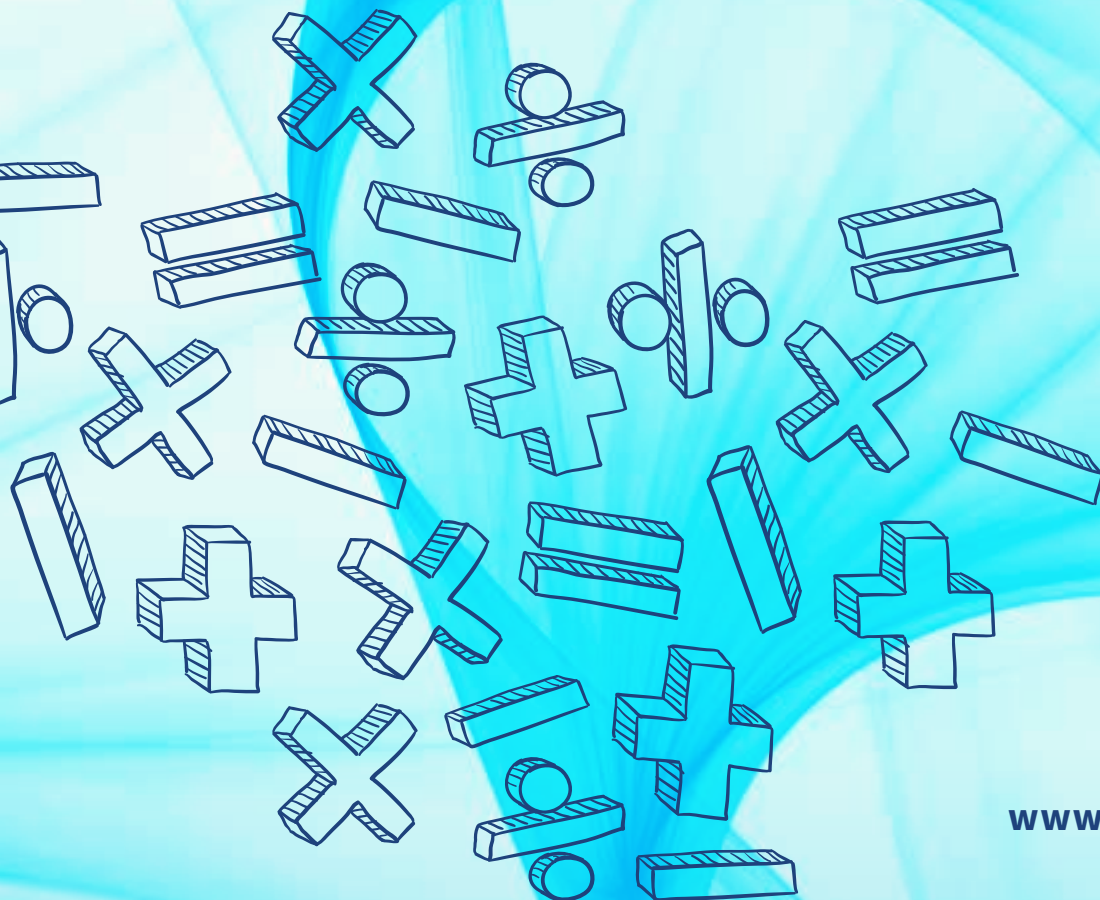# MULTIPLICATION
MODELS AND STRATEGIES

Discover the wonder of mathematics in our everyday world with STEMscopes Math. Built from the ground up by practicing educators using the flexible 5E lesson model, STEMscopes Math provides you with everything you need to create a meaningful learning experience.

LEARNING WITHIN A REAL-WORLD, RELEVANT CONTEXT

Student learning is rooted in real-world scenarios. Real-world connection provides teachers a way to foster an understanding and appreciation for numbers by focusing on the relationship between mathematical concepts and students' experiences and interests. When real-world connection is incorporated into lessons, students can see how math fits into their daily lives.

STEMscopes Math uses the Hook, Explore Activities, and Problem-Based Tasks to engage students in real-world situations where math skill is needed. Life Connections, Career Connections, Math Today! News, and Math Story incorporate math into the everyday experiences and careers that students may encounter outside of the classroom.

DESIGNED FOR NEW AND VETERAN TEACHERS

Every STEMscopes Math lesson is built to the standards, from the ground up. Chunking information into bite-size pieces, we make our units (called "scopes") digestible and engaging. Whether you're a new or veteran teacher, STEMscopes Math provides everything you need to create a meaningful learning experience.

CONCRETE-REPRESENTATIONAL-ABSTRACT (CRA) APPROACH

The CRA model is a powerful strategy for teaching new math concepts. It is a three-part constructivist process that transitions students from hands-on learning to the math we use as adults. As students progress through the Explore Activities (Lessons), they will transition from hands-on experiences with concrete objects to representational, pictorial models and ultimately arrive at symbolic representations, using only numbers, notations, and mathematical symbols.

Since state assessments often require students to solve problems at all three levels, the CRA model helps students succeed in high-stakes testing. Research-based studies show that students who use concrete materials to learn math develop more precise and comprehensive mental representations, show more motivation and on-task behavior, understand mathematical ideas, and better apply these ideas to life situations.

CONCRETE   ABSTRACT

$2+4=6$

GOAL

REPRESENTATIONAL

PROMOTING EQUITY

Implementing STEMscopes Math in the classroom provides every student access to high-quality, challenging learning opportunities. The activities within the program are scaffolded and differentiated so that all students find the content accessible, relatable, and challenging. The emphasis on collaborative learning and intentional discourse within the STEMscopes program promotes a sense of community in the classroom where students can learn from each other.

DIGITAL, PRINT, AND KITS

We are committed to delivering flexible, differentiated, student-centered instructional content through our digital platform, and we're all about making life easier for teachers.

DIGITAL CURRICULUM

Our **digital platform** allows you to assign work directly to student accounts, push content to Google Classroom, print materials on demand, and use our lessons in a whole-group or blended learning setting. Find coherent, 5E-based lessons that align with standards and seamlessly flow from one activity to the next.
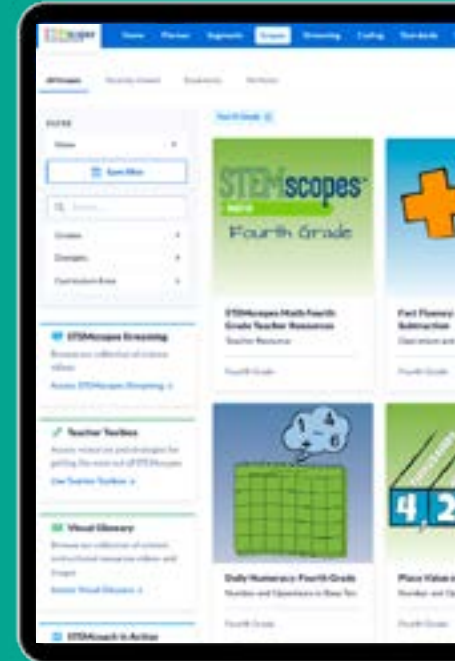
Print and hands-on kits bring digital learning and real-world instruction together. These supplemental resources establish a concrete connection between school and home, helping teachers make education more equitable.

STUDENT PRINT

HANDS-ON KITS

STANDARDS

Aligning our math program to standards is at the core of what we do. STEMscopes Math fully supports your state standards, no matter where you are.

HOME

This is where you will find your lesson planning materials so you can facilitate fun, purposeful experiences for your students. Build your content knowledge, review the scope's standards, and access parent materials in the Home section.

ENGAGE

The Engage section lays the foundation for learning. You begin by pre-assessing students and filling knowledge gaps. The Hook lays out a storyline narrative to establish a purpose for learning and capture students' attention with real-world connections.

EXPLORE*

This is where students dig into the content. The Explore section includes scaffolded hands-on activities that build toward mastery of the standards. Each Explore prompt encourages rich mathematical discourse and student reasoning, and concludes with an Exit Ticket.

EXPLAIN*

Paired with Explore, the Explain section offers a variety of resources that connect the experiences of the Explore activities to the academic content students need to know. These resources include illustrated vocabulary cards, independent practice, and journal prompts that support the Explore activities and solidify student learning.

ELABORATE*

Workstations are a go! The Elaborate section makes differentiation a cinch with ready-made activities—digital and paper-based games, spiraled review, career connections, literacy connections, and more—perfect for rotations! Students continue learning while you make time for small group interventions and independent projects to support your struggling and advanced learners.

*Instructional elements in STEMscopes Mathematics are intended to work together. The elements in the Explain and Elaborate sections can be used to support student learning and provide opportunities for practice while students explore the concept.

EVALUATE

Get the data you need from the assessment tools provided in the Evaluate section. From multiple choice-based assessments to an open-ended reasoning prompt, there's an evaluation for every student's learning style. You can also create your own assessments using the assessment builder tool.

INTERVENTION

Useful during Elaborate or as an after-school support, Intervention is a small hands-on activity designed to target students' conceptual misunderstanding while building their math skills. This is also a great re-teach and test prep tool!

ACCELERATION

Are your students ready to go above and beyond with what they've learned? In the Acceleration section, students complete a design challenge and relate learning to current events around the world. The activities prompt them to think more deeply about the content and its applications.

Fourth Grade
SAMPLE LESSON

SCOPE (UNIT)   **Multiplication Models and Strategies**
EXPLORE (LESSON)   **Multiply Four-Digit by One-Digit Numbers: Arrays**

The following pages introduce resources to help you get the most out of your STEMscopes Math Grade 4 lesson. You will also notice we've provided supportive unit resources that would allow you to plan lessons throughout the year using STEMscopes Math.

This sample lesson **does not include** all the elements and features of our digital and print math curriculum.

RESOURCE LIST

The following resources, as well as additional resources not listed, can be found in the digital curriculum *Grade 4 Scope, Multiplication Models and Strategies.*

HOME

- Student Expectations
- Key Concepts
- Scope Overview
- Parent Letter

TEACHER TOOLBOX

- Scope List
- Scope and Sequence
- Lesson Planning Guide for 1-3 Explores
- Lesson Planning Guide for 3-5 Explores

EXPLORE

- Explore 1: Multiply Four-Digit by One-Digit Numbers: Arrays*

ELABORATE

- "Mark the Spot" Fluency Builder*

EXPLAIN

- Vocabulary Cards*

DAILY NUMERACY

- "Not Like the Others" Activity*

FACT FLUENCY

- "Fours" Mini-Lesson*

These activities are samples and do not represent all the activities and resources within our digital and print curriculum.

