{100}$  ○  $\frac{300}{100}$

My Partner's Total  $\frac{\square}{100}$  ○  $\frac{300}{100}$

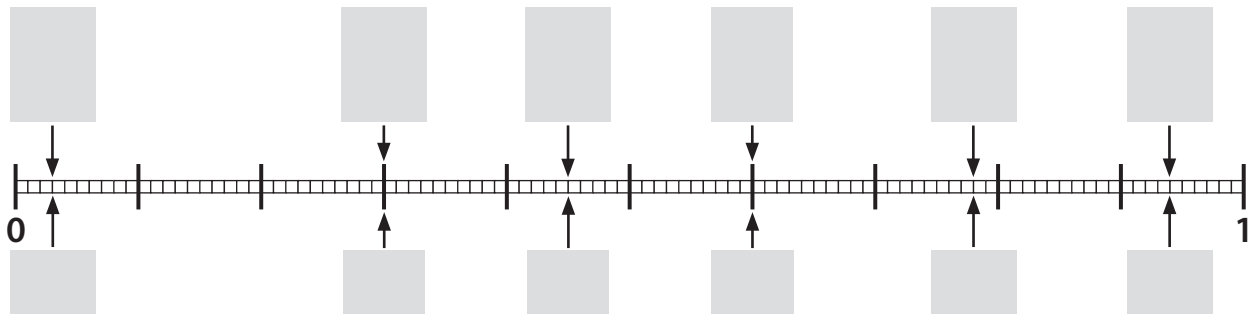
NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Decimal Review

- 1 Label each point on the number line, using decimals below the line and fractions above it.



- 2 Find each sum. Show your work.

$$\frac{34}{100} + \frac{4}{10} =$$

$$\frac{3}{10} + \frac{6}{100} =$$

$$\frac{7}{10} + \frac{13}{100} =$$

- 3 Write each sum above as a decimal number.

**a** \_\_\_\_\_

**b** \_\_\_\_\_

**c** \_\_\_\_\_

- 4 Write an inequality to compare numbers **a** and **c** above.

\_\_\_\_\_

- 5 For each number, circle all the other numbers that are equivalent.

<b>a</b> 0.7	70	$\frac{7}{10}$	$\frac{7}{100}$	0.07	7	$\frac{70}{100}$	0.70	700
<b>b</b> 0.04	40	400	$\frac{4}{10}$	$\frac{4}{100}$	0.4	$\frac{40}{100}$	0.40	4
<b>c</b> 0.36	$\frac{36}{10}$	$\frac{36}{100}$	36	3600	10	$\frac{3}{6}$	$\frac{6}{3}$	0.3

NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Multiplication Story Problems Record Sheet

**1** Use sketches and numbers to solve each of these story problems with your class.

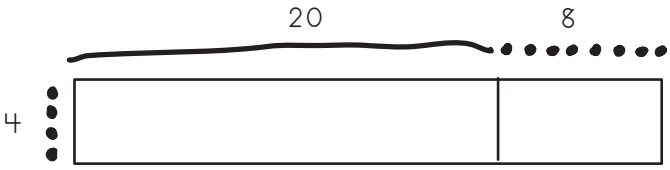
**a****b****c**

NAME \_\_\_\_\_

DATE \_\_\_\_\_

# Single-Digit Multiplication

**1** Use a sketch and numbers to solve the problems below. Follow the example.

Sketch	Numbers
	$  \begin{array}{r}  28 \\  4 \times 20 = \quad \times 4 \\  \quad \quad \quad \underline{80} \\  4 \times 8 = \quad \quad \times 8 \\  \quad \quad \quad \underline{32} \\  \quad \quad \quad \underline{112}  \end{array}  $
	$  \begin{array}{r}  36 \\  5 \times 30 = \quad \times 5 \\  \quad \quad \quad \square \\  5 \times 6 = \quad \quad \times 6 \\  \quad \quad \quad \underline{\square} \\  \quad \quad \quad \square  \end{array}  $
	$  \begin{array}{r}  24 \\  7 \times 20 = \quad \times 7 \\  \quad \quad \quad \square \\  7 \times 4 = \quad \quad \times 4 \\  \quad \quad \quad \underline{\square} \\  \quad \quad \quad \square  \end{array}  $
	$  \begin{array}{r}  45 \\  9 \times 40 = \quad \times 9 \\  \quad \quad \quad \square \\  9 \times 5 = \quad \quad \times 5 \\  \quad \quad \quad \underline{\square} \\  \quad \quad \quad \square  \end{array}  $

**2** Use numbers to solve these problems.

$  \begin{array}{r}  52 \\  6 \times 50 = \quad \times 6 \\  \quad \quad \quad \square \\  6 \times 2 = \quad \quad \times 2 \\  \quad \quad \quad \underline{\square} \\  \quad \quad \quad \square  \end{array}  $	$  \begin{array}{r}  37 \\  7 \times 30 = \quad \times 7 \\  \quad \quad \quad \square \\  7 \times 7 = \quad \quad \times 7 \\  \quad \quad \quad \underline{\square} \\  \quad \quad \quad \square  \end{array}  $	$  \begin{array}{r}  65 \\  \times 4 \\  \hline  \end{array}  $	$  \begin{array}{r}  325 \\  \times 7 \\  \hline  \end{array}  $
--	--	---	--

NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Double-Digit by Single-Digit Multiplication

1 Use a sketch and numbers to solve the problems below. Follow the example.

Sketch	Numbers
	$\begin{array}{r} 24 \\ \times 7 \\ \hline 7 \times 20 = \underline{140} \\ 7 \times 4 = \underline{28} \\ \hline 168 \end{array}$
	$\begin{array}{r} 27 \\ \times 5 \\ \hline 5 \times 20 = \underline{\phantom{000}} \\ 5 \times 7 = \underline{\phantom{00}} \\ \hline \phantom{000} \end{array}$
	$\begin{array}{r} 23 \\ \times 9 \\ \hline 9 \times 20 = \underline{\phantom{000}} \\ 9 \times 3 = \underline{\phantom{00}} \\ \hline \phantom{000} \end{array}$
	$\begin{array}{r} 35 \\ \times 8 \\ \hline 8 \times 30 = \underline{\phantom{000}} \\ 8 \times 5 = \underline{\phantom{00}} \\ \hline \phantom{000} \end{array}$

2 Use numbers to solve these problems.

$\begin{array}{r} 43 \\ \times 6 \\ \hline 6 \times 40 = \underline{\phantom{000}} \\ 6 \times 3 = \underline{\phantom{00}} \\ \hline \phantom{000} \end{array}$	$\begin{array}{r} 68 \\ \times 6 \\ \hline 6 \times 60 = \underline{\phantom{000}} \\ 6 \times 8 = \underline{\phantom{00}} \\ \hline \phantom{000} \end{array}$	$\begin{array}{r} 54 \\ \times 5 \\ \hline \phantom{000} \end{array}$	$\begin{array}{r} 83 \\ \times 4 \\ \hline \phantom{000} \end{array}$
--	--	---	---





NAME \_\_\_\_\_

DATE \_\_\_\_\_

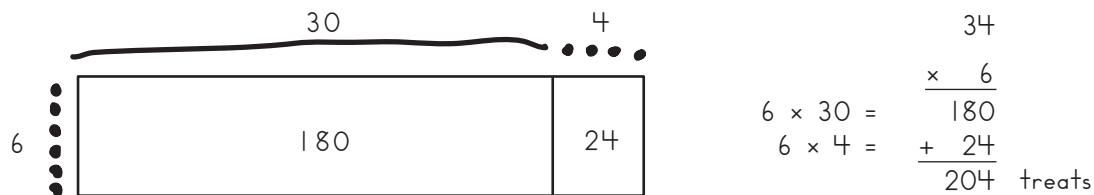


## Practice with the Standard Algorithm

Maddie and her mom got 6 boxes of treats for their dogs. There are 34 treats in each box. How many treats did they get for their dogs?

To solve this problem, multiply  $6 \times 34$ . Here are **two different methods**:

- 1** You can make a sketch and list the partial products. Then you can add them.



- 2** You can also multiply by using the standard algorithm. If you use this method, you don't have to list the partial products.

$$\begin{array}{r}
 2 \\
 34 \\
 \times 6 \\
 \hline
 204
 \end{array}$$

Multiply the ones.  $6 \times 4 = 24$  ones. Since 24 is 2 tens plus 4 ones, write the 4 in the ones place and write the 2 tens above the 3 in the tens place.

Multiply the tens.  $6 \times 3 = 18$  tens. Add the 2 tens you carried over to the 18 tens. Write 20 tens in the tens and hundreds place.

Use the standard algorithm to solve the problems below.

$$\begin{array}{r}
 23 \\
 \times 4 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 35 \\
 \times 7 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 29 \\
 \times 3 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 44 \\
 \times 4 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 67 \\
 \times 2 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 19 \\
 \times 8 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 132 \\
 \times 4 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 234 \\
 \times 3 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 416 \\
 \times 6 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 240 \\
 \times 4 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 321 \\
 \times 7 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 439 \\
 \times 5 \\
 \hline
 \end{array}$$

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Multiplication Methods** page 1 of 2Here are three different ways to solve  $4 \times 199$ .

Standard Algorithm	Partial Products	Over Strategy
$\begin{array}{r} 33 \\ 199 \\ \times 4 \\ \hline 796 \end{array}$	$\begin{aligned} 4 \times 100 &= 400 \\ 4 \times 90 &= 360 \\ 4 \times 9 &= 36 \\ 400 + 360 + 36 &= 796 \end{aligned}$	$\begin{aligned} 199 \text{ is almost like } 200 \\ 4 \times 200 &= 800 \\ 800 - 4 &= 796 \end{aligned}$

- 1** Use the standard algorithm to solve each problem below. Then solve it a different way. Label your method. Circle the method that seemed quicker and easier.

	Standard Algorithm	A Different Way
<b>a</b>	$\begin{array}{r} 37 \\ \times 4 \\ \hline \end{array}$	
<b>b</b>	$\begin{array}{r} 63 \\ \times 7 \\ \hline \end{array}$	
<b>c</b>	$\begin{array}{r} 299 \\ \times 6 \\ \hline \end{array}$	
<b>d</b>	$\begin{array}{r} 749 \\ \times 7 \\ \hline \end{array}$	

*(continued on next page)*

**Multiplication Methods** page 2 of 2

**2** Fill in the bubble to show the best estimate for each problem.

**a**

$$\begin{array}{r} 43 \\ \times 7 \\ \hline \end{array}$$

200  
 250  
 300  
 350

**b**

$$\begin{array}{r} 226 \\ \times 4 \\ \hline \end{array}$$

700  
 800  
 900  
 1,000

**c** Circle the method that seems to help most for estimating the answers to these problems.

Standard Algorithm

Partial Products

Rounding

**3** The fourth and fifth graders at King School went to the museum yesterday in 7 buses. There were 65 students on each bus. How many students were there in all? Write and solve an equation for this problem. Show all your work.

**4** **CHALLENGE** The big building downtown has 27 floors. There are 8 offices on each floor. Each office has 8 computers. How many computers are there in all? Write and solve an equation for this problem. Show all your work.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Two Different Multiplication Methods

- 1** Solve each problem below. Use the standard algorithm at least two times. Use the partial products method at least two times.

