Thematic Unit Plan: 4th Grade Fractions

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SAT 495-02

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Introduction

This is a unit plan about fractions for a fourth grade classroom. All lessons are aligned with Common Core State Standards. The unit plan builds on the basic fraction concepts that are taught in third grade and engages students in a variety of different activities. Reading, Writing, Art, Music, Science, Theater, and Physical Education/Physical Activity are all integrated within the unit. At the end of these six lessons, students will have the opportunity to show what they have learned through a culminating project, in which they will be writing their very own story using fractions. The end project allows students to tie in the fraction concepts that they have learned into a story in which the main character has real-life encounters with fractions. The overarching goal of this unit plan is for students to be able to discover more about fractions and apply them in a variety of real life situations. Having a solid understanding of fractions is important because they are used within many different life skills. By the end of this unit, students should have the fraction knowledge that they need for fifth grade mathematics, as well as the ability to use fractions, with confidence, in everyday situations.

Not only is this unit plan integrative, it is constructivist as well. Instead of using tedious lectures, students will construct their own learning through hands on activities, games, and projects. Students will be assessed using formative assessment procedures, which are done throughout the unit instead of using tests/summative assessment. Assessment will be based on the work they produce (including the final project), and through various homework assignments. The following integrative/constructivist unit is designed to allow students to practice and apply their understandings of fraction concepts, and to prepare them for what lies ahead in mathematics.

Lesson Plan One

Lesson Title	*Pizza Fractions*
Objectives and Goals	CCSS.MATH.CONTENT.4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. CCSS.MATH.CONTENT.3.NF.A.3.A Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. CCSS.MATH.CONTENT.3.NF.A.3.B Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model. CCSS.ELA-LITERACY.W.4.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
Integrated Subjects	- Reading - Writing - Art
Anticipatory Set	This lesson reviews and begins to expand fraction concepts that were taught in third grade. To begin the unit, the teacher will ask the class to think about their real life experiences/encounters with fractions. After students have a few minutes to think, the teacher will call on students to share their ideas while writing them down on large chart paper for the whole class to see. Some possible answers could be baking, science experiments, looking at a clock, at the store (1/2 everything sale), etc.
Instruction	Students will be introduced to our fraction unit with the read aloud of *Pizza Counting* by Christina Dobson. This book relates various fractions to the pizza slices to help explain what fractions are. Students will also incorporate their counting skills to help design pizzas with different toppings. Throughout the book, the teacher will stop and ask the students questions about what is happening in both the story and the illustrations. Possible questions could be: what do you think will happen next? What do you think the author meant by _____? What does (what the author said) mean? Etc. Make enlarged copies of the fraction pizza reproducibles (Appendix A) and tape them to the board. Invite three students to come up and color half of each pizza (note that one pizza is cut into fourths, one in eighths, and the other twelfths). Have the students sit down and ask the class to describe the differences that they see in each pizza. The students should notice that all three have half the pizza

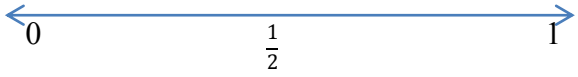
	colored in, but each one has a different amount of pieces colored (two, four, and six). Next to each pizza, write the total number of slices with a fraction bar on top. Ask students what the number below a fraction bar is called to refresh their memories (it is the denominator). Have three new students come up to the board to fill in the correct numerator (the number on top of the fraction bar). Point out that we just had the first three students color in ½ of the pizzas, so why do our three fractions have different numerators and denominators? Guide students to understand that the shaded portions are equal to each other even though each shaded portion has a different amount of pizza slices. Explain to the students that these are what we call **equivalent fractions** (write on the board).
Guided Practice	Students will now have the opportunity to create their own fraction pizzas. Each student will be provided with a circle cutout from brown construction paper to represent a pizza crust, and a pizza sauce splotch from red construction paper. Each cluster of tables will be given several sheets of yellow, black, green, and light brown construction paper so they can cut out their own pizza toppings (cheese, olives, green peppers, bacon, mushrooms) to put on their pizza. Students will have to decide how to divide their pizza into equal parts (they can use fourths, sixths, eights, etc.) and what pizza toppings they would like to put in each section. The students need to be sure they incorporate an equivalent fraction in some way (2/4, 4/8/ etc. = ½). Provide an example of your own pizza to show the class to help guide the students (for example, in my own pizza cut into fourths, I would have extra cheese on 2/4 (which is the same as ½) of the pizza, bacon on ¼, and green peppers on ¾). The goals of this project are to help students to visualize equivalent fractions (2/4 of the pizza equals ½) as well as refreshing their prior knowledge of basic fractions. After students create their pizza, they will be able to write about how to make their pizza (Appendix B). Students will be told that they have to be clear and concise with their writing so that the person reading could easily make the same exact pizza. They must use fractions when providing the ingredients in the instructions and write at least one equivalent fraction that they used. As an extension activity, have students read their recipes to a partner and have the partner recreate their pizza (using manipulative, extra construction paper, or through drawing). This allows students to see if their recipe is accurate and it allows students to practice using their fraction knowledge. After both pizzas and instructions are complete, students can staple the instructions to the pizza and the teacher can display student work in the classroom or hallway. Example of finished product:

	 Source:http://shenanigansinsecond.blogspot.com/2012/02/i-mustache-youhappy-valentines-day.html
Closure	Have the class come together and ask "what do equivalent fractions show?" (Call on volunteers to answer). Then ask the class "how can you tell, based on a picture, whether two fractions are equivalent?" (Call on volunteers). Allow students to come up to the board to draw/write out examples. Using an example that can directly be applied to the first standard listed in the objectives section would be beneficial. (1/2 is equivalent to a fraction (2x1)/(2x2)= 2/4). This allows students to mathematically see what makes one fraction equivalent to another. Pass out the equivalent fractions exit ticket (Appendix C) and have students fill it out and turn in. Answer questions if needed.
Independent Practice	For homework, students will be given a copy of the fraction bar reproducible homework (Appendix D). Students will color each row a different color and cut them out. Students will use the fraction bars to find 10 equivalent pairs and write them on a separate sheet of paper. Students will hand in their work the following day.
Required Materials/ Equipment	- *Pizza Counting* by Christina Dobson - Appendix A: Pizza fractions reproducibles - White board/chalk board and/or chart paper - Brown construction paper circle cutout - Red constriction paper pizza sauce splotch cutout - Several sheets of yellow, black, green, and light brown construction paper (enough for each cluster of desks) - Appendix B: How to Make A Pizza sheet - Appendix C: Equivalent fractions exit ticket - Appendix D: Fraction bar reproducible homework
Assessment and Follow Up	Students will be assessed based on the pizza that they made and the spelling/grammar of their How to Make a Pizza recipe. Their recipe should use different toppings, and be clear/easy for someone else to follow and create the exact same pizza. The students **must** have an equivalent fraction somewhere on their recipe. Students will also be assessed on the answers that they provide on their exit ticket as well as the equivalent fraction pairs from their homework.

Sources	http://www.lakeshorelearning.com/general_content/free_resources/teachers_corner/lessonplan.jsp?lessonplan=equivalentFraction http://shenanigansinsecond.blogspot.com/2012/02/i-mustache-youhappy-valentines-day.html http://betterlesson.com/community/document/924788/visual-rep-of-equivalent-fractions-exit-ticket-docx

Lesson Plan Two

Lesson Title	*Comparing Fractions Showdown*
Objectives and Goals	CCSS.MATH.CONTENT.4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. CCSS.MATH.CONTENT.3.NF.A.3.A Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. CCSS.MATH.CONTENT.4.NF.A.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
Integrated Subjects	- N/A
Anticipatory Set	Show the students the *Equivalent Fractions* video from YouTube (https://www.youtube.com/watch/?v=wL4hICyMLKU) as fun way for students to review what equivalent fractions are. This video uses different visuals to show the audience what equivalent fractions look like. Also included is a short clip from an animated children's show that puts equivalent fractions in a situational context. Explain to students that today, we will use our fraction knowledge to help us compare fractions to one another. Refresh students' memories on what greater than (>), less than (<), and equal to (=) mean.
Instruction	Explain to the class that when we compare fractions, we need to keep 4 different ideas in mind. Use the whiteboard or some large chart paper to explain these different ideas. Begin the first idea by writing $\frac{2}{8}$ ___ $\frac{5}{8}$ on the board. Ask the class "what do you notice about these two fractions?" Call on students to share thoughts. Ultimately, students should see that the two fractions have the same denominators. "So now we want to determine which fraction is larger. When two fractions have the same denominator, we compare the numerators. Keeping this in mind, who can guess which fraction is larger?" Answer is $\frac{5}{8}$. For a visual representation, draw two circles divided into eighths and have two students come up and shade in the correct portions. "So when we look at these circles, can we all agree that $\frac{2}{8}$ is less than $\frac{5}{8}$?" Students should all agree so have someone come