Fourth Grade SAMPLE LESSON

STUDENT EXPECTATIONS

Use place value understanding and properties of operations to perform multi-digit arithmetic.

- Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

KEY CONCEPTS

- I can use what I know about place value and properties of operations to multiply a four-digit whole number by a one-digit whole number or to multiply two two-digit numbers.

- I can accurately and efficiently make use of a variety of strategies when multiplying whole numbers.

- I can use words and diagrams to explain my thinking about calculations involving the multiplication of whole numbers.

Scope Overview: Multiplication Models and Strategies

Standards

Use place value understanding and properties of operations to perform multi-digit arithmetic.

- Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Home

- Scope Overview
- Content Support
- Standards Unwrapped

Engage

- Accessing Prior Knowledge: Multiplication Models and Strategies
- Foundation Builder: Properties of Operations
- Hook: Spot the Talent

If the APK reveals that students are not ready, move to the Foundation Builder!

Explore

- Explore 1: Multiply Four-Digit by One-Digit Numbers: Arrays
  - Exit Ticket
- Show What You Know: Part I
- Explore 2: Multiply Four-Digit by One-Digit Numbers: Area Models
  - Exit Ticket
- Show What You Know: Part II
- Explore 3: Arrays
  - Exit Ticket
- Show What You Know: Part III
- Explore 4: Area Models
  - Exit Ticket
- Show What You Know: Part IV
- Explore 5: Area Models and Partial Products
  - Exit Ticket
- Show What You Know: Part IV

Explain

- Picture Vocabulary
- Show What You Know
- My Math Thoughts
- Anchor Chart
- Interactive Notebook

Elaborate

- Fluency Builder
  - Mark the Spot
  - Products 1, 2, 3
  - Risky Wagers
- Spiraled Review
  - J & J Mowing Company
- Math Story: The Survey Says...
- Problem-Based Task: Summer Vacation
- Interactive Practice: Warehouse Mayhem
- Career Connections: Chip and Joanna Gaines
- PhET - Area Model Multiplication

Evaluate

- Decide and Defend: The Firework Show
- Multiple Choice Assessment
- Skills Quiz

Once all of the Explores have been taught, go back to the Hook for students to apply knowledge learned.

Intervention

- Small-Group Intervention
- Checkup

Acceleration

- Math Today: Making Music
- Create Your Own: Play

Instructional elements in STEMscopes Mathematics are intended to work together. The elements in the Explain and Elaborate sections can be used to support student learning and provide opportunities to practice while the students are exploring the concept.

Fourth Grade – Multiplication Models and Strategies

Dear Parents,

Your child is about to begin exploring multiplication models and strategies. To master this skill, your child will build on his or her knowledge of multiplication from third grade. In third grade, your child learned the relationship between addition and multiplication and the properties of operations. As your child extends his or her knowledge of this concept throughout fourth grade, he or she will learn the following concepts:
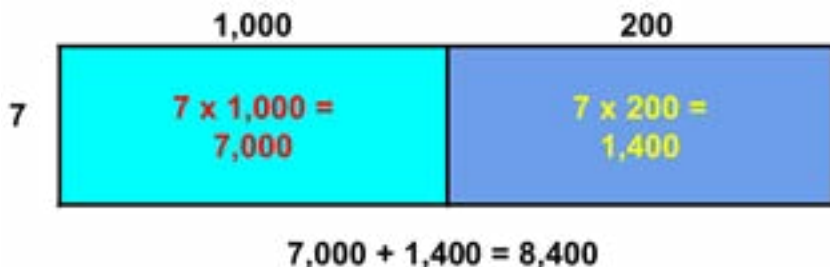
- Extend knowledge of multiplication to include numbers greater than 100.
  - Area Model/Partial Products
    Example: What is the product of 14 × 14?
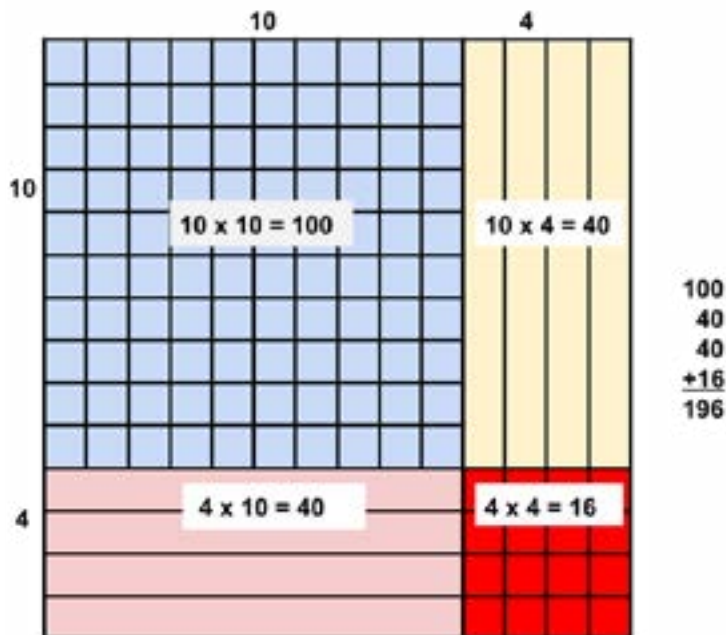
  - Rectangular Array
    Example: Joseph has seven boxes of paper. Each box contains 1,200 sheets of paper. How many sheets of paper does Joseph have in all seven boxes?

While working with your child at home, the following vocabulary terms might be helpful in your communication about multiplication models and strategies. These are terms your child will be encouraged to use throughout our explorations and during our math chats, which are short, whole-group discussions at the conclusion of each activity.

- **Terms to Know**
    - **area model:** a model where the length and width represent the factors and are configured through the operation of multiplication
    - **array:** objects or numbers that are arranged into rows or columns
    - **associative property of multiplication:** when multiplying three numbers, the placement of the grouping symbols does not affect the product, $(a \times b) \times c = a \times (b \times c)$
    - **commutative property of multiplication:** when multiplying two numbers, the order of the factors does not affect the product, $a \times b = b \times a$
    - **decompose:** to separate into parts or elements (e.g., geometric figures or numbers)
    - **distributive property of multiplication**: multiplying the sum of two or more addends by a number will give the same result as multiplying each addend individually by the number and then adding the products together
    - **equation:** a mathematical sentence that uses numbers, one or more operation symbols, and an equal sign
    - **factor:** a number multiplied with another number to get a product; goes evenly into another number
    - **multiplication:** a mathematical operation consisting of repeated addition (through various strategies) to obtain the product (answer)
    - **place value:** the numerical value that a digit has based on its position within a number
    - **product:** the answer to a multiplication problem
    - **properties of operations:** attributes or characteristics of mathematical processes
    - **strategy:** a plan of action to find a solution
    - **sum:** the answer to an addition problem

We will do many explorations in class to help your child learn these concepts from firsthand experiences. Encourage your child to share these experiences with you and to teach you what he or she has learned. Ask your child to identify examples of what he or she is learning in everyday life, such as finding the total number of soda cans in multiple cartons of soda.

Thank you for your support as your child begins this new learning adventure.

Sincerely,

Tic-Tac-Toe: Try This at Home

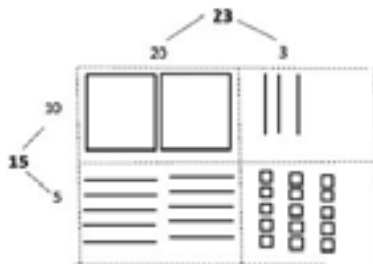|		
Important Array Terms Arrays show multiplication and their partial products. Know the following terms: **Flat:** equals 100 made from 10 × 10 square with 100 sections (On paper, draw just a square.) **Rod:** equals 10 made from a row of 10 cubes (On paper, just draw a thick line.) **Cube:** equals 1 unit in the shape of a cube (On paper, just draw a tiny square.) Now you try. →	**Make an Array for 23 × 15** Make a quadrant. Decompose both factors. Write the numbers along the top and left sides of the quadrant. **Example:** Look below. Write the decomposed factors for 23 and 15. _____ _____	**More Info on 23 × 15** Multiply 20 times each of the numbers on the left side and draw the symbols. 20 × 10 = **200** (2 squares) 20 × 5 = **100** (10 rods or 1 square—your choice!). Next, multiply 3 times both numbers on the left side: 3 × 10 = **30** or 3 rods; 3 × 5 = 15 or **15** cubes. Lastly, add the partial products to find the final product. **200 + 100 + 30 + 15 = _____**
Area Model for 28 × 39 Decompose each factor and write them on the top and left sides. Write each partial product equation inside each quadrant. Add the partial products. What is the partial product equation for 30 × 9? _____	**Free Space**	**Partial Products** Write partial products on their own line. Finish 57 × 42. (Hint: Add your partial products.)
Area Model Cookies Anna baked 13 trays with 18 cookies on each tray. Use an area model to find out how many she baked. Show your work. **13 × 18 = _____ cookies**	**Area Model Equations** Find the total area for 8721 × 6. **(Hint**: Decompose the 4-digit factor.) **8721 × 6 = _____**	**Use Partial Products Lines** Multiply 39 × 26. (Hint: Cross out old regrouped numbers to make room for new ones.)
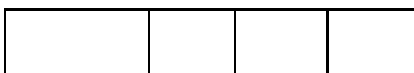
Fourth Grade Scope List

Scope Name	Explores	Suggested Pacing
Place Value of Whole Numbers	3 Explores	1-2 Weeks
Rounding	2 Explores	1 Week
Addition and Subtraction Algorithms	3 Explores	1-2 Weeks
Represent and Compare Decimals	3 Explores	1-2 Weeks
Compose and Decompose Fractions and Mixed Numbers	2 Explores	1 Week
Compare Fractions	3 Explores	1-2 Weeks
Equivalent Fractions	4 Explores	1 Week
Add and Subtract Fractions and Mixed Numbers	4 Explores	1-2 Weeks
Multiply Fractions by Whole Numbers	2 Explores	1-2 Weeks
Problem Solve With Measurement	5 Explores	1-2 Weeks
Represent Measurement with Line Plots	2 Explores	1 Week
Multiplation Models and Strategies	5 Explores	2 Weeks
Division Models and Strategies	4 Explores	2 Weeks
Prime and Composite Numbers	3 Explores	1 Week
Multiplicative Comparisons in Multiplication and Division	3 Explores	1 Week
Problem Solve Using the Four Operations	4 Explores	1-2 Weeks
Area and Perimeter Problem Solving	3 Explores	1 Week
Points, Lines, and Angles	3 Explores	1 Week
Angles	4 Explores	1-2 Weeks
Properties of Two Dimensional Figures	3 Explores	1-2 Weeks
Generate Patterns	2 Explores	1 Week

STEMscopes Math Suggested Scope and Sequence

The STEMscopes Math program is flexible, and there are variations in implementation within the guidelines provided here. This Scope and Sequence is meant to serve as a tool for you to lean on as you find how STEMscopes Math best meets the needs of the students in your classroom.