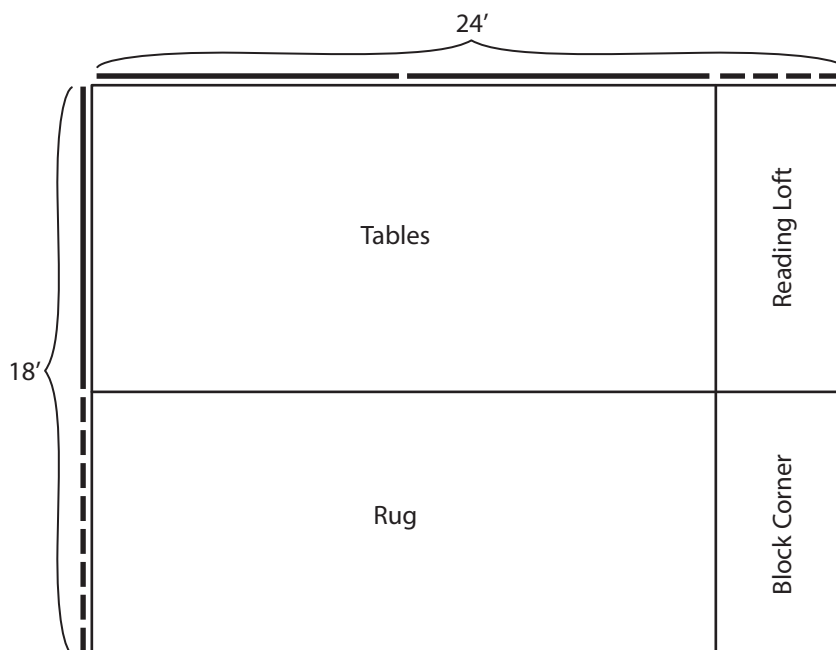
$\begin{array}{r} 12 \\ 135 \\ \times 4 \\ \hline 540 \end{array}$ <p>standard algorithm</p>	$\begin{array}{r} 135 \\ \times 4 \\ \hline 4 \times 100 = 400 \\ 4 \times 30 = 120 \\ 4 \times 5 = 20 \\ \hline 540 \end{array}$ <p>partial product</p>	$\begin{array}{r} 28 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 47 \\ \times 5 \\ \hline \end{array}$
$\begin{array}{r} 56 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 321 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 482 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 259 \\ \times 3 \\ \hline \end{array}$

- 2** Ramon bought 8 big cases of breakfast cereal. Each case held 12 boxes of cereal. How many boxes of breakfast cereal did Ramon buy?
- Restate the question in your own words:
  - Underline the information in the problem you do need to solve the problem.
  - Cross out the information in the problem you don't need to solve the problem.
  - Solve the problem. Show all your work.



## Double-Digit Multiplication Sketches page 1 of 2

- 1** Mr. Green's 1st grade classroom is 18 feet wide and 24 feet long. He is planning to divide it into 4 sections. Here is his plan. Write a multiplication equation in each section to show its area in square feet.



- a** What is the total area of the 18-by-24-foot classroom? Show your work.

- 2** Write the answers.

$$\begin{array}{r} 40 \\ \times 60 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \times 30 \\ \hline \end{array}$$

$$\begin{array}{r} 30 \\ \times 30 \\ \hline \end{array}$$

$$\begin{array}{r} 50 \\ \times 50 \\ \hline \end{array}$$

$$\begin{array}{r} 60 \\ \times 70 \\ \hline \end{array}$$

$$\begin{array}{r} 10 \\ \times 90 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \times 20 \\ \hline \end{array}$$

NAME \_\_\_\_\_

DATE \_\_\_\_\_

### Double-Digit Multiplication Sketches page 2 of 2

**3** Sketch an array for each of the frames below. Label each part with a multiplication equation to show its area. Then find the total area of the array.

<div style="text-align: center; margin-bottom: 10px;">23</div> <div style="margin-left: 20px; margin-top: 100px;">16</div> <div style="text-align: right; margin-top: 10px;">total area = _____</div>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; height: 200px; vertical-align: top; padding: 10px;"> <div style="text-align: center; margin-bottom: 10px;">14</div> <div style="margin-left: 20px; margin-top: 100px;">19</div> <div style="text-align: right; margin-top: 10px;">total area = _____</div> </td> <td style="width: 50%; height: 200px; vertical-align: top; padding: 10px;"> <div style="text-align: center; margin-bottom: 10px;">22</div> <div style="margin-left: 20px; margin-top: 100px;">14</div> <div style="text-align: right; margin-top: 10px;">total area = _____</div> </td> </tr> </table>	<div style="text-align: center; margin-bottom: 10px;">14</div> <div style="margin-left: 20px; margin-top: 100px;">19</div> <div style="text-align: right; margin-top: 10px;">total area = _____</div>	<div style="text-align: center; margin-bottom: 10px;">22</div> <div style="margin-left: 20px; margin-top: 100px;">14</div> <div style="text-align: right; margin-top: 10px;">total area = _____</div>
<div style="text-align: center; margin-bottom: 10px;">14</div> <div style="margin-left: 20px; margin-top: 100px;">19</div> <div style="text-align: right; margin-top: 10px;">total area = _____</div>	<div style="text-align: center; margin-bottom: 10px;">22</div> <div style="margin-left: 20px; margin-top: 100px;">14</div> <div style="text-align: right; margin-top: 10px;">total area = _____</div>		

**4** Write the answers.

$$\begin{array}{r} 30 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 50 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 40 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 60 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 80 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 70 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \times 8 \\ \hline \end{array}$$

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Multiples of Ten & More

**1** Write the answers.

$$\begin{array}{r} 30 \\ \times 20 \\ \hline \end{array} \quad \begin{array}{r} 20 \\ \times 30 \\ \hline \end{array} \quad \begin{array}{r} 50 \\ \times 40 \\ \hline \end{array} \quad \begin{array}{r} 40 \\ \times 50 \\ \hline \end{array} \quad \begin{array}{r} 20 \\ \times 60 \\ \hline \end{array} \quad \begin{array}{r} 30 \\ \times 70 \\ \hline \end{array} \quad \begin{array}{r} 90 \\ \times 80 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \times 9 \\ \hline \end{array} \quad \begin{array}{r} 30 \\ \times 8 \\ \hline \end{array} \quad \begin{array}{r} 60 \\ \times 7 \\ \hline \end{array} \quad \begin{array}{r} 20 \\ \times 6 \\ \hline \end{array} \quad \begin{array}{r} 40 \\ \times 8 \\ \hline \end{array} \quad \begin{array}{r} 70 \\ \times 7 \\ \hline \end{array} \quad \begin{array}{r} 90 \\ \times 9 \\ \hline \end{array}$$

**2** Multiply each number in the top row by the number at the left. The first one is done for you as an example.

×	2	4	8	3	6	12	5	10	7	9
30	60									

×	2	4	8	3	6	12	5	10	7	9
6										

×	2	4	8	3	6	12	5	10	7	9
36										

**3** Tyrone says you can use the answers in the first two charts of problem 2 to help figure out the answers in the third row. Do you agree with him? Why or why not?

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Double-Digit Multiplication** page 1 of 2

- 1** Find the product of each pair of numbers below. Make a labeled sketch to help, or just use numbers. Show all of your work.

**a**

$$\begin{array}{r} 27 \\ \times 24 \\ \hline \end{array}$$

**b**

$$\begin{array}{r} 24 \\ \times 18 \\ \hline \end{array}$$

**c**

$$\begin{array}{r} 27 \\ \times 25 \\ \hline \end{array}$$

**d**

$$\begin{array}{r} 36 \\ \times 13 \\ \hline \end{array}$$

**e**

$$\begin{array}{r} 36 \\ \times 23 \\ \hline \end{array}$$

*(continued on next page)*



**Double-Digit Multiplication** page 2 of 2

- 2** Solve the story problems below. Make a labeled sketch to help, or just use numbers. Show all of your work.
- a** Tonya works at a sporting goods store in the mall. Last week, she unpacked 28 boxes of new sweatpants. Each box had 24 pairs of sweatpants in it. How many pairs of sweatpants did she unpack?
- b** Tonya made 23 stacks of sweatshirts. She put 17 shirts in each stack. How many shirts did she stack in all?
- c** **CHALLENGE** Then Tonya made 24 stacks of shorts. She put 16 pairs of shorts in each stack. The store she works for had to pay \$4.99 for each pair of shorts. How much did they have to pay for all the pairs of shorts Tonya stacked?

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Four Partial Products Practice

Multiply to get four partial products and add them up. The first one has been done for you as an example.

$\begin{array}{r} 29 \\ \times 25 \\ \hline \end{array}$ $\begin{array}{l} 20 \times 20 = 400 \\ 20 \times 9 = 180 \\ 5 \times 20 = 100 \\ 5 \times 9 = 45 \\ \hline 725 \end{array}$	$\begin{array}{r} 37 \\ \times 24 \\ \hline \end{array}$	$\begin{array}{r} 26 \\ \times 32 \\ \hline \end{array}$
$\begin{array}{r} 45 \\ \times 36 \\ \hline \end{array}$	$\begin{array}{r} 24 \\ \times 18 \\ \hline \end{array}$	$\begin{array}{r} 76 \\ \times 15 \\ \hline \end{array}$
$\begin{array}{r} 33 \\ \times 28 \\ \hline \end{array}$	$\begin{array}{r} 53 \\ \times 39 \\ \hline \end{array}$	$\begin{array}{r} 34 \\ \times 73 \\ \hline \end{array}$

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Two-Part Multiplication page 1 of 2

1 For the following problems:

- Label the frame to show the 2 numbers that are being multiplied.
- Sketch in the rectangle and divide it into 2 parts.
- Label each of the parts with a multiplication equation.
- Add the partial products to get the answer.

$\begin{array}{r} 21 \\ \times 15 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ \times 16 \\ \hline \end{array}$
$\begin{array}{r} 22 \\ \times 12 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ \times 13 \\ \hline \end{array}$
$\begin{array}{r} 23 \\ \times 23 \\ \hline \end{array}$	$\begin{array}{r} 24 \\ \times 14 \\ \hline \end{array}$

(continued on next page)

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Two-Part Multiplication** page 2 of 2**2** For the following problems:

- Multiply the top number by the ones and then by the tens.
- Add the partial products to get the answer.

**Example**

$$\begin{array}{r}
 24 \\
 \times 12 \\
 \hline
 2 \times 24 = 48 \\
 10 \times 24 = + 240 \\
 \hline
 288
 \end{array}$$

$$\begin{array}{r}
 23 \\
 \times 13 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 25 \\
 \times 22 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 25 \\
 \times 26 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 33 \\
 \times 22 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 36 \\
 \times 12 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 42 \\
 \times 24 \\
 \hline
 \end{array}$$

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Reasonable Estimates & Partial Products

1 Fill in a bubble for each problem to show which of the estimates is best.

<b>a</b>	$21 \times 19$	<input type="radio"/>	400	<input type="radio"/>	600	<input type="radio"/>	4,000	<input type="radio"/>	6,000
<b>b</b>	$20 \times 31$	<input type="radio"/>	600	<input type="radio"/>	700	<input type="radio"/>	6,000	<input type="radio"/>	7,000
<b>c</b>	$33 \times 39$	<input type="radio"/>	600	<input type="radio"/>	800	<input type="radio"/>	1,000	<input type="radio"/>	2,000
<b>d</b>	$96 \times 22$	<input type="radio"/>	180	<input type="radio"/>	1,000	<input type="radio"/>	2,000	<input type="radio"/>	18,000

2 Use partial products to solve each problem below. Draw lines between the digits to show which numbers you multiplied. The first one has been done as an example.