	up and draw the less than sign in between the two fractions. "Another way we can compare fractions is by relating the fraction to $\frac{1}{2}$. So let's say we want to compare $\frac{2}{6}$ and $\frac{6}{8}$ (write these fractions on the board). We could use a number line to help us with this." Draw a number line starting at zero and going to one. Be sure to mark $\frac{1}{2}$ in the middle. The number line should look like this:  "Let's start with deciding where $\frac{2}{6}$ would fit on our number line. I need to decide if $\frac{2}{6}$ is greater than or less than $\frac{1}{2}$. Who can tell me what an equivalent fraction to $\frac{1}{2}$ is that has the same denominator as $\frac{2}{6}$?" Call on students- someone should say $\frac{3}{6}$ is equivalent to $\frac{1}{2}$. Put this fraction next to $\frac{1}{2}$ on the number line in a different color so students remember. "So keeping this in mind, who thinks they know if $\frac{2}{6}$ is greater than or less than $\frac{1}{2}$ and can fill it in on our number line?" Call on a student- they should place the $\frac{2}{6}$ somewhere between 0 and $\frac{1}{2}$. Continue to do the same thing with $\frac{6}{8}$. Once $\frac{2}{6}$ and $\frac{6}{8}$ are on the number line, have a student put the correct symbol (>,<, or =) in between $\frac{2}{6}$ and $\frac{6}{8}$. Go on to explain the third and fourth ideas as explained on the handout Comparing Fractions (Appendix E). There are examples on the handout to teach changing the denominator to match the other and to change both denominators to a common denominator. Be sure to pass copies of this handout to students so they can keep it for reference and for use for the Guided Practice activity.
Guided Practice	To practice the comparing fraction ideas that they learned about during class instruction, students will be divided into groups of four to play a game called *Comparing Fractions Showdown*. Each group will receive a copy of the directions to the game, a fraction spinner, and the *Comparing Fractions Showdown* answer sheet (all included in Appendix F). Individual white boards and dry erase markers will also be helpful for group collaboration. Once students are into groups and all materials are passed out, have the students read the directions along with you. Emphasize that they need to use all four of our comparing fractions ideas when playing this game (the *Comparing Fractions Showdown* fraction sheet and the comparing fractions handout will help guide this). Answer any questions that the students might have and then have them play the game for about 15-20 minutes. Walk around to each group to sit in on their games to make sure they understand what they are doing.
Closure	After game play, have the class come together to discuss what they learned from the game. Some possible questions to ask: What did you all think about this game? What did you all learn from the game? etc. Call on several students to

	share some of the fraction pairs that they landed on and write them on the board. Have students show their answer and explain which comparing fractions idea that they used to reach that lesson. Collect group answer sheets. Make sure everyone writes their name on the sheet.
Independent Practice	For homework, students will complete the Comparing Fractions pizza worksheet (Appendix G). They will hand it in first thing the next class meeting.
Required Materials/ Equipment	- White board or chart paper - Appendix E - Appendix F - Individual white boards - Appendix G
Assessment and Follow Up	Students will be assessed on the fraction comparisons that they generate on the handout that goes with the game. Students will also be assessed on their homework assignment.
Sources	https://www.youtube.com/watch/?v=wL4hICyMLKU http://mathcoachscorner.blogspot.com/2012/12/comparing-fractions.html http://www.lauracandler.com/filecabinet/math/fractions.php http://www.lakeshorelearning.com/general_content/free_resources/teachers_corner/lessonplan.jsp?lessonplan=comparingOrdering