FOURTH GRADE

Week	Scope	Clusters
1	• Establish classroom procedures. • **Pre-Assessment Benchmark**	Major
2	• Place Value of Whole Numbers	Major
3	• Rounding	Major
4	• Addition and Subtraction Algorithms	Major
5	• Represent and Compare Decimals	Major
6	• Represent and Compare Decimals	Major
7	• Compose and Decompose Fractions and Mixed Numbers	Major
8	• Compare Fractions	Major
9	• Equivalent Fractions	Major
10	• Add and Subtract Fractions and Mixed Numbers	Major
11	• Add and Subtract Fractions and Mixed Numbers	Major
12	• Multiply Fractions by Whole Numbers	Major
13	• Problem Solve with Measurement	Supporting
14	• Represent Measurement with Line Plots	Supporting
15	• Multiplication Models and Strategies	Major
16	• Multiplication Models and Strategies	Major
17	• Division Models and Strategies	Major
18	• Division Models and Strategies	Major
19	• Prime and Composite Numbers	Supporting
20	• Multiplicative Comparisons in Multiplication and Division	Major
21	• Problem Solve Using the Four Operations	Major
22	• Problem Solve Using the Four Operations • **Mid-Assessment Benchmark**	Major

Week	Scope	Clusters
23	• Area and Perimeter Problem Solving	Supporting
24	• Area and Perimeter Problem Solving	Supporting
25	• Angles	Additional
26	• Angles	Additional
27	• Points, Lines, and Angles	Additional
28	• Points, Lines, and Angles	Additional
29	• Properties of Two-Dimensional Figures	Additional
30	• Properties of Two-Dimensional Figures	Additional
31	• Generate Patterns • **Post-Assessment Benchmark**	Additional
32	• **Review Week**	Major
33	• **Review Week**	Major
34	• **STANDARDIZED TEST (Approximate)**	Major
35	Review: • Place Value of Whole Numbers • Represent and Compare Decimals • Compare Fractions • Add and Subtract Fractions and Mixed Numbers • Multiplication Models and Strategies • Division Models and Strategies • Problem Solve Using the Four Operations	Major
36	Review: • Area and Perimeter Problem Solving • Angles • Points, Lines, and Angles • Properties of Two-Dimensional Figures • Generate Patterns	Supporting/ Additional

Week	Daily Numeracy
All	Additional or repeated standards are addressed in Daily Numeracy. These activities should be rotated through daily. To see the full list of what standards are addressed in these activities, please see the Daily Numeracy: Standards by Activity section in the Daily Numeracy Teacher Toolbox.

Whole Group Plan

1–3 Explores

*Based on 90-minute class period	Day 1	Day 2	Day 3	Day 4	Day 5
Whole Group	Fact Fluency/Daily Numeracy Accessing Prior Knowledge Foundation Builder[1] Hook Begin Explores if time allows. Anchor Chart	Fact Fluency/Daily Numeracy Explores[2] Anchor Chart Exit Tickets Show What You Know (Assist and reteach as needed.)	Fact Fluency/Daily Numeracy Explores (continued) Anchor Chart Exit Tickets Show What You Know (Assist and reteach as needed.)	Fact Fluency/Daily Numeracy Hook (Post-Explore) Teacher Choice[3] All students: • Picture Vocabulary • My Math Thoughts • Career Connection Mastery Level: • Decide and Defend • Math Today • Create Your Own Meets Level: • Math Story • Problem-Based Task Approaching Level: • Interactive Practice • Skills Quiz	Fact Fluency/Daily Numeracy Small-Group Intervention (for students who need it) Fluency Builder (choose one) (for students who don't need intervention)
Assessment and Closure	Accessing prior knowledge to determine readiness Formative assessment based on APK and student performance on Explore Allow students to share what they felt successful with and what they struggled with today.	Administer the exit ticket to assess student learning after the Explore. Allow students to work on Show What You Know – Part I as independent practice after first Explores.	Administer the exit ticket to assess student learning after the final Explores. Allow students to work on Show What You Know – Part 2 as independent practice after Explore 2.	Assess how students perform based on individual assignments chosen.	Standards-Based Assessment

[1]Use as intervention if APK shows foundational gaps.
[2]Set your pace according to the number of Explores included in this scope. Use Exit Tickets as well as Show What You Knows for each Explore completed.
[3]Teachers can choose from the following elements. We have suggested activities for students, including recommended tasks for students at each skill level.

Small Group Plan

1–3 Explores

*Based on 90-minute class period	Day 1	Day 2	Day 3	Day 4	Day 5
Whole Group *20 Minutes	Daily Numeracy Accessing Prior Knowledge[1] Hook Introduce stations.	Daily Numeracy Allow students to share what they learned yesterday, and discuss what students worked on. Anchor Chart	Daily Numeracy Allow students to share what they learned yesterday, and discuss what students worked on. Anchor Chart Add Picture Vocabulary words to word wall based on terms introduced in the lessons.	Daily Numeracy Hook (Post-Explore) Review any Explore or Show What You Know problems that gave students trouble. Anchor Chart	Daily Numeracy Spiraled Review Standards-Based Assessment
Small Group Instruction *Small Group/ Stations 70 Minutes	Pull small groups of students to do: 1. The Foundation Builder (if they need previous grade level content) 2. Explores 1[2]–2	Pull students to work with you to finish Explores 1–2.	Pull students to work with you on Explores 2–3.	Pull students to do the small group intervention based on needs.	None
Stations *Options are flexible.	1. Fact Fluency 2. Interactive Practice 3. Fluency Builder 4. Career Connection 5. Spiraled Review 6. Show What You Know	1. Fact Fluency 2. Interactive Practice 3. Fluency Builder 4. My Math Thoughts 5. Spiraled Review 6. Show What You Know	1. Fact Fluency 2. Interactive Practice 3. Fluency Builder 4. Math Story 5. Spiraled Review 6. Show What You Know	Have students work in groups on the Problem-Based Task.	Have the following materials available for students who finish early: 1. Fact Fluency 2. Decide and Defend 3. Skills Quiz 4. Create Your Own 5. Math Today 6. Spiraled Review
Assessment and Closure	Accessing prior knowledge to determine readiness Formative assessment based on APK and student performance to determine who needs to be pulled to small group Allow students to share what they felt successful with and what they struggled with today.	Administer the exit tickets to assess student learning after the Explores. Allow students to work on Show What You Knows as independent practice after Explores.	Administer the exit tickets to assess student learning.	Student success with intervention can be assessed by using the Checkup. Other students can be assessed by their performance on the Problem-Based Task.	Standards-Based Assessment

[1]Use as intervention if APK shows foundational gaps.

[2]Set your pace according to the number of Explores included in this scope. Use Exit Tickets as well as Show What You Knows for each Explore completed.

STEMscopes MATH

Whole Group Plan

3–5 Explores

Week 1 *Based on 90-minute class period	Day 1	Day 2	Day 3	Day 4	Day 5
Whole Group	Fact Fluency/Daily Numeracy Accessing Prior Knowledge Foundation Builder[1] Hook (Pre-Explore)	Fact Fluency/Daily Numeracy Explores[2] Anchor Chart Exit Tickets Show What You Know (Assist and reteach as needed.)	Fact Fluency/Daily Numeracy Explores (continued) Anchor Chart Exit Tickets Show What You Know (Assist and reteach as needed.)	Fact Fluency/Daily Numeracy Explores (continued) Anchor Chart Exit Tickets Show What You Know (Assist and reteach as needed.)	Fact Fluency/Daily Numeracy Explores (continued) Anchor Chart Exit Tickets Show What You Know (Assist and reteach as needed.)
Assessment and Closure	Accessing prior knowledge to determine readiness Formative assessment based on APK and student performance on Explore Allow students to share what they felt successful with and what they struggled with today.	Administer the Exit Ticket to assess student learning after the Explore. Allow students to work on Show What You Know as independent practice after Explores.	Administer the Exit Ticket to assess student learning after the Explores. Allow students to work on Show What You Know as independent practice after Explores.	Administer the Exit Ticket to assess student learning after the Explores. Allow students to work on Show What You Know as independent practice after Explores.	Administer the Exit Ticket to assess student learning after the Explores. Allow students to work on Show What You Know as independent practice after Explores.

[1]Use as intervention if APK shows foundational gaps.
[2]Set your pace according to the number of Explores included in this scope. Use Exit Tickets as well as Show What You Knows for each Explore completed.

Whole Group Plan

3–5 Explores

Week 2 *Based on 90-minute class period	Day 6	Day 7	Day 8	Day 9	Day 10
Whole Group	Fact Fluency/Daily Numeracy Explores (continued) Anchor Chart Exit Tickets Show What You Know (Assist and reteach as needed.)	Fact Fluency/Daily Numeracy Hook (Post-Explore) Picture Vocabulary My Math Thoughts Math Today Career Connection	Fact Fluency/Daily Numeracy Math Story Problem-Based Task	Fact Fluency/Daily Numeracy Teacher Choice³ Meets Level: • Decide and Defend • Create Your Own Approaching Level: • Interactive Practice • Skills Quiz	Fact Fluency/Daily Numeracy Small-group Intervention (for students who need it) Fluency Builder (choose one.) (for students who do not need intervention)
Assessment and Closure	Accessing prior knowledge to determine readiness Formative assessment based on APK and student performance on Explore Allow students to share what they felt successful with and what they struggled with today.	Allow students to share what they felt successful with and what they struggled with today.	Assess how students perform on the Problem-Based Task.	Assess how students perform based on individual assessment chosen.	Standards-Based Assessment

³Choose from the following elements. We have suggested activities for students, including recommended tasks for students at each skill level.