$\begin{array}{r} 63 \\ \times 21 \\ \hline \end{array}$ $\begin{array}{r} 20 \times 60 = 1,200 \\ 20 \times 3 = 60 \\ 1 \times 60 = 60 \\ 1 \times 3 = + 3 \\ \hline 1,323 \end{array}$	$\begin{array}{r} 26 \\ \times 32 \\ \hline \end{array}$	$\begin{array}{r} 45 \\ \times 23 \\ \hline \end{array}$
$\begin{array}{r} 38 \\ \times 15 \\ \hline \end{array}$	$\begin{array}{r} 26 \\ \times 34 \\ \hline \end{array}$	$\begin{array}{r} 54 \\ \times 25 \\ \hline \end{array}$

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Roll Your Own Double-Digit Multiplication Problems

### Directions:

- Choose a die numbered 1–6 or 4–9.
- Roll it as many times as you need to fill in each of the boxes below. You can write each number you roll in any box on the sheet, but once all the boxes are filled, you can't change them.
- Use the method you just learned in class to solve your problems.
- When you're finished, trade papers with a classmate and have him or her check your answers.

$$\begin{array}{r} \square \square \\ \times \quad \square \\ \hline \end{array}$$

$$\begin{array}{r} \square \square \square \\ \times \quad \square \\ \hline \end{array}$$

$$\begin{array}{r} \square \square \\ \times \square \square \\ \hline \end{array}$$

$$\begin{array}{r} \square \square \\ \times \square \square \\ \hline \end{array}$$

$$\begin{array}{r} \square \square \\ \times \square \square \\ \hline \end{array}$$

$$\begin{array}{r} \square \square \\ \times \square \square \\ \hline \end{array}$$

### CHALLENGE

$$\begin{array}{r} \square \square \square \\ \times \quad \square \square \\ \hline \end{array}$$

$$\begin{array}{r} \square \square \square \\ \times \square \square \square \\ \hline \end{array}$$



## School Supplies

- 1** Mr. Wu got 35 boxes of crayons for his fourth graders. Every box had 24 crayons in it. When he got home from the store, he decided to give each of his own 3 children one of the boxes of crayons. How many crayons did he take to his fourth graders?
- a** Circle the equation below that best represents this problem. (The letter  $c$  stands for crayons.)
- $(35 \times 24) - 3 = c$       $35 \times (24 - 3) = c$       $(35 - 3) \times 24 = c$       $(35 + 3) \times 24 = c$
- b** Use the standard multiplication algorithm or partial products to solve the problem. Show all your work.
- 2** Ms. Penny got 18 packs of felt markers for her fifth graders. Each pack had 36 markers in it. When she got back to her classroom, she put half the packs away. She dumped out the rest of the markers and divided them into 6 equal sets, one for each table. How many markers did each table get?
- a** Write an equation to represent this problem.
- b** Solve the problem. Show all your work.
- 3** **CHALLENGE** The office got 15 cartons of envelopes. Each carton had 12 boxes of envelopes in it. Each box had 54 envelopes in it. How many envelopes did they get in all?
- a** Write an equation to represent this problem.
- b** Use the standard multiplication algorithm or partial products to solve the problem. Show all your work.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Reviewing Multiplication Methods

Read and review these multiplication methods with your class. Then complete the example in each strategy's box.

<p><b>Method A</b></p> <p>Use basic fact strategies.</p> <p><b>ex</b> <math>4 \times 124</math></p> <p>Double it and then double it again.</p>	<p><b>Method B</b></p> <p>Multiply to get 4 partial products and add them up.</p> <p><b>ex</b> <math>27 \times 34</math></p> $\begin{array}{r} 34 \\ \times 27 \\ \hline \end{array}$
<p><b>Method C</b></p> <p>Multiply by the tens and then by the ones. Add the partial products.</p> <p><b>ex</b> <math>16 \times 25</math></p> $\begin{array}{r} 25 \\ \times 16 \\ \hline \end{array}$	<p><b>Method D</b></p> <p>Use the over strategy.</p> <p><b>ex</b> <math>3 \times 299</math></p> $\begin{array}{r} 299 \\ \times 3 \\ \hline \end{array}$
<p><b>Method E</b></p> <p>Use the standard algorithm.</p> <p><b>ex</b> <math>46 \times 73</math></p> $\begin{array}{r} 73 \\ \times 46 \\ \hline \end{array}$	





## Evaluating Multiplication Methods page 1 of 2

For each problem on this page and the next,

- Write the letter of the method you think will work best.
- Use the method to solve the problem. Show all your work.

- 1** People need to drink about 8 cups of water each day. Zoo elephants need to drink about 158 quarts of water each day. How many cups of water are there in 158 quarts of water? (Remember that there are 4 cups in a quart.)

I think method \_\_\_\_\_ will work best for this problem.

- 2** So far, the elephant keeper has brought in 40 gallons of water for the elephants. How many cups of water are there in 40 gallons? (Remember that there are 16 cups in a gallon.)

I think method \_\_\_\_\_ will work best for this problem.

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Evaluating Multiplication Methods** page 2 of 2

- 3** Zoo elephants eat about 175 pounds of food a day. Most of their food is hay, but they also eat fruits and vegetables. How many pounds of food would it take to feed 26 elephants for one day?

I think method \_\_\_\_\_ will work best for this problem.

- 4** Each elephant at our zoo gets about 45 pounds of vegetables a day. How many pounds of vegetables does it take to feed one elephant for 49 days (7 weeks)?

I think method \_\_\_\_\_ will work best for this problem.

- 5** **CHALLENGE** An elephant can spend up to 18 hours a day eating. How many hours would that total in one year? About how many months' worth of time is that?

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Addition & Subtraction Review

1 Use the standard addition algorithm to solve the problems below.

$$\begin{array}{r} 457 \\ + 142 \\ \hline \end{array}$$

$$\begin{array}{r} 387 \\ + 414 \\ \hline \end{array}$$

$$\begin{array}{r} 609 \\ + 734 \\ \hline \end{array}$$

$$\begin{array}{r} 1,589 \\ + 3,437 \\ \hline \end{array}$$

2 Use the standard subtraction algorithm to solve the problems below.

$$\begin{array}{r} 803 \\ - 547 \\ \hline \end{array}$$

$$\begin{array}{r} 745 \\ - 548 \\ \hline \end{array}$$

$$\begin{array}{r} 985 \\ - 237 \\ \hline \end{array}$$

$$\begin{array}{r} 3,581 \\ - 1,346 \\ \hline \end{array}$$

3 Fill in the missing numbers to make each equation true.

$100 = \underline{\quad} + (30 - 5)$

$100 \times 2 \times \underline{\quad} = 1,000$

$4 = \underline{\quad} \div (3 \times 2)$

$\underline{\quad} = 100 - (28 + 13)$

### CHALLENGE

$18 \times 2 = \underline{\quad} \times 4$

$90 \div \underline{\quad} = 5 \times 9$

4 **CHALLENGE** Fill in the missing digits.

$$\begin{array}{r} 5 \square \\ - 248 \\ \hline \square 88 \end{array}$$

$$\begin{array}{r} \square 0 \square \\ - 1 \square 9 \\ \hline 223 \end{array}$$

$$\begin{array}{r} \square 82 \\ - 1, \square \\ \hline 405 \end{array}$$

$$\begin{array}{r} \square, 246 \\ - 1, \square 2 \square \\ \hline 2, 9 \square 7 \end{array}$$

$$\begin{array}{r} 3, 0 \square 8 \\ - 1, \square 9 \square \\ \hline \square, 712 \end{array}$$

$$\begin{array}{r} 50, 6 \square 3 \\ - \square 7, \square 5 5 \\ \hline 1 \square, 13 \square \end{array}$$



# Secret Paths & Multiplication Tables

**1** Use multiplication and division to find the secret path through each maze. The starting and ending points are marked for you. You can only move one space up, down, over, or diagonally each time. Write four equations to explain the path through the maze.

<p>start</p> <table border="1" style="margin: 0 auto; text-align: center;"> <tr><td>3</td><td>4</td><td>12</td></tr> <tr><td>36</td><td>6</td><td>2</td></tr> <tr><td>9</td><td>4</td><td>6</td></tr> </table> <p style="text-align: center;">end</p> <p style="text-align: center;"> <math>3 \times 4 = 12</math>  <math>12 \div 2 = 6</math>  <math>6 \times 6 = 36</math>  <math>36 \div 9 = 4</math> </p>	3	4	12	36	6	2	9	4	6	<p style="text-align: center;">start</p> <table border="1" style="margin: 0 auto; text-align: center;"> <tr><td>42</td><td>6</td><td>6</td></tr> <tr><td>7</td><td>4</td><td>36</td></tr> <tr><td>3</td><td>3</td><td>9</td></tr> </table> <p style="text-align: center;">end</p>	42	6	6	7	4	36	3	3	9	<table border="1" style="margin: 0 auto; text-align: center;"> <tr><td>6</td><td>24</td><td>3</td></tr> <tr><td>4</td><td>8</td><td>72</td></tr> <tr><td>28</td><td>7</td><td>9</td></tr> </table> <p style="text-align: center;">end</p>	6	24	3	4	8	72	28	7	9
3	4	12																											
36	6	2																											
9	4	6																											
42	6	6																											
7	4	36																											
3	3	9																											
6	24	3																											
4	8	72																											
28	7	9																											

**2** Complete the multiplication charts below.

×	2	9	4	7	5	3	6	8
6	12							

×	2	9	4	7	5	3	6	8
7								

×	2	9	4	7	5	3	6	8
8								

**CHALLENGE**

×	12	18	22	24	36	25	27	35
5								

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Playground Safety

- 1** Ms. Li's class took a vote on what they thought might be unsafe playground equipment. Their data is shown below.

Unsafe Items	Votes
Skateboard ramp	6
Obstacle course	4
Bike jump	4
Bungee jump	7
Bouncy castle	3
Ball pit	5

- a** Make a line plot of their data. Label the horizontal axis and give the graph a title.

Number of Votes

- b** What is the range of the voting data?
- c** What is the mode of the data?
- d** What item(s) do you think Ms. Li's students removed from their list of potential playground equipment? Explain your reasoning.

**Grassy Field** page 1 of 2

- 1 What does our grass need to grow and thrive?
  
  
  
  
  
  
  
  
  
  
- 2 Which items will cost money?
  
  
  
  
  
  
  
  
  
  
- 3 What are the dimensions of 1 carton? Record them below in inches and centimeters.  
Customary: \_\_\_\_\_ in.  $\times$  \_\_\_\_\_ in.      Metric: \_\_\_\_\_ cm  $\times$  \_\_\_\_\_ cm
  
  
  
  
  
  
  
  
  
  
- 4 What are the possible rectangular arrangements of our field if we have \_\_\_\_\_ cartons? Circle the arrangement the class will use.
  