STEMscopes

Small Group Plan

3–5 Explores

Week 1 *Based on 90-minute class period	Day 1	Day 2	Day 3	Day 4	Day 5
Whole Group *20 Minutes	Daily Numeracy Accessing Prior Knowledge[1] Hook (Pre-Explore) Introduce stations.	Daily Numeracy Allow students to share what they learned yesterday, and discuss what students worked on.	Daily Numeracy Allow students to share what they learned yesterday, and discuss what students worked on. Anchor Chart Add Picture Vocabulary words to word wall based on terms introduced in the lessons.	Daily Numeracy Allow students to share what they learned yesterday, and discuss what students worked on. Anchor Chart Review any Explore or Show What You Know problems that gave students trouble.	Daily Numeracy Allow students to share what they learned yesterday, and discuss what students worked on. Anchor Chart Review any Explore or Show What You Know problems that gave students trouble.
Small Group Instruction *Small Group/ Stations 70 Minutes	Pull small groups of students to the Foundation Builder (if they need previous grade-level content). Begin Explores.[2]	Pull students to work with you on Explore 1.	Pull students to work with you on Explore 2.	Pull students to work with you on Explore 3.	None
Stations	1. Fact Fluency 2. Interactive Practice 3. Fluency Builder (from previous scope)	1. Fact Fluency 2. Interactive Practice 3. Fluency Builder (from previous scope)	1. Fact Fluency 2. Interactive Practice 3. Fluency Builder (from previous scope)	1. Fact Fluency 2. Interactive Practice 3. Fluency Builder (from previous scope)	1. Fact Fluency 2. Decide and Defend 3. Skills Quiz
Assessment and Closure	Accessing prior knowledge to determine readiness Formative assessment based on APK and student performance to determine who needs to be pulled to small group Allow students to share what they felt successful with and what they struggled with today.	Administer the Exit Ticket to assess student learning after the Explores. Allow students to work on Show What You Knows as independent practice after Explores.	Administer the Exit Ticket to assess student learning after the Explores. Allow students to work on Show What You Knows as independent practice after Explores.	Administer the Exit Ticket to assess student learning after the Explores. Allow students to work on Show What You Knows as independent practice after Explores.	Administer the Exit Ticket to assess student learning after the Explores. Allow students to work on Show What You Knows as independent practice after Explores. Decide and Defend Skills Quiz

[1]Use as intervention if APK shows foundational gaps.
[2]Set your pace according to the number of Explores included in this scope. Use Exit Tickets as well as Show What You Knows for each Explore completed.

STEMscopes MATH

Small Group Plan

3–5 Explores

Week 2 *Based on 90-minute class period	Day 6	Day 7	Day 8	Day 9	Day 10
Whole Group *20 Minutes	Daily Numeracy Allow students to share what they learned yesterday, and discuss what students worked on. Anchor Chart Review any Explore or Show What You Know problems that gave students trouble.	Daily Numeracy Allow students to share what they learned yesterday, and discuss what students worked on. Anchor Chart Review any Explore or Show What You Know problems that gave students trouble.	Daily Numeracy Allow students to share what they learned yesterday, and discuss what students worked on. Add Picture Vocabulary words to word wall based on terms introduced in the lessons.	Daily Numeracy Allow students to share what they learned yesterday, and discuss what students worked on. Review any Explore or Show What You Know problems that gave students trouble.	Daily Numeracy Spiraled Review Standards-Based Assessment
Small Group Instruction *Small Group/ Stations 70 Minutes	Pull students to work with you on Explore 4.	Pull students to work with you on Explore 5.	Hook (Post-Explore)	Small-Group Intervention	None
Stations	1. Career Connection 2. Spiraled Review 3. Show What You Know	1. My Math Thoughts 2. Spiraled Review 3. Show What You Know	1. Math Story 2. Spiraled Review 3. Show What You Know	Have students work in groups on the Problem-Based Task.	Have the following materials available for students who finish early: 1. Create Your Own 2. Math Today 3. Spiraled Review
Assessment and Closure	Accessing prior knowledge to determine readiness Allow students to share what they felt successful with and what they struggled with today.	Administer the Exit Tickets to assess student learning after the Explores. Allow students to work on Show What You Knows as independent practice after Explores.	Administer the Exit Tickets to assess student learning.	Student success with intervention can be assessed by using the Checkup. Other students can be assessed by their performance on the Problem-Based Task.	Standards-Based Assessment

¹Use as intervention if APK shows foundational gaps.
²Set your pace according to the number of Explores included in this scope. Use Exit Tickets as well as Show What You Knows for each Explore completed.

Multiplication Models and Strategies SAMPLE

Explore 1 - Multiply Four-Digit by One-Digit Numbers: Arrays

Description

In this Explore, students will represent multiplication of numbers up to four digits by a one-digit number, using multiples of 10 and arrays.

Standards for Mathematical Practice

- **MP.2 Reason abstractly and quantitatively:** As problems are worked, students will use various representations and approaches to solve, making connections between the multiplication and the representations. They are able to explain their reasoning using place value language or how they applied one of the properties of operations.

- **MP.3 Construct viable arguments and critique the reasoning of others:** Students are able to analyze a multiplication problem and make conjectures as to how to solve. They clearly and precisely justify their solution by providing evidence through visual representation or equations. Counterexamples may be given when analyzing the reasoning of others.

- **MP.4 Model with mathematics:** Students are expected to represent multiplication problems in various ways, e.g., academic language, equations, drawings, and models. They should be able to explain and assess their solutions within the context of the problem given and determine if the solution is reasonable. They gain the ability to apply multiplication to everyday life.

- **MP.5 Use appropriate tools strategically:** After analyzing the problem, students will choose the most appropriate tool available to solve. The efficiency of a tool as well as its effectiveness is developed so students can visualize and represent the problem as they deepen their understanding of multiplication.

- **MP.7 Look for and make use of structure:** Students look for structure within the multiplication problem. In order to solve, they may choose to decompose numbers using place value to explain their calculations. They may look for patterns and associate the patterns with the properties of operations to visualize and explain their solutions.

Materials

Printed
1 Student Journal (per student)

1 Set of Station Cards (per class)

1 Set of Place Value Cards (per group)

1 Exit Ticket (per student)

Reusable
1 Set of base ten blocks (per group)

Consumable
1 Resealable bag (per group)

Preparation

- Print a copy of the Student Journal and Exit Ticket for each student.
- Print the Station Cards and Place Value Cards on card stock. Laminate if desired.
- Cut out the Station Cards and Place Value Cards. Put each set of Place Value Cards into resealable bags.
- Each group will need a set of base ten blocks, for Part I, and a set of Place Value Cards, for both parts of the activity.

- Put students into six groups and set up the Station Cards around the room.
- For students who need more support in recalling information, please see our Grid Paper and Base Tens Supplemental Aids elements in the Intervention section.
- **Go Digital!** Have students explore or present their solutions using virtual manipulatives! The manipulatives used in this lesson can be found in the Explore drop-down menu and can be digitally assigned to students.

Procedure and Facilitation Points

Part I

1. Give each group a set of base ten blocks and Place Value Cards.
2. Read the following scenario.

   You are employees at Cra-Z-Crafts, a local craft store. You are going to help with the quarterly inventory. They need your help to figure out how many craft supplies they have in the store. We will start by finding out how much paper they have. There are 3 boxes of paper, and each box contains 123 reams of paper.

3. Encourage students to use the base ten blocks to show how they could figure out the product of 123 and 3. Support students by asking them to think of the problem as "groups of."

   a. Students will show this in various ways such as groups and arrays.

   b. **DOK-1** What would be a good estimate of our product? Encourage students to think about their multiples of 10 and 100. 120 × 3, 100 × 3 = 300, or 12 × 3 = 36 so 120 × 3 = 360. The answer should be around 300 to 360.

   c. Invite a student who used an array to talk through how he or she modeled the problem. Or tell students that you once saw a student use an array and model it for them. Instruct students to convert their model into an array, if they did not already do so. Make 3 equal rows of 123. Be sure to line up the rods and units to make a rectangular array.

   d. Invite a student to draw the model on the board. Explain that the tens (rods) can be drawn as a straight line and the ones (units) can be drawn as dots to save time.

4. Discuss the following.

   a. **DOK-1** How many are in each row? One hundred twenty-three

   b. **DOK-1** How many rows are there? Three

   c. **DOK-1** So how many hundreds do we have in all? Explain how you know. Ten tens makes a hundred. Each row has one group of ten tens, and there are three rows. Three groups of 100 makes 300.

    d. **DOK-1** How could we write this as an equation to show the value of these hundreds? 100 × 3 = 300.

    e. **DOK-1** How many groups of tens do we have now? Three groups of two tens.

    f. **DOK1** How could we write this as an equation to show the value of these tens? 20 × 3 = 60.

    g. **DOK-1** How many ones are in each row? Three

    h. **DOK-1** How many rows are there? Three

    i. **DOK-1** So how many groups of ones do we have? Three groups of three ones.

    j. **DOK-1** How could we write this as an equation to show the value of these ones? 3 × 3 = 9

    k. **DOK-1** How could we find the total product? We could add the products from the equations. We could add 300 + 60 + 9, which equals 369.

    l. **DOK-1** Was this around our estimation? Yes, because our product is 369, which is close to 360.

5. Read the following scenario.

   Now we will find out how many pencils they have. Pencils come in boxes of 2,305 and we have 4 boxes.

6. Allow students to try using the base ten blocks to solve. They should have a problem with this. There are not enough blocks, and it would take a very long time. Introduce the place value cards and show the students how the cards can be used to represent a number in a row without having to line up a lot of tens.

7. When students are done building, ask the following questions.

    a. **DOK-1** How many thousands are in each group? 2

    b. **DOK-1** How many groups of 2,000 do we have? 4

    c. **DOK-1** What equation could we write for 4 groups of 2,000? 4 × 2000

    d. **DOK-1** How many hundreds are in each group? 3

    e. **DOK-1** How many groups of 300 do we have? 4

    f. **DOK-1** What equation could we write for 4 groups of 300? 4 × 300.

    g. **DOK-1** How many tens are in each group? 0

    h. **DOK-1** How many ones are in each group? 5

    i. **DOK-1** How many groups of 5 do we have? 4

    j. **DOK-1** What equation could we write for 4 groups of 5? 4 × 5

    k. **DOK-1** How do we find the total amount? Add all of the products from each group.

Part II

1. Distribute a Student Journal to each student. Assign each group to start at a different station.

2. Students will read their Station Card. They will build a model of the problem and record their work on their Student Journal. They will record how many groups of each place value card they have and make a corresponding equation. They will also record a solution sentence that explains what they found.

   a. Students can use lines and label the length in order to efficiently draw the array they built.

3. Give groups about 8 minutes before either rotating Station Cards or having the students physically rotate to the next station.

4. Students will repeat the previous steps until they have completed each station.

5. After the Explore, invite the class to a Math Chat to share their observations and learning.

Math Chat	
Questions	**Sample Student Responses**
DOK-2 How did what you learned in third grade prepare you to work with these larger numbers?	In third grade I learned to multiply one-digit numbers by tens. I used the same strategies to multiply one-digit numbers by hundreds and thousands.
DOK-2 How can arrays be used to multiply large numbers?	We can break the larger number apart by place value to find the total number of thousands, hundreds, tens, and ones. Then we combine those two totals.
DOK-1 How did you find the total of all the tens?	I treated it like an array to find the total number of tens, then multiplied that amount by 10. I skip counted by 10.
DOK-1 How did you find the final total?	I added the total from each place value to find the final total.

6. When students are done, have them complete the Exit Ticket to formatively assess their understanding of the concept.

Instructional Supports

1. Students may need additional guidance on how to build an array with base ten blocks. Show students how a unit cube can be placed on the end of a horizontal tens rod in order to create rows for their arrays.

2. It may benefit them to be reminded of lessons on area from third grade. Have them draw the outline of a square or rectangle using the given dimensions. Then have them use base ten blocks to build each side, focusing on one dimension at a time.

3. Students may struggle to determine the multiplication number sentence for each section of the array. If so, remind them that they are multiplying each section's two dimensions (sides) and that they could count the units to find the total area of each section.

4. Students might benefit from decomposing the array shape and placing the sections next to each other in a line with some space in between each section. Students could then write plus signs on sticky notes and place the sticky notes between the piles.

Language Acquisition Strategy

The following Language Acquisition Strategy is supported in this Explore activity. See below for ways to support a student's English language development.

Students communicate by describing and explaining with greater specificity as more English is obtained.

- During the math chats, provide students with sentence frames to answer. This can be done by "flipping the question" and using an example such as the following:
  - Question: What did you notice when you multiplied one-digit numbers by 10?
  - Answer: Every time I multiplied a one-digit number by ten, it increased the value of each digit by 10.

- As you are monitoring students as they work, ask students to describe and explain what they are doing. Have students do a Think, Pair, Share on creating an array or multiplying by 10 after the lesson to summarize and provide more opportunities to use the vocabulary.

Explore

Name: _____ Date: _____

Craft Store Inventory

Cra-Z-Crafts needs your help with their quarterly inventory. They need your help figuring out how many craft supplies they have in stock.

At each station, build an array to model the number of items. Describe your model by writing how many groups of thousands, hundreds, tens, and ones you have. Then write an equation for each group and use the products to find the total number of items.

Glue Bottles			
Model			
Write an expression for your model: _____ × _____			
Hundreds	Tens	Ones	Total
_____ groups of _____ Equation: _____ × _____ = _____	_____ groups of _____ Equation: _____ × _____ = _____	_____ groups of _____ Equation: _____ × _____ = _____	
Solution Statement:			

Explore

Paint Bottles			
Model			

Write an expression for your model: _____ × _____

Hundreds	Tens	Ones	Total
_____ groups of _____ Equation: _____ × _____ = _____	_____ groups of _____ Equation: _____ × _____ = _____	_____ groups of _____ Equation: _____ × _____ = _____	

Solution Statement:

Jars of Glitter			
Model			

Write an expression for your model: _____ × _____

Hundreds	Tens	Ones	Total
_____ groups of _____ Equation: _____ × _____ = _____	_____ groups of _____ Equation: _____ × _____ = _____	_____ groups of _____ Equation: _____ × _____ = _____	

Solution statement:

Explore

Poster Board

Model

Write an expression for your model: _____ × _____

Find the partial products for each place value and use them to find the final product:

Solution statement:

Gel Pens

Model

Write an expression for your model: _____ × _____

Solve using partial products:

Solution statement:

Explore

Scrapbook Paper
Model
Write an expression for your model: _____ × _____
Solve using partial products:
Solution statement:

Reflect

How can models be used to multiply large numbers?

_____

_____

How did you find the final total?

_____

_____

What connections did you make during this activity?

_____

_____

Explore

Station Cards

Print and cut along the dotted lines.

Glue Sticks

There are 245 glue sticks in a box. There are 4 boxes. How many glue sticks are there?

Paint Bottles

There are 3 boxes of paint bottles. Each box has 142 bottles in it. How many paint bottles are there?

Jars of Glitter

There are 2 shelves for the jars of different-colored glitter. Each shelf has 321 jars on it. How many jars of glitter are there?

Explore

Poster Board

There are 4 boxes of poster board. There are 1,342 sheets in each box. How many sheets of poster board are there?

Gel Pens

There are 6 packages of gel pens. Each package has 313 pens in it. How many gel pens are there?

Scrapbook Paper

There are 3 variety packs of scrapbook paper. Each pack has 2,035 sheets of paper in it. How many sheets of scrapbook paper are there?

Explore

Place Value Cards

Print and cut along the dotted lines.

1,000	100	100
1,000	100	100
1,000	100	100
1,000	100	100
1,000	100	100
1,000	100	100
100	100	100
100	100	100

Explore

10	10	1	1	1
10	10	1	1	1
10	10	1	1	1
10	10	1	1	1
10	10	1	1	1
10	10	1	1	1
10	10	1	1	1
10	10	1	1	1

Multiplication Models and Strategies
Explore 1

Explore

Name: _____ Date: _____

4-Digit by 1-Digit Multiplication
Exit Ticket

For each multiplication equation, draw an array to model the problem and use what you know about place value and multiplication to solve. Write equations to show your thinking.

6 × 126 = _____

3,124 × 5 = _____

1

Math Chat

Part 2

Math Chat
How did what you learned in third grade prepare you to work with these larger numbers?
How can arrays be used to multiply large numbers?
How did you find the total of all the tens?
How did you find the final total?

Math Chat

Question 1:

How did what you learned in third grade prepare you to work with these larger numbers?

Math Chat

Question 2:

How can arrays be used to multiply large numbers?

Math Chat

Question 3:

How did you find the total of all the tens?

Math Chat

Question 4:

How did you find the final total?

Multiplication Models and Strategies SAMPLE

Fluency Builder - Mark the Spot

Description

Students play this game in pairs. They match values of multiplication problems with corresponding multiplication models and word problem cards. Each time they make a match, they mark their spot on the game board with a counter. The first player to place all counters on the board wins.

Materials

Printed
1 Instruction Sheet (per pair)
1 Game Board (per pair)
1 Set of Multiplication Model Cards (per pair)
1 Student Reflection Sheet (per student)

Reusable
20 Counters, 10 of one color and 10 of another color (per pair)
1 Envelope or bag (per pair)

Preparation

- Copy a game board for each pair of students.
- Copy and cut out a set of multiplication model game cards per pair of students. It is suggested that you laminate these cards and store each set in an envelope or bag for future use.
- Copy a student reflection sheet for each student.

Procedure and Facilitation Points

1. Demonstrate a few rounds with a student.
2. Each pair shuffles the deck of cards and places them facedown in a pile.
3. Each player takes 10 counters of the same color.
4. Players take turns drawing a card. Upon drawing a card, the player finds the matching value on the game board and places a counter on top. Plays may result in the following outcomes:

   - If a player draws a card with an answer that has already been covered by the opponent, the player may get the opponent out by removing that player's counter from the game board and adding on his or her own instead. In this case, the opponent takes back his or her counter.
   - If a player draws a card with an answer that has already been covered with his or her own colored counter, he or she stacks a second counter on top of this spot, making the spot safe. When a spot is marked safe, the counter remains on the game space for the remainder of the game (it cannot get knocked out).

5. After each draw, place the cards in a separate pile (they are only used once).
6. The winner is the first to put all counters on the game board. If both players still have counters and all game cards have been drawn, the winner is the player with the most counters on the game board.
7. Students complete the student reflection sheet independently, and they share their answers with their partners.

Fluency Builder

Mark the Spot Game Board

168	572	187	225	480
300	143	336	144	180

Multiplication Models and Strategies

Fluency Builder

Mark the Spot

Play this game in pairs.

You Will Need

1 Game board (per pair)

1 Set of multiplication model cards (per pair)

1 Student reflection sheet (per student)

20 Counters, 10 of one color and 10 of another color (per pair)

How to Play

1. Shuffle the deck of cards, and place them facedown in a pile.
2. Each player takes 10 counters of the same color.
3. Take turns drawing a card. Find the matching value on the game board, and place a counter on top. Plays may result in the following outcomes:
   - If a player draws a card with an answer that has already been covered by the opponent, the player may get the opponent out by removing that player's counter from the game board and adding his or her own instead. In this case, the opponent takes back his or her counter.
   - If a player draws a card with an answer that has already been covered with his or her own colored counter, he or she stacks a second counter on top of this spot, making the spot safe. When a spot is marked safe, the counter remains on the game space for the remainder of the game (it cannot get knocked out).
4. After each draw, place the cards in a separate pile (they are only used once).
5. The winner is the first to put all his or her counters on the game board. If both players still have counters and all game cards have been drawn, the winner is the player with the most counters on the game board.
6. Complete the student reflection sheet independently, and share your reflections with your partner.

Fluency Builder

Mark the Spot: Multiplication Model Cards
(Front of Page 1)

| What is the area of a pizza box that measures 14 inches by 12 inches?	

	10	+	2
10	$10 \times 10 = 100$		$10 \times 2 = 20$
+			
4	$4 \times 10 = 40$		$4 \times 2 = 8$

How many square feet of grass cover a yard that is 22 feet by 26 feet?	