  
  
  
  
  
  
  
  
  
- 5 Sketch the rectangle of our field below. What are the actual dimensions of our field in inches? Label them on your sketch. Show all your work.

What is the area of our small field in square inches? Show all your work.

*(continued on next page)*

**Grassy Field** page 2 of 2

**6** What is the mass of soil contained in 1 carton? Record it below.

**7** Describe how you found the mass of the soil that fills 1 carton.

**a** What is the mass of the soil we used for our entire field? Show all your work.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Grass Data Log

- 1** Record the data you collect each day in the table below.
- You do not need to water the grass every day, just when the soil is dry to the touch.
  - If you do not water the grass, write 0 in the water amount column for that day.
  - Write 0 in the height column until the grass starts to grow.
  - When the grass begins to grow, measure the height of the tallest blade of grass.

Planting Date:			
Day	Height of Grass (in.)	Height of Grass (cm)	Water Amount (cups)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
Notes:			



NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Our Grassy Field

Record the length of one side of the base of a carton: \_\_\_\_\_ centimeters.

Our small field has \_\_\_\_\_ cartons arranged in a(n) \_\_\_\_\_  $\times$  \_\_\_\_\_ rectangle.

**1** What is the length and width of our small field in centimeters? Sketch the rectangular field and label the dimensions below. Show all your work.

**2** What is the area of our small field in square centimeters? Show all your work.

**3** Why is it important to calculate the dimensions and area of our small field?

**4** Solve the following problems.

$$50 \times (6 + 4) = \underline{\quad}$$

$$7 \times (3 + 50) = \underline{\quad}$$

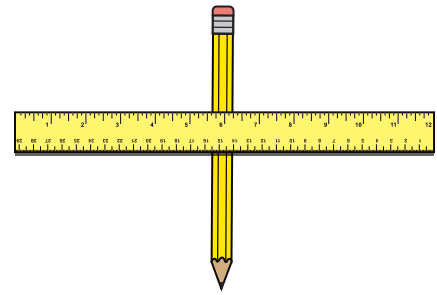
$$(7 + \underline{\quad}) \times 50 = 500$$

$$\underline{\quad} = 50 \times (4 + 16)$$

NAME \_\_\_\_\_

DATE \_\_\_\_\_

 **Fulcrum Investigation** page 1 of 2



Set up your seesaw experiment like the picture.

- 1** Investigate what happens when you move the fulcrum. Record your predictions and results below.

Placement of Fulcrum	Predicted Number of Tiles to Lift Sarah	Actual Number of Tiles to Lift Sarah	Number of Pounds Tiles Represent	Something Similar in Weight
4"				
5"				
6"				
7"				
8"				

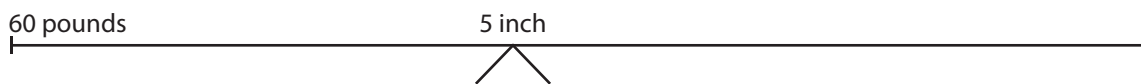
- 2** What do you notice about the data for the 4-inch and 8-inch placements?

- 3** Complete the diagram below to show your results.

**Fulcrum Experiment Diagram**

**Weight on this end**

**Weight needed to lift**



*(continued on next page)*

**Fulcrum Investigation** page 2 of 2

**4** What does the data tell you? Write at least two observations.

Use the results of your investigations and your seesaw materials to answer the following questions.

**5** Sarah is seesawing with a 7th grader who weighs 100 pounds. Where should she place the fulcrum to lift and balance the 7th grader? Explain your reasoning.

**6** Sarah has a first-grade friend who weighs 40 pounds. Where should she place the fulcrum to balance with the 1st grader? Explain your reasoning.

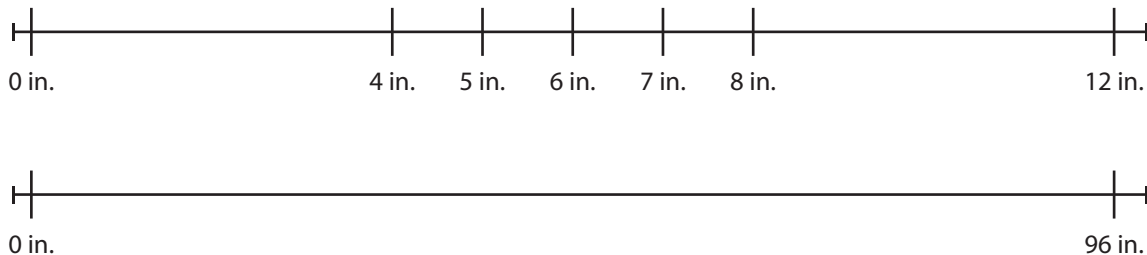


## Scale Diagram page 1 of 2

The real seesaw is 8 feet long. Our model seesaw is 12 inches long.

- 1 How many inches long is the real seesaw? Show your work using word, numbers or labeled sketches.
  
- 2 How does that compare to our model seesaw?
  
- 3 Look at the partially completed Scale Diagram below. Fill in the rest of the diagram to help find where to place the fulcrum on the real seesaw.

### Scale Diagram



Use your data, the Fulcrum Experiment Diagram, and the Scale Diagram to help you answer the following questions.

- 4 Where should we place the fulcrum on the real seesaw for Sarah to balance with another 60-pound 4th grader?
  - a How many feet is that from the end of the seesaw?

*(continued on next page)*

**Scale Diagram** page 2 of 2

- 5** Where should we place the fulcrum on the real seesaw for Sarah to balance with a 40-pound first grade student?
- a** How many feet is that from the end of the seesaw?
- 6** Sarah's 160-pound teenaged brother wants to balance with Sarah. Where should we place the fulcrum on the real seesaw?
- a** How many feet is that from the end of the seesaw?
- 7** **CHALLENGE** If Sarah can't move the fulcrum from the middle of the seesaw, what can she do to balance with the 40-pound first grader? Why does this method work?

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Twelve-Foot Seesaw

- 1** Ms. Li's class conducted an experiment with a model seesaw using a pencil, yardstick, and tiles. Their results are in the table below.

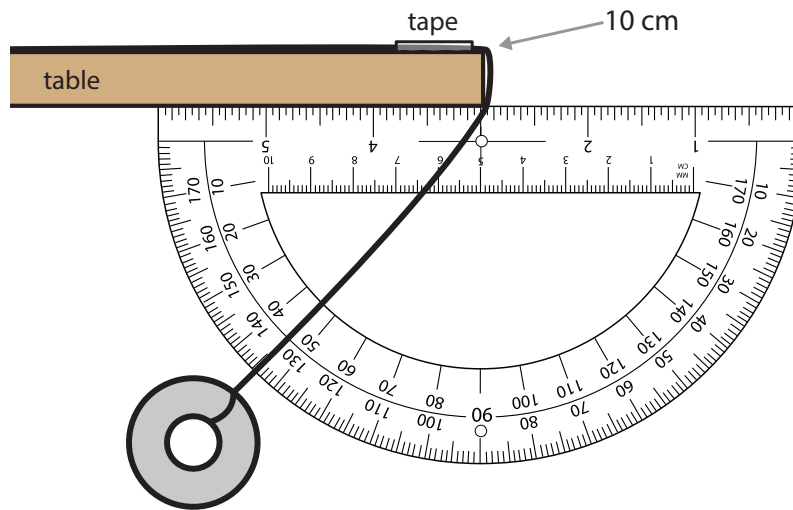
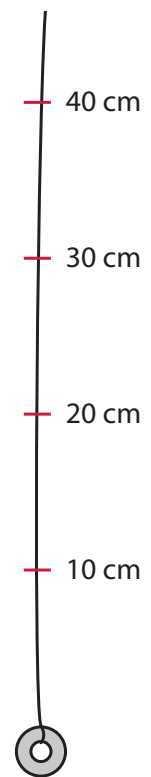
Weight on one end (lbs)	Fulcrum position	Weight needed to lift (lbs)
60	12 inches	30
60	15 inches	40
60	18 inches	60
60	21 inches	80
60	24 inches	120

- 2** The real seesaw on their playground is 12 feet long. Their model seesaw is 36 inches long.
- a** How many inches long is the real seesaw? Show all your work.
- b** How does that compare to the length of their model seesaw?
- 3** Where should they place the fulcrum on the real seesaw for a 60-pound 4th grader to balance with a 120-pound high school student? Show your work.
- 4** **CHALLENGE** Where do you think they should place the fulcrum on the real seesaw to lift a toddler who weighs 20 pounds? Explain your thinking.

## Pendulum Swing page 1 of 3

Follow these directions to set up your pendulum swing.

- Cut a piece of string 60 cm long. Tie a washer to the end of the string.
- Use a ruler to measure 10 cm from the top of the washer along the string and make a mark with your colored marker. Then measure from that mark another 10 cm up the string and make a mark. Continue to make marks every 10 cm.
- Tape the pendulum string to the edge of your table at the 10 cm mark. Place the tape close to the edge.
- One team member holds a protractor behind the string and against the bottom of your table. Make sure the string lines up with the  $90^\circ$  line.
- Another team member pulls the washer to the side at a  $45^\circ$  angle, then lets go. Make sure the pendulum swings freely and doesn't hit anything.



## Conducting the Length Experiment

- 1 Write your prediction for the number of times you think the pendulum will swing back and forth in 10 seconds. Record your estimate in the table.
  - One team member times the swing for 10 seconds, one holds the protractor, and the other counts the actual number of back and forth swings.
  - Line up the string at the  $45^\circ$  angle mark, let go, and start counting. Record the actual number of swings in the table.

*(continued on next page)*

**Pendulum Swing** page 2 of 3

**2** Now move the pendulum swing to the 20-centimeter mark and re-tape it to the table. Predict how many times you think the pendulum will swing back and forth. Record your estimate in the table.

- Change jobs to time the swing for 10 seconds, hold the protractor, and count the actual number of back and forth swings.
- Line up the string at the  $45^\circ$  angle mark, let go, and start counting. Record the actual number of swings in the table.
- Repeat the same process for the 30- and 40-centimeter lengths.

Pendulum Test with 1 Washer		
Pendulum Length	Estimate of Number of Swings in 10 Seconds	Actual Number of Swings in 10 Seconds
10 cm		
20 cm		
30 cm		
40 cm		

**3** Does the length of the string affect the number of swings?

**4** Describe at least two things you notice about the data.

*(continued on next page)*



**Pendulum Swing** page 3 of 3**Conducting the Weight Experiment**

Tie or tape another washer next to the washer on your pendulum. Make sure the distance from the washers to the first mark on the string is still 10 cm.

- 5** Write your prediction for the number of times you think the pendulum with 2 washers will swing back and forth in 10 seconds. Record your estimate in the table.
- One team member times the swing for 10 seconds, one holds the protractor, and the other counts the actual number of back and forth swings.
  - Line up the string at the  $45^\circ$  angle mark, let go, and start counting. Record the actual number of swings in the table.
  - Repeat the same process for the 20-, 30-, and 40-centimeter lengths.