	20	+	2
20	$20 \times 20 = 400$		$20 \times 2 = 40$
+			
6	$6 \times 20 = 120$		$6 \times 2 = 12$

Multiplication Models and Strategies

Fluency Builder

Mark the Spot: Multiplication Model Cards
(Back of Page 1)

Mark the Spot	Mark the Spot
Mark the Spot	Mark the Spot

Multiplication Models and Strategies

Fluency Builder
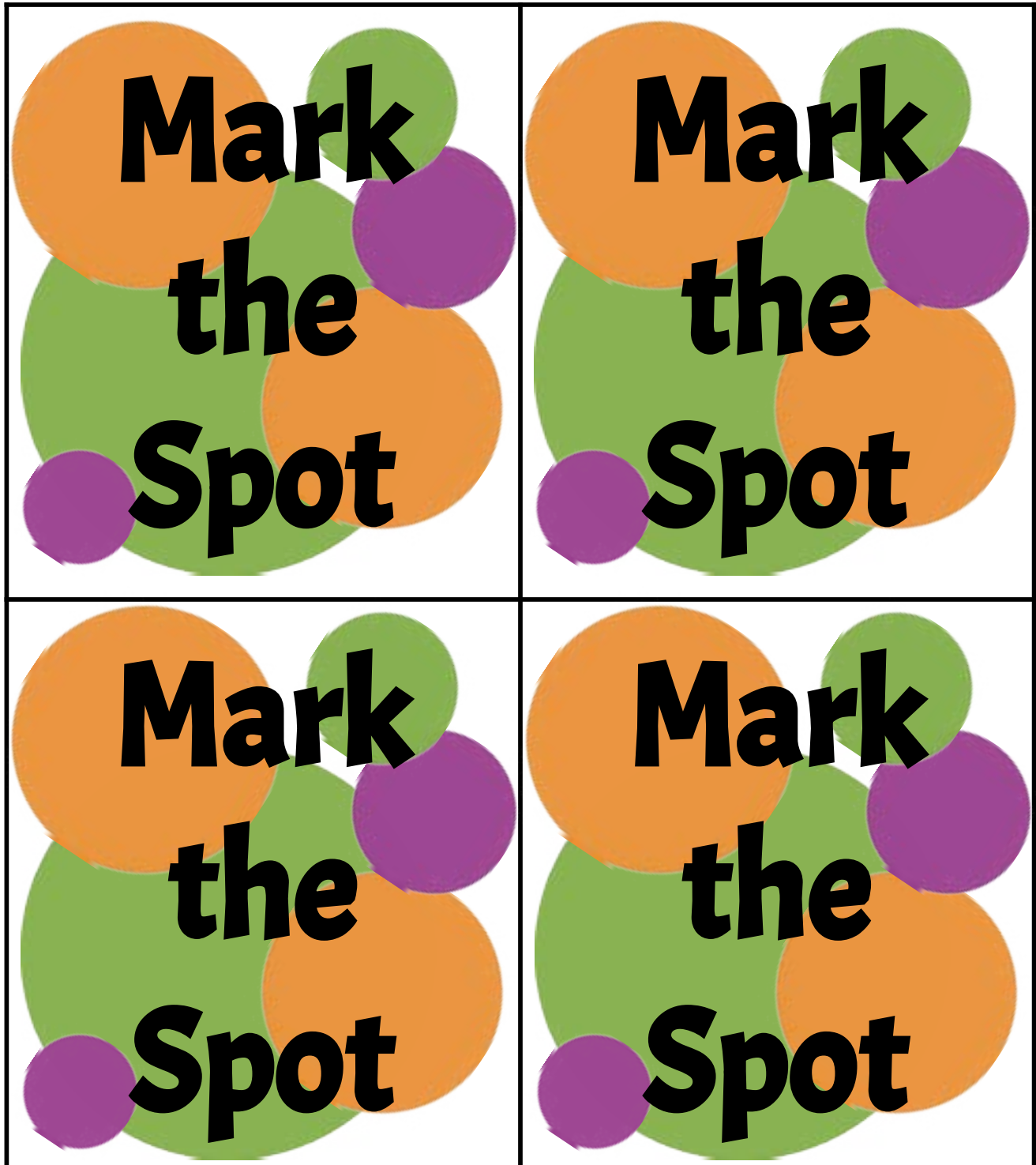
Mark the Spot: Multiplication Model Cards
(Front of Page 2)

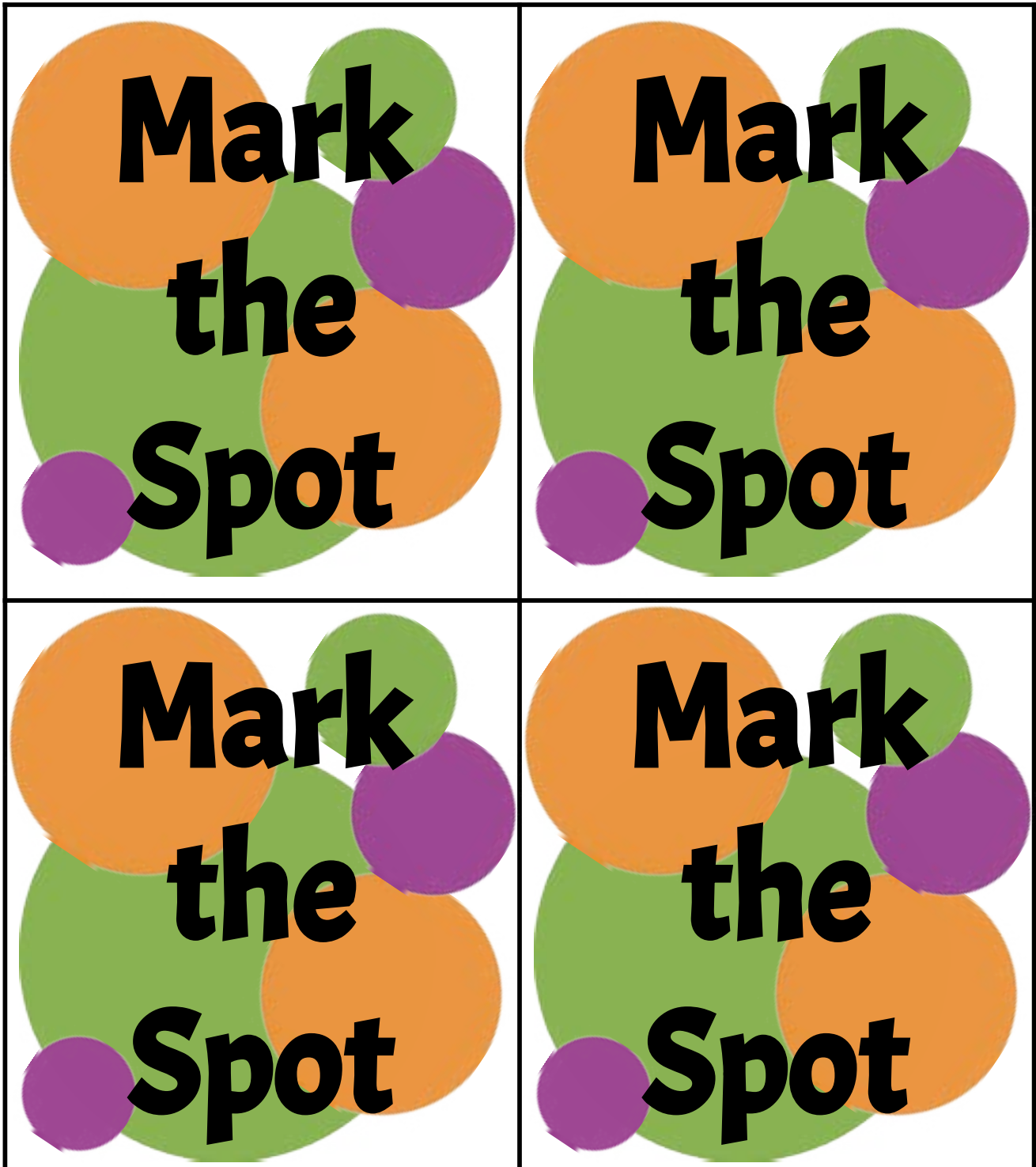|	
How many square inches of paint are needed to cover a poster board that measures 11 inches by 17 inches?		10	+	1	| 10 | 10 × 10 = 100 | 10 × 1 = 10 | + | | | 7 | 7 × 10 = 70 | 7 × 1 = 7 |
How many 1-foot square tiles can fit on a floor that is 15 feet by 15 feet?		10	+	5	| 10 | 10 × 10 = 100 | 10 × 5 = 50 | + | | | 5 | 5 × 10 = 50 | 5 × 5 = 25 |

Multiplication Models and Strategies

Fluency Builder

Mark the Spot: Multiplication Model Cards
(Back of Page 2)

Mark the Spot

Mark the Spot

Mark the Spot

Mark the Spot

Fluency Builder

Mark the Spot: Multiplication Model Cards
(Front of Page 3)

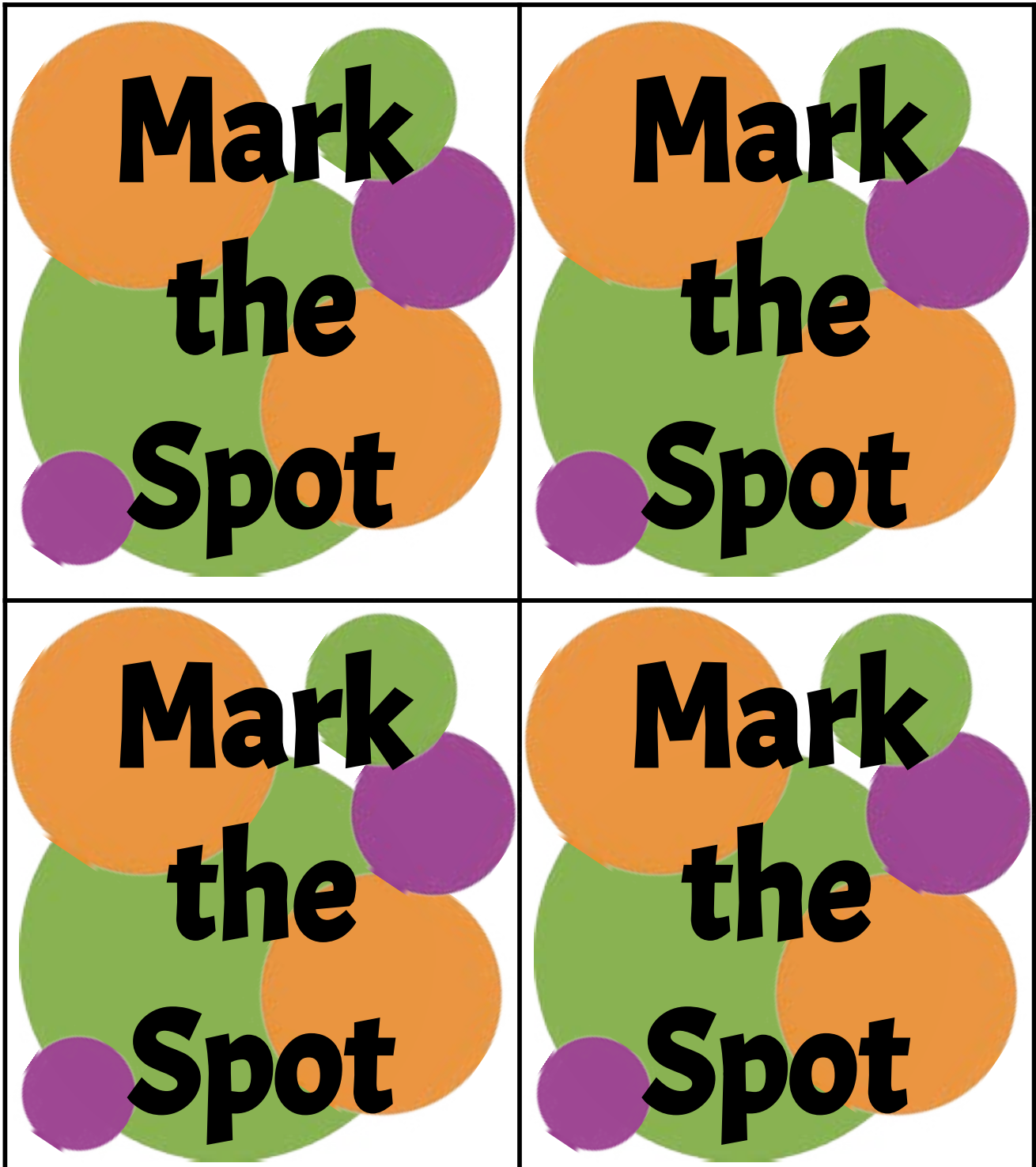|	
The school is ordering oranges for lunch. Every box contains 32 oranges. How many oranges are included in 15 boxes?	

	30	+	2
10	10 × 30 = 300		10 × 2 = 20
+			
5	5 × 30 = 150		5 × 2 = 10

Every class in the school has 25 students. How many students are in the school if there are 12 classes?	

	20	+	5
10	10 × 20 = 200		10 × 5 = 50
+			
2	2 × 20 = 40		2 × 5 = 10

Multiplication Models and Strategies

Fluency Builder

Mark the Spot: Multiplication Model Cards
(Back of Page 3)

Mark the Spot

Mark the Spot

Mark the Spot

Mark the Spot

Fluency Builder

Mark the Spot: Multiplication Model Cards
(Front of Page 4)

How many square feet of paint are needed to cover a wall that measures 11 feet by 13 feet?	

	10	+	1
10	10 × 10 = 100		10 × 1 = 10
+ 3	3 × 10 = 30		3 × 1 = 3

Every box contains 24 pencils. How many pencils are in 14 boxes?	

	20	+	4
10	10 × 20 = 200		10 × 4 = 40
+ 4	4 × 20 = 80		4 × 4 = 16

Multiplication Models and Strategies

Fluency Builder

Mark the Spot: Multiplication Model Cards
(Back of Page 4)

Mark the Spot

Mark the Spot

Mark the Spot

Mark the Spot

Fluency Builder
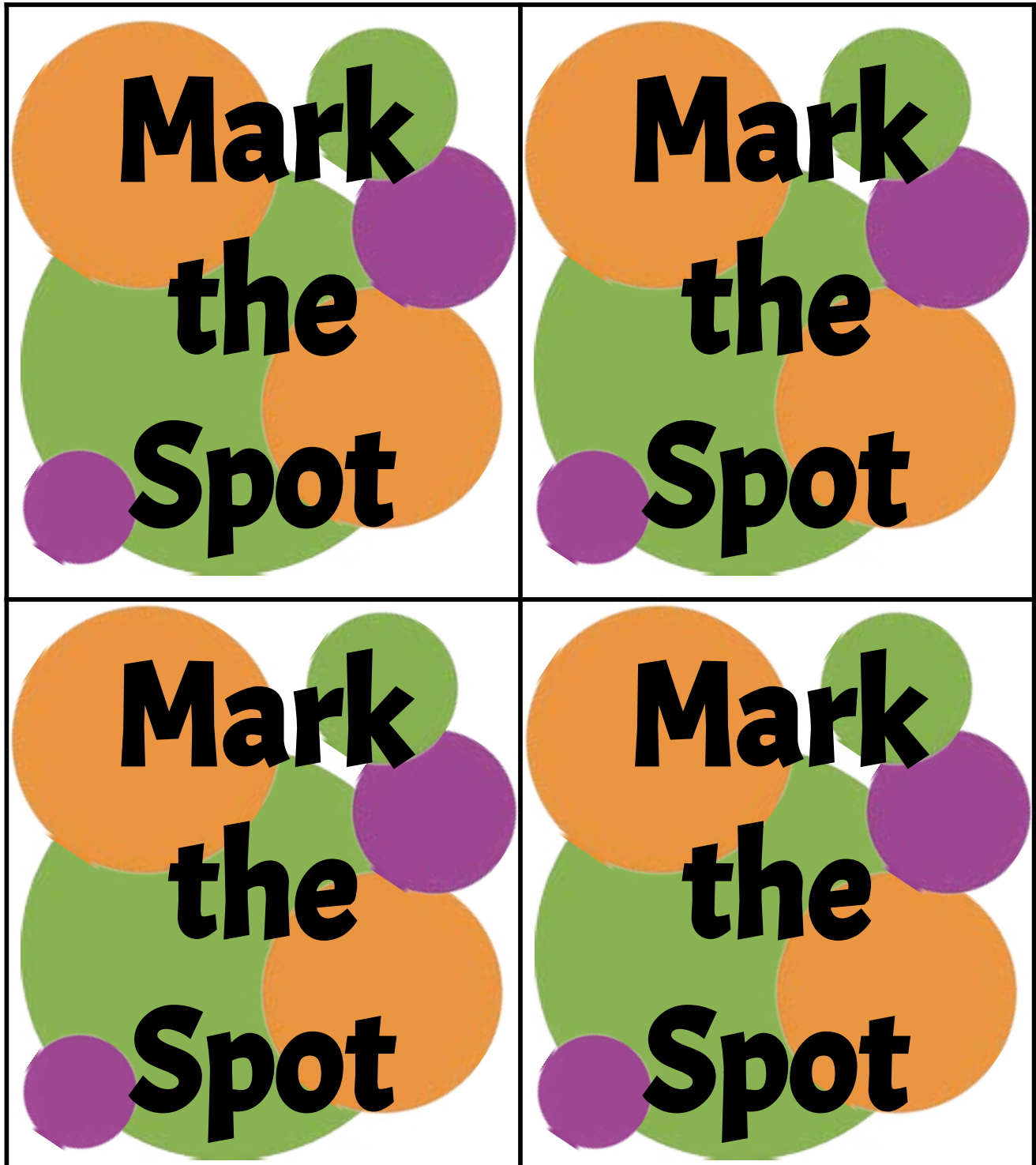
Mark the Spot: Multiplication Model Cards
(Front of Page 5)

|	
How many square inches of cloth are needed to cover a tabletop that measures 12 feet by 12 feet?	10 + 2 10: $10 \times 10 = 100$, $10 \times 2 = 20$ + 2: $2 \times 10 = 20$, $2 \times 2 = 4$
Every box contains 12 doughnuts. How many doughnuts are there in 15 boxes?	10 + 2 10: $10 \times 10 = 100$, $10 \times 2 = 20$ + 5: $5 \times 10 = 50$, $5 \times 2 = 10$

Fluency Builder

Mark the Spot: Multiplication Model Cards
(Back of Page 5)

Mark the Spot

Mark the Spot

Mark the Spot

Mark the Spot

Multiplication Models and Strategies
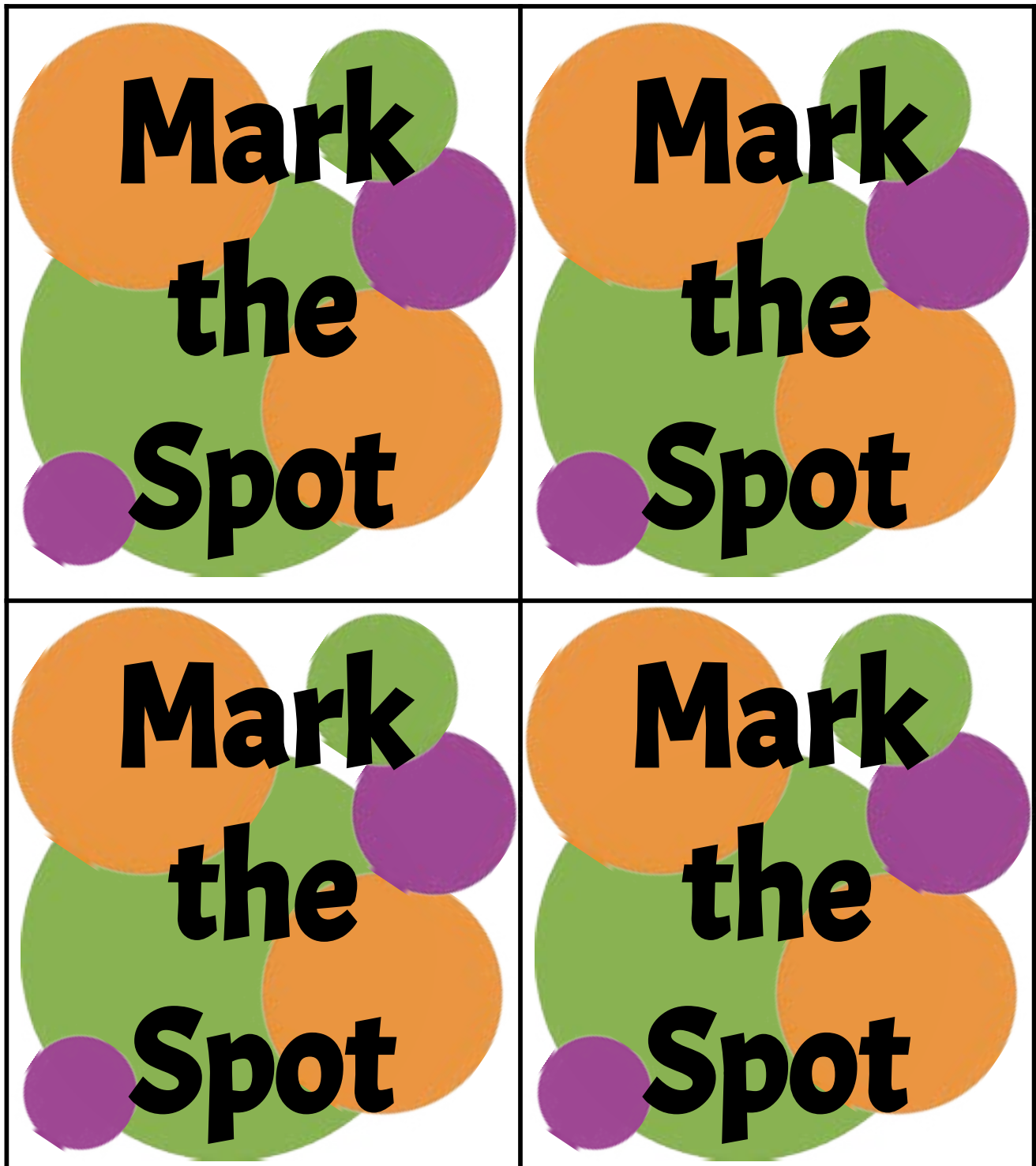
Fluency Builder