Pendulum Test with 2 Washers		
Pendulum Length	Estimate of Number of Swings in 10 Seconds	Actual Number of Swings in 10 Seconds
10 cm		
20 cm		
30 cm		
40 cm		

- 6** Compare the two sets of data, and describe at least two things you notice about them.



NAME \_\_\_\_\_

DATE \_\_\_\_\_

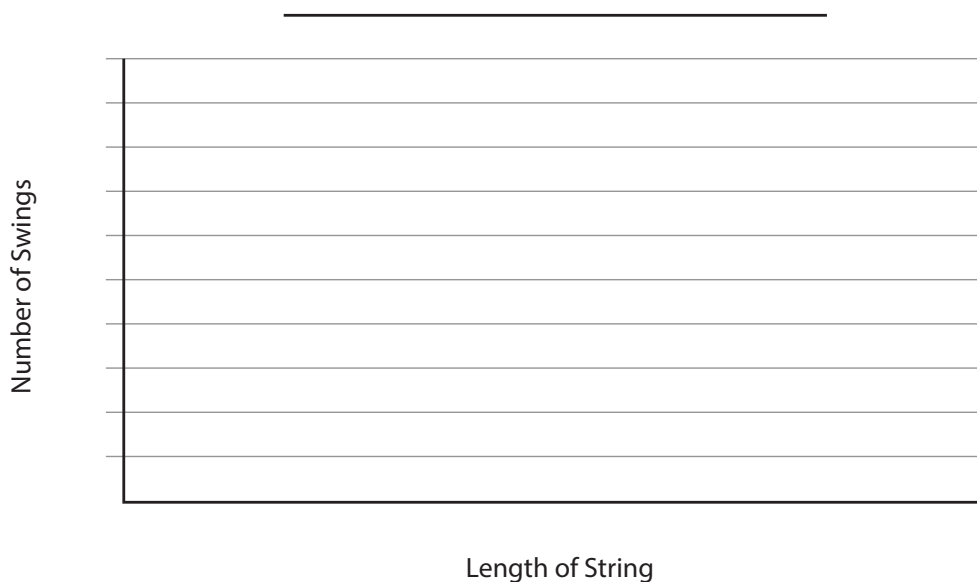


## Another Pendulum Swing Experiment

- 1** Ms. Li's class tested a different variable on a pendulum swing. Instead of starting the pendulum at a  $45^\circ$  angle, they tried a  $70^\circ$  angle. They also let the pendulum swing for a longer time—20 seconds instead of only 10. Their results are below.

Length of String	Swings in 20 Seconds
10 cm	31
20 cm	23
30 cm	19
40 cm	15

- a** Make a bar graph that relates the number of swings (on the vertical axis) to the string length (on the horizontal axis).



- b** Look at the graph. Predict the number of swings a pendulum with a string that is 50 centimeters in length will make in 20 seconds.

- 2** Think back to the data you collected earlier in class for the weight and length of your pendulum. Thinking about that data and this data, does the angle where the pendulum starts make a difference? Explain your reasoning in your math journal, using numbers, words, or pictures.



## Slide Experiment page 1 of 2

- 1 The neighborhood slide has a  $30^\circ$  angle where it meets the ground. Use your protractor to draw and label a side view of the neighborhood slide.
  
- 2 Using the 15-centimeter slide held at a  $30^\circ$  angle, slide a tile down the slide. Record your results in the table below, then repeat the experiment.

15-Centimeter Slide Results			
Slide Angle (degrees)	Test 1 Distance (cm)	Test 2 Distance (cm)	Mean (Average) Distance (cm)
$30^\circ$			

- a To be safe, the tile should not land more than 3 centimeters from the end of the slide. What do you predict is a safe angle? Explain your reasoning.
  
- b Experiment with different angles of the slide in  $5^\circ$  increments, and record your results in the table above. Test each angle two times.
  
- c Which angle do you recommend so the slide is safe? Explain your reasoning.

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Slide Experiment** page 2 of 2

- 3** Now experiment with the 20-centimeter slide to see if it makes a difference in how far the tile lands beyond the end of the slide. Use the same angles that you did for the 15-centimeter slide, and record your results in the table below.

20-Centimeter Slide Results			
Slide Angle (degrees)	Test 1 Distance (cm)	Test 2 Distance (cm)	Mean (Average) Distance (cm)
30°			

- a** Explain what you notice about this data in comparison to the shorter slide's data.

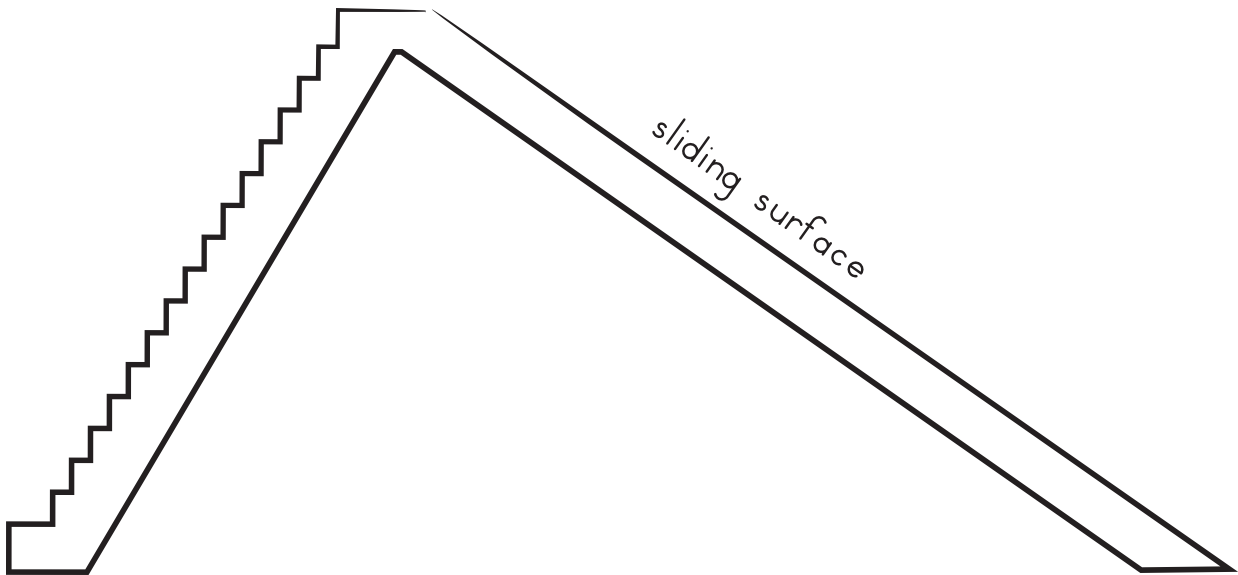
- 4** Sketch a side view of the slides that you think will keep students safe. Sketch one for the 15 cm slide and one for the 20 cm slide. Use your protractor and ruler to measure both the angle and length accurately, and label them on your sketches.

- a** If the actual slides are 20 times as large as our models, how long are the real slides in centimeters?

- b** How long are the actual slides in meters?

**Two More Slides** page 1 of 2

- 1** Jasmine drew a picture of a slide at a neighborhood playground. Measure the slide with your protractor and ruler.



- a** What is the angle of the slide where it meets the ground?
- b** How many centimeters long is the sliding surface of the slide drawing?

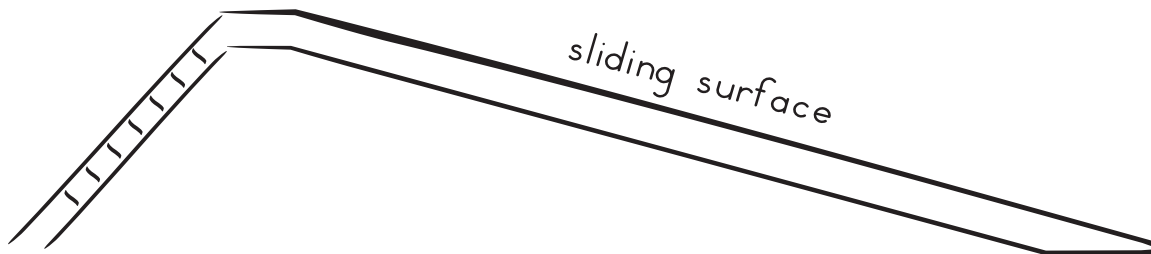
The actual slide is 25 times as large as the drawing.

- c** How long is the sliding surface of the actual slide in centimeters?
- d** How long is the sliding surface of the actual slide in meters?
- e** What changes are needed to make the slide safer for students?

*(continued on next page)*

**Two More Slides** page 2 of 2

- 2** Jasmine drew a picture of a different slide from a city park. Measure the slide with your ruler and protractor. Label the length in centimeters and the degrees of the angle.

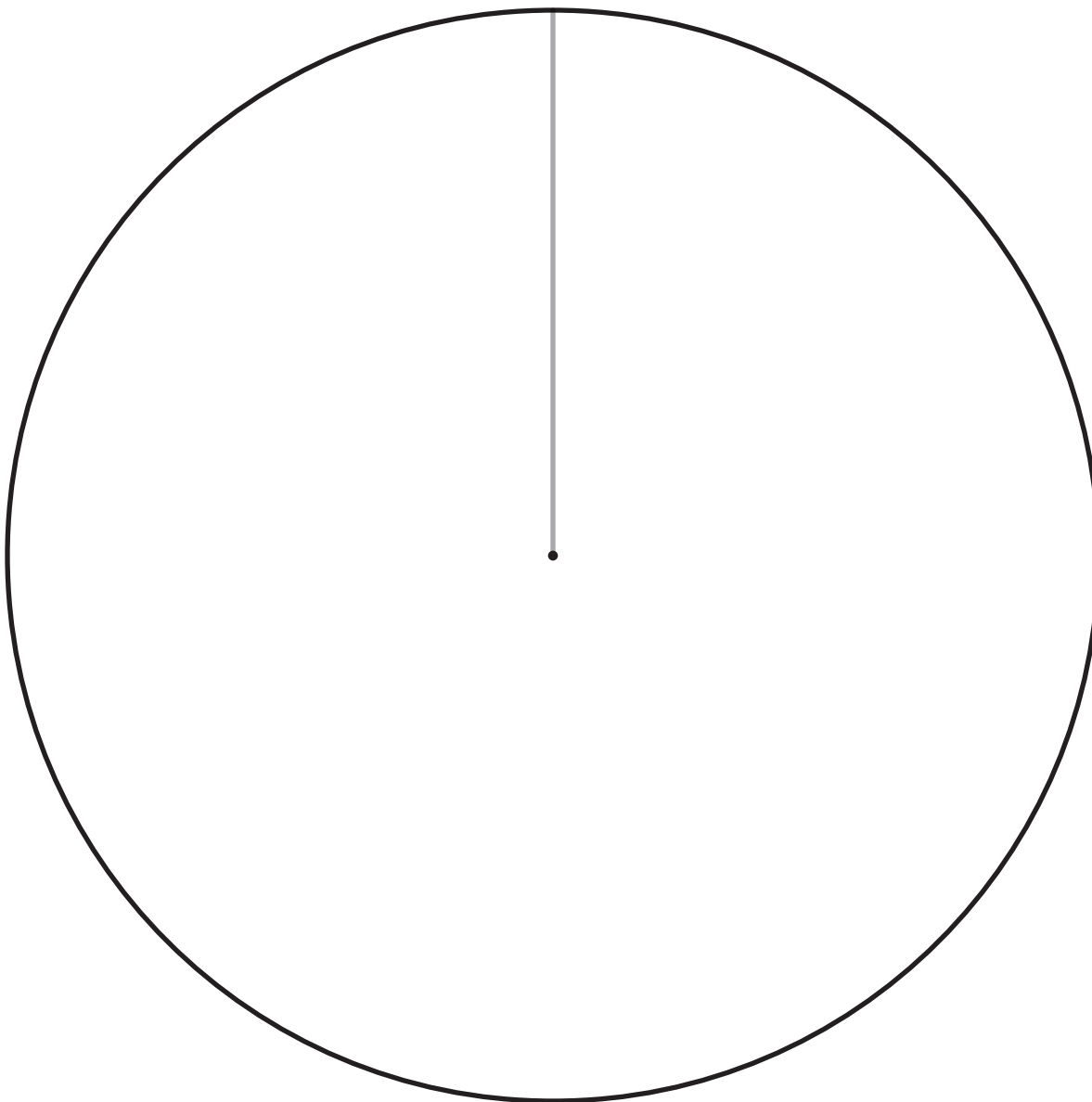


- a** Is this slide safe? Explain your reasoning.
- b** If the actual city park slide is 30 times as large as the drawing, how long is its sliding surface in centimeters?
- c** How long is the sliding surface of the actual city park slide in meters?