Name: _____ Date: _____

Mark the Spot Student Reflection Sheet

Choose a value from the game board. Record the matching multiplication model and equation that represent this value.

Multiplication Model	Equation

Choose another value from the game board. Record the matching multiplication word problem and equation that match this value.

Multiplication Problem	Equation

Multiplication

3 + 3 + 3 + 3

= 4 x 3

= 12

A way to create a product by making equal groups, repeating addition, or forming arrays

---

Product

3 x 7 = 21

The result of multiplying two or more numbers together

Multiplication Models and Strategies

Picture Vocabulary

Factor

3 x 7 = 21

A number that is multiplied by another number to find a product

One Digit

Hundreds	Tens	Ones
		4

A number in the ones place—0, 1, 2, 3, 4, 5, 6, 7, 8, or 9 only

Digit

0 1 2 3 4
5 6 7 8 9

Any of the numbers 0–9

Strategies

Plans of action to solve a problem

Multi-Digit

12 978
1,325

A number made up of more than one 0–9 digit

WHAT IS DAILY NUMERACY?

The goal of Daily Numeracy is to empower students to reason with numbers in an accurate, efficient, and flexible way. We have included a carefully crafted, purposeful activity sample designed to help students build their thinking and reasoning around relationships and connections. Each grade level has numerous Daily Numeracy activities.

Not Like the Others Activity

DESCRIPTION

Students describe the characteristics of an object in a set of 4 and discuss how it is different from the others.

MATERIALS

PRINTED

- 1 Slideshow (per class)

REUSABLE

- 1 Projector or document camera (per class)

PREPARATION

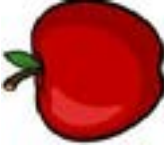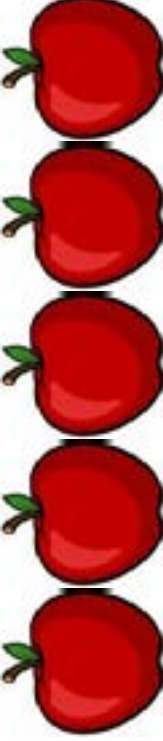- Prepare to project the Slideshow prompt of the day for the class.

PROCEDURE AND FACILITATION POINTS

1. Gather students together and project the Slideshow prompt of the day. Students should not have anything with them for this activity.

2. Give students a minute of silent think time as they look at the pictures on the prompt. Ask students relevant guiding questions:

   a. What do you notice?

   b. Which one is not like the others?

   c. What characteristic makes it different?

   d. How are these objects similar?

   e. Do you see another object that is not like the others?

3. Listen to multiple student responses. Accept any answer with accurate reasoning.

4. As students discuss which one is not like the others, ask the class if they agree or disagree. Provide the following sentence stems for their responses:

   a. I agree because …

   b. I disagree because …

   c. Can you explain why you …?

Daily Numeracy

An apple cost $2. A bag of apples cost 5 times as much.

2×5

2

2	2	2	2	2

WHAT IS FACT FLUENCY?

In order for students to be successful as they progress into upper grades, they need to have a solid understanding of the concepts of addition and subtraction, and they also need to be fluent in the thinking strategies necessary for solving such facts. As you use the STEMscopes Math program, you will come to see how your students are starting to rely on their thinking skills and strategies as opposed to their fingers or skip-counting methods. Each grade level has numerous Fact Fluency activities.

Fours Mini-Lesson

DESCRIPTION

Students will practice their understanding of using double-double and half-half strategies.

MATERIALS

PRINTED

- 1 Set of game boards (per station)
- 1 Multiplication spinner (per station)
- 1 Division spinner (per station)

REUSABLE

- 30 Two-color counters (15 per player)
- 1 Paper clip (per station)
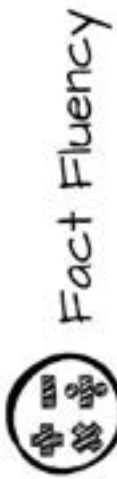- 1 Pencil (per station)

PREPARATION

- Allow students to have access to a variety of mathematical tools and models in order to scaffold their thinking.
- Print on card stock paper and laminate, if desired, for continued use.
- Have game board, spinners, and counters at each station's center ready for student use.
- Students will use the paper clip and pencil for the spinner.

PROCEDURE AND FACILITATION POINTS

1. Each station group will get out a multiplication game board, multiplication spinner, and counters for the group to share.
2. Game instructions:
   a. Player 1 is the red side of the counters and Player 2 is the yellow side of the counters.
   b. Player 1 spins the multiplication spinner.
   c. Player 1 multiplies the number spun by four.
   d. 4 Player 1 verbalizes the strategy.
   e. 5 Player 1 covers the product with a counter.
   f. Player 2 takes his or her turn, repeating the process.
   g. The game continues until one of the players has placed four adjacent counters of his or her own horizontally, diagonally, vertically, or in a square.
   h. If the product is already covered, the player loses a turn.
3. Each station group will take out a division game board, division spinner, and counters for the group to share.
4. Game instructions:
   a. Player 1 is the red side of the counters and Player 2 is the yellow side of the counters.
   b. Player 1 spins the division spinner.
   c. Player 1 divides the number spun by four.
   d. Player 1 verbalizes the strategy.
   e. Player 1 covers the quotient with a counter.
   f. Player 2 takes his or her turn, repeating the process.
   g. The game continues until one of the players has placed four adjacent counters of his or her own horizontally, diagonally, vertically, or in a square.
   h. If the quotient is already covered, the player loses a turn.
5. Each station can continue to play for the allotted time by selecting a new game board once one of the players has four adjacent counters placed on the game board.

Fact Fluency

Double-Double Round

Players: Two

Materials

★ Two-color counters (15 per player)
★ 1 Double-Double Game Board
★ 1 Multiplication spinner

Directions

1. Player 1 spins the spinner and does the following tasks:
   a. Multiplies the number spun by four
   b. Says the strategy
   c. Covers the product with a counter
2. Player 2 takes his or her turn, repeating the process.
3. The game continues until one of the players has placed four counters in a row horizontally, diagonally, vertically, or in a square.
4. If the product is already covered, the player loses a turn.

Fact Fluency: Fours
Game 1

Fact Fluency

28	12	16	40	24
20	36	28	12	8
24	40	32	16	20
8	16	8	32	28
4	12	24	36	12
32	36	40	14	6

DOUBLE-DOUBLE GAME BOARD A

Fact Fluency: Fours
Game 1

12	20	4	24	16
16	36	12	8	28
24	28	40	36	32
8	20	8	12	16
16	8	32	28	36
12	32	40	20	4

Fact Fluency

DOUBLE-DOUBLE GAME BOARD B

Fact Fluency

|				
20	28	32	24	4
8	4	28	36	16
28	8	20	16	40
32	40	24	12	36
16	24	8	32	12
4	12	36	40	28

DOUBLE-DOUBLE GAME BOARD C

Fact Fluency

Half-Half Round

Players: Two

Materials
★ Two-color counters (15 per player)
★ 1 Half-Half Game Board
★ 1 Division spinner

Directions
1. Player 1 spins the division spinner and does the following tasks:
   a. Divides the number spun by four
   b. Says the strategy
   c. Covers the quotient with a counter
2. Player 2 takes his or her turn, repeating the process.
3. The game continues until one of the players has placed four counters in a row horizontally, diagonally, vertically, or in a square.
4. If the quotient is already covered, the player loses a turn.

Fact Fluency: Fours
Game 1
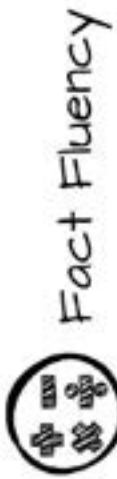
Fact Fluency

2	5	9	4	7
10	3	8	3	1
8	4	5	9	6
1	7	1	5	2
7	6	3	2	5
6	5	4	8	10

HALF-HALF GAME BOARD A

Fact Fluency: Fours
Game 1

Fact Fluency

5	9	3	2	7
1	5	4	5	8
7	1	10	6	5
10	6	8	7	1
4	5	3	10	2
9	8	4	6	3

HALF-HALF GAME BOARD B

Fact Fluency: Fours
Game 1
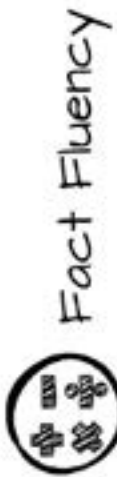
Fact Fluency

5	2	3	1	6
1	10	3	7	4
8	4	10	9	3
7	6	5	1	8
4	1	9	6	3
3	8	2	5	9

HALF-HALF GAME BOARD C

Fact Fluency: Fours
Game 1

÷ 4 Half-Half

24
20
8
16
12
40
36
4
32
28

Fact Fluency

× 4 Double-Double

3
5
10
1
6
7
8
4
2
6