## Merry-Go-Round Bars page 1 of 2

- 1** Use hexagon pattern blocks to represent the space an older student needs to ride on the merry-go-round. Experiment until you find the greatest number of hexagons that can fit on the merry-go-round with each one still having an equal amount of space.
- Sketch good designs on scratch paper or in your math journal as you work.
  - When you have a design that will fit the most students, draw it on the diagram below. Use your protractor to divide the merry-go-round into equal sections, and draw lines where the bars will go. The first bar has been drawn already.
  - Draw hexagons in each section of your merry-go-round design to show how they fit. Use a hexagon pattern block to trace their exact size.



### Legend

1  = 1 older student

Part of the circle needed per student = \_\_\_\_\_

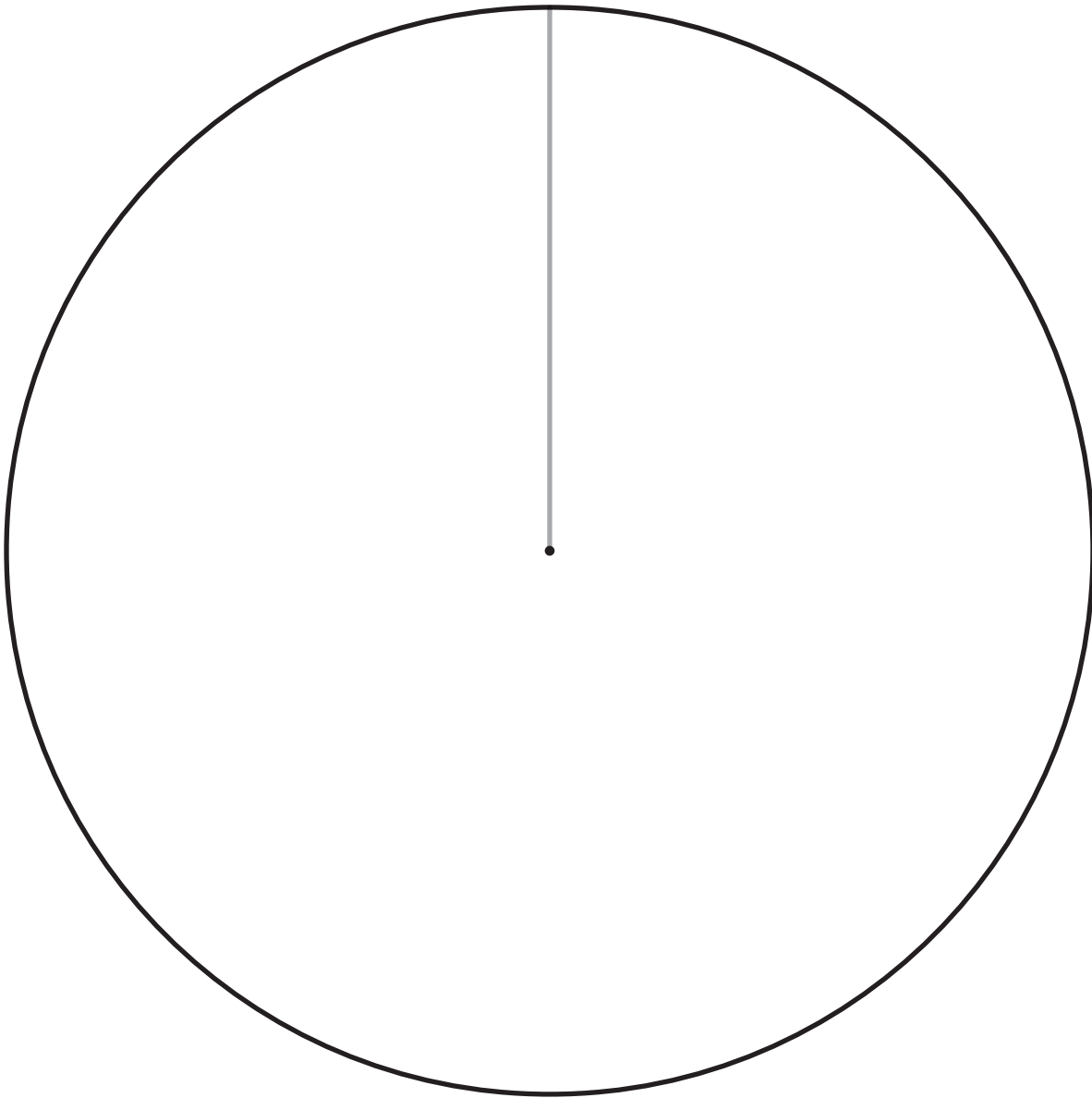

*(continued on next page)*



**Merry-Go-Round Bars** page 2 of 2

**2** Use trapezoid pattern blocks to represent the amount of space a younger student needs to ride the merry-go-round. Experiment again to find the greatest number of trapezoids that can fit with each one having an equal amount of space to ride.

- Sketch good designs on scratch paper or in your math journal as you work.
- When you have a design that will fit the most number of younger students, draw it on the diagram below. Use your protractor to divide the merry-go-round into equal sections, and draw lines where the bars will go. The first bar has been drawn already.
- Draw trapezoids in each section of your merry-go-round design to show how they fit. Use a trapezoid pattern block to trace their exact size.

**Legend**1  = 1 younger student

Part of the circle needed per student = \_\_\_\_\_

NAME \_\_\_\_\_

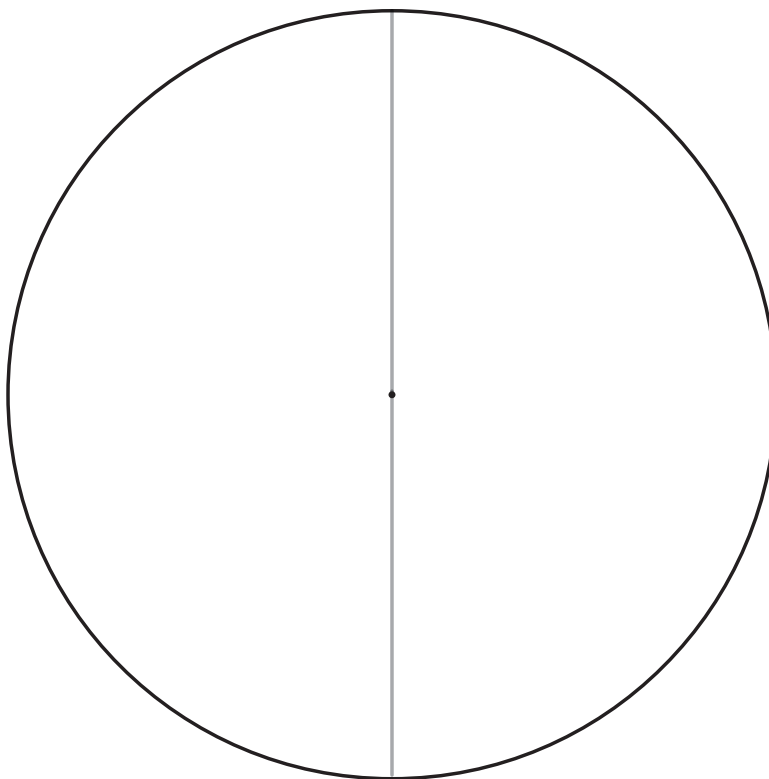
DATE \_\_\_\_\_



## Preschoolers' Merry-Go-Round

Use your protractor, ruler, and a green triangle pattern block to find the greatest number of preschoolers who can fit on the merry-go-round so each child has equal space.

- 1 Draw the lines for the bars on the merry-go-round, then fill in the legend below.

**Legend**1  = 1 preschooler

Part of the circle needed per preschooler = \_\_\_\_\_

- 2 Using colored pencils or markers, symmetrically color in your design.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## The Current Playground

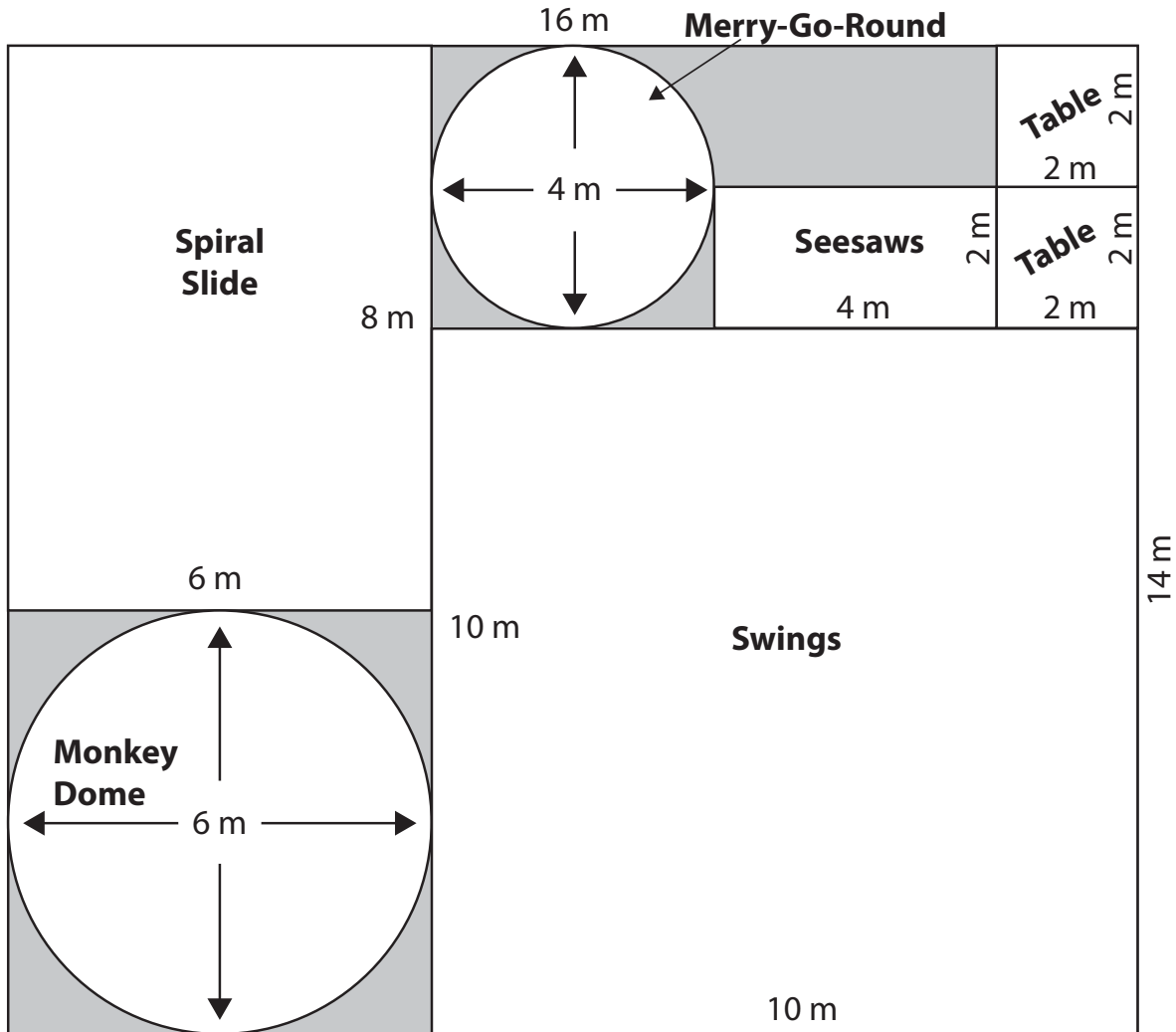
- 1 On a separate sheet of paper, draw a large sketch of the playground area. Show all the items on the playground, including seating, trash receptacles, drinking fountains, playground equipment and game areas.
- 2 Work with your team to take measurements of the playground using both metric and customary units. Record the measurements on your sketch.
  - Measure the perimeter of the playground.
  - Find the width and length of the large items (or of the space they need).
- 3 Look for safety issues in the playground and note them on your sketch.
  - Is there enough room between the playground equipment?
  - Is there proper surface material?
  - Are there items that need to be replaced or changed?
- 4 Make a list of the simple machines you see on the playground. Use another piece of paper or your math journal if you need more room.

Playground Item	Simple Machine(s)

- 5 **CHALLENGE** Calculate and label the areas of as many playground items as you can. Calculate the area of the whole playground, too. Hint: Divide unusually shaped areas into smaller areas that are easier to work with.

 **Measuring the Playground** page 1 of 2

The city council of Waterton decided to build a public playground in the city park. They asked playground builders to give them prices for the project, and they included this drawing to help the builders come up with price estimates. The drawing shows how much space each piece of play equipment needs and groups them together in the space the city has available to use for the playground.



- 1 What is the total area of the playground (including space not used by any of the pieces of equipment)?

*(continued on next page)*

**Measuring the Playground** page 2 of 2

- 2** The monkey dome only needs a circular space, but the city wants it to have a square sawdust pit.
- a** What will the area of the sawdust pit be?
- b** What will the sawdust pit's perimeter be?
- 3** One of the builders asked if the city would like the playground to be fenced. What length of fencing would they need to surround the whole perimeter of the playground?
- 4** Another builder suggested that the city add a sandbox to the playground. Where would you add the sandbox? Draw it on the plan and mark its dimensions.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Growing Grass

Javier recorded the amount of water he gave his grass and how high it grew.

Day	Height of Grass (in.)	Height of grass (cm)	Water Amount (cups)
1	0	0	$\frac{1}{2}$
2	0	0	0
3	0	0	$\frac{1}{4}$
4	0	0	$\frac{1}{4}$
5	$\frac{1}{8}$	0.3	$\frac{3}{4}$
6	$\frac{3}{8}$	0.9	0
7	$\frac{1}{2}$	1.2	$\frac{1}{2}$
8	$\frac{1}{2}$	1.2	$\frac{1}{4}$

**1** How much water has Javier given the grass so far?

Answer the following questions in both inches and centimeters.

**2** How much did the grass grow between day 5 and day 8?

**3** Between which two days did the grass grow the most? How much did it grow?

NAME \_\_\_\_\_

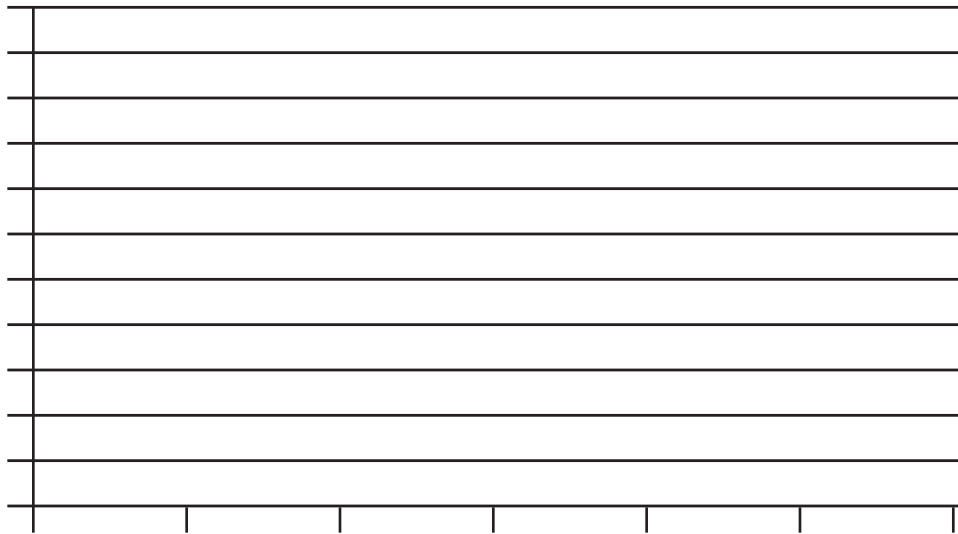
DATE \_\_\_\_\_



## Ranking by Another Class

One team from Ms. Li's class calculated the following tallies of votes for their important playground items. Make a bar graph of their voting results.

Our Team	
spiral slide	$3 + 4 + 1$
basketball	$2 + 1$
merry-go-round	$2 + 4$
climbing wall	$4 + 3 + 1$
play structure	$2 + 3$



**1** What items are most important to this team?

**2** What items are least important to them?

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Playground Costs

- Gather and enter information about the cost of each playground item on your list.
  - Use at least two different sources. Write all of your source names below.
- As you research the prices of playground equipment, enter prices in the table below.
  - Find and record two different prices for each item.
  - Calculate and record the average price for each item.

Playground Costs			
Items	Source 1 Price	Source 2 Price	Average Price
<b>Total</b>			

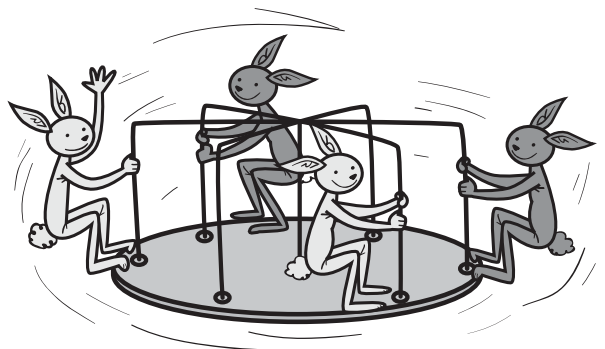
- Calculate the total average price and enter it in the table. Show your work below.



 **Analyzing the Playground Costs**

Look at the bar graph of the class's total average costs.

- 1** What do you notice about the data? Describe at least two observations.
  
  
  
  
  
  
  
  
  
  
- 2** What is the range of the costs?
  
  
  
  
  
  
  
  
  
  
- 3** What is the mean of the costs?
  - a** Why is it useful to calculate the mean of the costs? How could you use this number to plan for the new playground?
  
  
  
  
  
  
  
  
  
  
- 4** How does your total average cost compare to the class total average cost?





## Estimate & Reason with Jam

- 1** Every summer, June makes strawberry jam to sell at a farm market. Last year, June made \$330 selling jam. This year the strawberry crop is very good, and June expects to make \$440. June believes that with the extra income, she'll be able to buy a new e-book (costing between \$5.99 and \$9.99) every month next year. Is she correct? Why or why not?

- 2** Jack plans to buy 6 pints of June's jam this year. The jam cost \$4.50 per pint last year. He knows the price will probably increase this year. Jack estimates what he might have to pay for 6 pints of jam using the following expression:

$$(6 \times 4.50) + (6 \times i)$$

- a** What does the  $i$  in Jack's expression mean?
- b** **CHALLENGE** If each pint of jam costs \$6.25 this year, how much more will Jack pay for 6 pints this year than he paid for 6 pints last year?



## Analyzing the Results

- 1 What is the range of the survey data?
- 2 What is the mode of the survey data?
- 3 Compare the survey graph to the graphs of class data and team data. How do the graphs differ? How are they the same? Write at least two observations comparing the graphs.
- 4 What three items are most important to include in the playground design? Use the graphs to justify your answer. Explain your thinking using numbers and words.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## More Growing Grass

Javier continued to record the amount of water he gave his grass and how much the grass grew.

Day	Height of Grass (in.)	Height of Grass (cm)	Water Amount (cups)
1	0	0	$\frac{1}{2}$
2	0	0	0
3	0	0	$\frac{1}{4}$
4	0	0	$\frac{1}{4}$
5	$\frac{1}{8}$	0.3	$\frac{3}{4}$
6	$\frac{3}{8}$	0.9	0
7	$\frac{1}{2}$	1.2	$\frac{1}{2}$
8	$\frac{1}{2}$	1.2	$\frac{1}{4}$
9	$\frac{5}{8}$	1.5	0
10	$\frac{3}{4}$	1.8	$\frac{1}{4}$
11	1	2.4	$\frac{1}{8}$

**1** How much water has Javier given the grass since day 8?

Answer the following questions in both inches and centimeters.

**2** How much has the grass grown between day 8 and day 11?

**3** How much has the grass grown between day 6 and day 11?



## Planning Their Playground

- 1** The playground at Ms. Li's school has a perimeter of 180 meters. What is the largest possible area of the playground? Show your work.
- 2** Ms. Li's class is planning a dream playground, and for it they want a play structure that needs 400 square meters of space. If the playground has the area you calculated in item 1, how much room would be left for the other playground items?
- 3** The slide Ms. Li's class wants needs a space of  $6 \times 15$  meters, the swings need  $16 \times 12$  meters, and the climbing wall needs  $18 \times 9$  meters. Sarah says that over half the playground space would be left after these items were installed. Is she correct? Show your reasoning.





NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Ever-Growing Grass

Javier continued recording the amount of water he gave his grass and how much it grew.

Day	Height of Grass (in.)	Height of Grass (cm)	Water Amount (cups)
1	0	0	$\frac{1}{2}$
2	0	0	0
3	0	0	$\frac{1}{4}$
4	0	0	$\frac{1}{4}$
5	$\frac{1}{8}$	0.3	$\frac{3}{4}$
6	$\frac{3}{8}$	0.9	0
7	$\frac{1}{2}$	1.2	$\frac{1}{2}$
8	$\frac{1}{2}$	1.2	$\frac{1}{4}$
9	$\frac{5}{8}$	1.5	0
10	$\frac{3}{4}$	1.8	$\frac{1}{4}$
11	1	2.4	$\frac{1}{8}$
12	$1\frac{1}{8}$	2.7	0
13	$1\frac{1}{4}$	3	$\frac{1}{2}$
14	$1\frac{5}{8}$	4	$\frac{1}{8}$

**1** How much water has Javier given the grass since day 11?

Answer the following questions in both inches and centimeters.

**2** How much did the grass grow between day 11 and day 14?

**3** How much did the grass grow between day 5 and day 14?



NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Water Graph

The tables below show the amounts of water used by the students in Ms. Li's class.

Water Amount (Cups)			
$4\frac{7}{8}$	$5\frac{3}{4}$	$4\frac{7}{8}$	$3\frac{3}{4}$
$2\frac{5}{8}$	$3\frac{3}{4}$	$4\frac{3}{4}$	$5\frac{3}{4}$
$3\frac{3}{8}$	$4\frac{5}{8}$	5	4
$2\frac{1}{4}$	$5\frac{3}{8}$	$3\frac{3}{8}$	5
2	$2\frac{1}{4}$	$3\frac{1}{2}$	$4\frac{1}{8}$
$6\frac{7}{8}$	$5\frac{1}{8}$	4	$3\frac{1}{8}$
$6\frac{1}{2}$	$4\frac{1}{2}$	2	3

- 1** Draw a line plot showing the amount of water each student used. Give the plot a title and labels.

---



---



---



---

- a** What is the range of the data?
- b** What does the line plot tell you about the data? Write at least two observations. Use another sheet of paper or your math journal if you need more room.



NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Field Measurements

Ms. Li's class found the following measurements for their model grassy field. The dimensions of their new real field will be 150 times as large as the model field they grew.

Field Measurements	
Our Field (Scale 1:150)	New Field
<b>Dimensions:</b> 30" by 15"	<b>Dimensions:</b>
<b>Area:</b> 450 square inches	<b>Area:</b>
<b>Mass of Soil:</b> 5,400 g	<b>Mass of Soil:</b>

- 1 What are the dimensions of the real field in customary units (yards, feet, and inches)?
  
  
  
  
  
  
  
  
  
  
- 2 What is the area of the real field in square yards? Show all your work.
  
  
  
  
  
  
  
  
  
  
- 3 What is the mass of the soil needed for the real field? Give the mass in kilograms.



## **New Field Costs** page 1 of 2

The parents' group needs information about the cost of the new field. They gathered the following information for the cost of soil, water, and grass seed.

- soil – \$3.00 per 100 kilograms
- grass seed – \$1.00 per 1000 square yards
- water – 1 cent per gallon

**1** Determine the cost of soil needed for the new field. Show all of your work.

**2** Determine the cost of the grass seed needed for the new field. Show all of your work.

**3** Determine the cost of the water needed for the new field for the tending period. Show all of your work.

*(continued on next page)*

**New Field Costs** page 2 of 2

- 4** What is the total cost for planting the new field? Show all of your work.
- 5** Can you think of any additional costs the parents' group might need to consider?
- 6** Write down any additional information you would need to write a letter to the parents' group. The letter will tell them how much they should budget for the new field and why.

NAME \_\_\_\_\_

DATE \_\_\_\_\_



## Another New Playing Field

Ms. Li's class needs to find the cost of planting their new playing field. They gathered this information about their model field:

Field Measurements			
Our Field (Scale 1:150)		New Field	
<b>Dimensions:</b>	30" by 15"	<b>Dimensions:</b>	
<b>Area:</b>	450 square inches	<b>Area:</b>	
<b>Mass of Soil:</b>	5,400 g	<b>Mass of Soil:</b>	
<b>Water used for 2 weeks:</b>	6 gallons	<b>Water used for 2 weeks:</b>	

They gathered the following information about the cost of the soil and grass seed:

- soil – \$3.00 per 100 kilograms
- grass seed – \$1.00 per 1000 square yards
- water – 1 cent per gallon

- 1 How much will the soil for the new field cost? Show your work.
- 2 Determine the cost of the grass seed needed for the new field.
- 3 How much will the water cost that they'll use to water the field for 2 weeks?
- 4 What is the total cost for planting the new field?

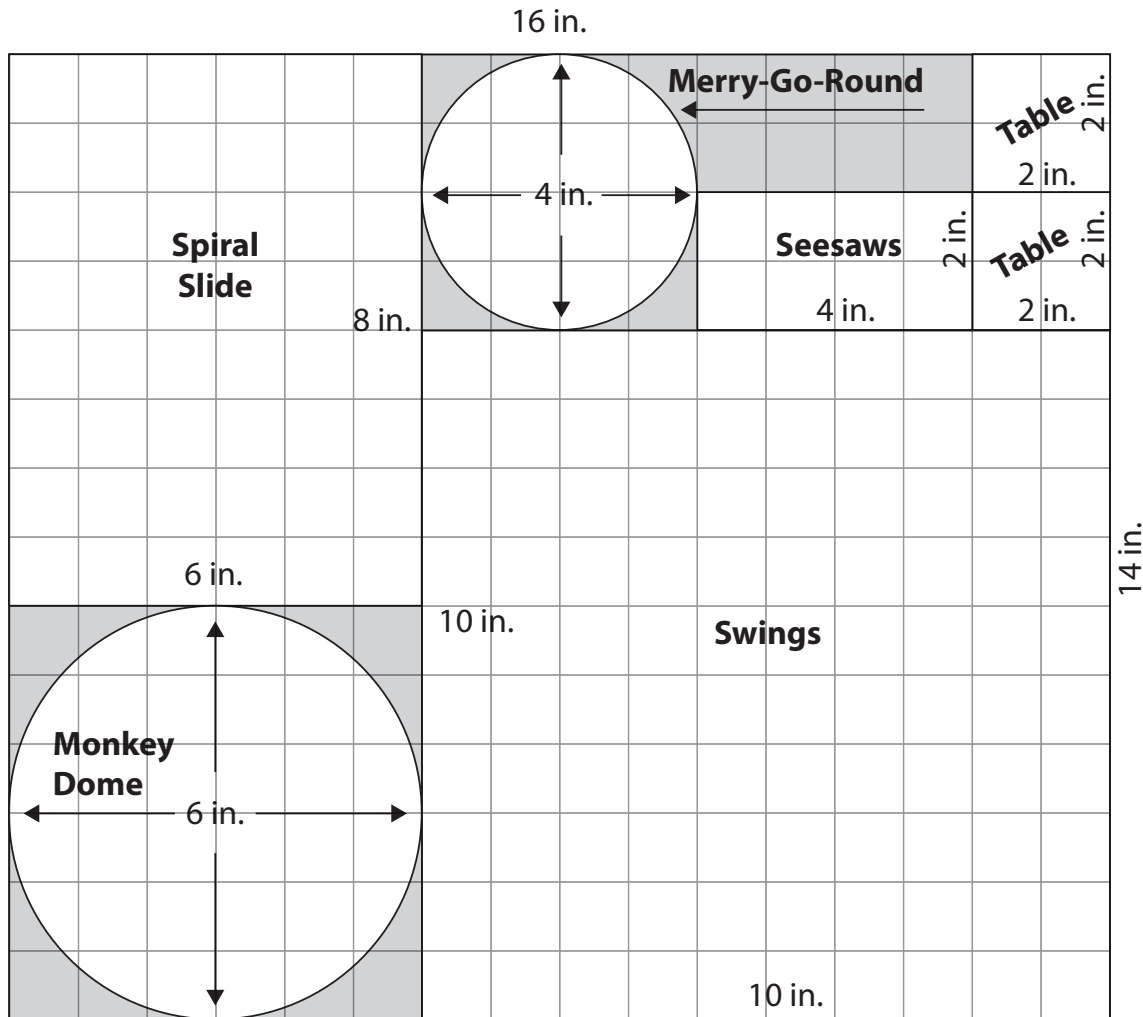
NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Playground Model

- 1** One team in Ms. Li’s class drew the following playground map to scale. Find the dimensions of the three-dimensional models they should make if the scale factor is 1 inch to 2 feet.



Item	Length	Width	
Spiral Slide			
Merry-Go-Round			
Table			
Seesaws			
Monkey Dome			
Swings			

- 2 CHALLENGE** How tall do you think the models of these items should be? Add some heights to the empty column in the table above.

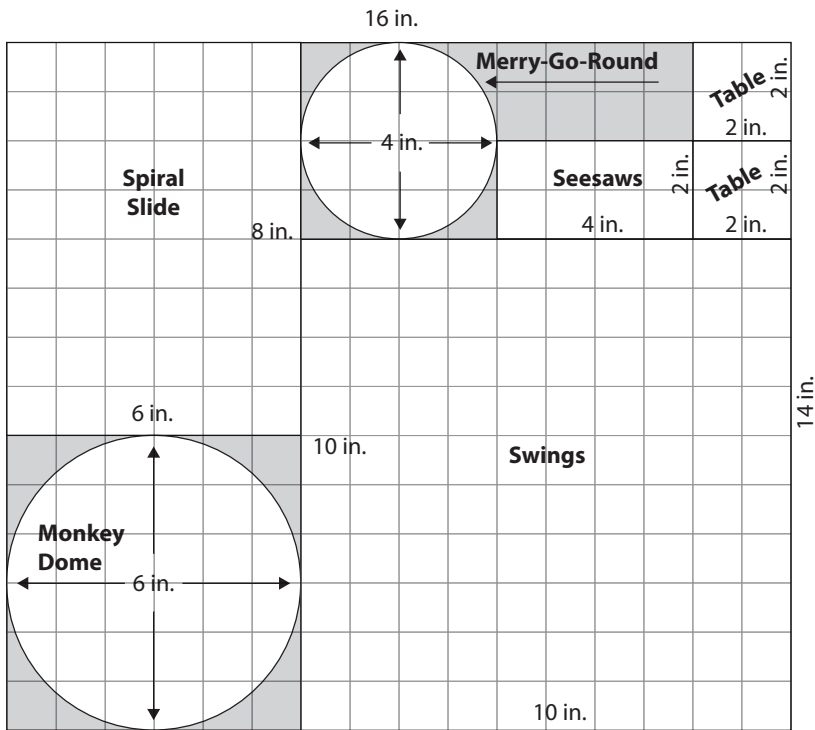
NAME \_\_\_\_\_

DATE \_\_\_\_\_



# Side-View Drawing

- 1 Draw a side view of the playground that the team in Ms. Li’s class made into 3-D models. Use the bird’s-eye view map below to help you draw the side view.





NAME \_\_\_\_\_

DATE \_\_\_\_\_



## How Much Time Do They Need?

Ms. Li's class has 1 hour and 10 minutes to work on their playground models.

- They need 5 minutes to gather materials.
- It will take them twice as long to clean up.
- They want to spend half the time building their models.
- They need the remaining time to draw a picture of the models.

**1** How many minutes can Ms. Li's students spend on each task? Show your work below.