Lesson Plan Three

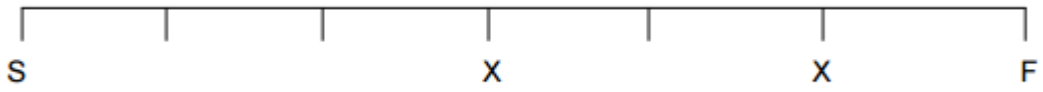
Lesson Title	*Miss Rizzo's Candy Company*
Objectives and Goals	CCSS.MATH.CONTENT.4.NF.B.3 Understand a fraction *a*/*b* with *a* > 1 as a sum of fractions 1/*b*. CCSS.MATH.CONTENT.4.NF.B.3.A Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. CCSS.MATH.CONTENT.4.NF.B.3.B Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.*
Integrated Subjects	- Music/Dance - Writing
Anticipatory Set	Begin the lesson by playing the song *How Easy is That?* (http://www.harcourtschool.com/jingles/jingles_all/35how_easy_is_that.html) which introduces adding and subtracting fractions to students. Only play the first half of the song (this is the half that discusses adding and subtracting fractions with LIKE denominators). This lesson does not focus on unlike denominators. Be sure to pass out the lyrics sheet (Appendix H) so students can sing along. Play the song twice: the first time is so students can hear and read along with the song, the second time is so students can sing and dance along.
Instruction	After the students get the opportunity to sing and dance along with the song, have the students sit so discussion about the song can take place. Some questions to ask could be: What fraction ideas did you find in the song? What do we do when we want to add like fractions? What do we do when we want to subtract like fractions? etc. In today's activity, students will create their very own candy bars from different colored linking unifix cubes. Each color will represent a different flavor of candy. The bars come in different sizes depending on the number of candies the buyer wants. The teacher will need to make a bar using 8 total unifix cubes prior to the beginning of class. "Today we are going to pretend to visit a special candy store called Miss Rizzo's Candy Company. At the candy store, there is a very unique candy bar called the Special Bar. This bar is special because the buyer of the bar is able to pick out all the flavors that will be in the bar. This way each bar is different and the buyer can get exactly what they want. "Let's look at the Special Bar that I made on my visit." Share with student a bar you created that has 8 pieces.

	 Take a moment to discuss the flavors that are possible (write on the board): Red – Cherry Blue – Blueberry Light Green – Lime White – Marshmallow Brown – Chocolate Black – Licorice Yellow – Banana Pink – Cotton Candy Dark Green – Apple Orange - Orange Suggested questions: Which flavor of candy do I have the most of? Which flavor of candy do I have the least of? How do you know which candy I have the most of? How much of my bar is flavored blueberry? Cherry? Banana? Lime? etc. **Note:** The answers of the students should be in fraction form. You are not asking how many pieces are certain flavors, but how much of the bar is that flavor. As students tell you the fraction for each flavor, record the fractions on the board. If I add up the all the fractions 3/8 + 4/8 + 1/8 I will get 8/8 which is the whole candy bar.
Guided Practice	Students will now have the chance to create their own Special Bars of different sizes and record them on their *Miss Rizzo's Candy Company* activity sheets (Appendix I). First, students will build a Special Bar that has eight pieces of candy (using unifix cubes). They will then color in their candy bar the activity sheet. Next, students will write an equation to show the different components of their Special Bar (like what was done during the instruction section). Students will repeat the process with Special Bars of different sizes (10 and 12 pieces). As the students are building and recording the bars, the teacher should walk around to question the students' work. Suggested questions: How many (flavor) pieces do you have? How many more pieces would you need to complete a bar? Which do you have more of? Less of? Equal to? What does your equation look like? How are you getting the fractions for your equation? Make sure the representations and equations that are being recorded are correct. After all three Special Bars and equations have been created, students will write a story problem about their favorite Special Bar. An example that the teacher could present to the class could be: "Miss Rizzo's 10 piece Special Bar was 4/10 cotton candy, 5/10 marshmallow, and 1/10 orange. Her dog, Milo, ate all of the cotton candy pieces while she was teaching at school. How much of Miss Rizzo's Special Bar was remaining?

Closure	When students complete their three Special Bars and story problem, have them get together with a partner. One partner will re-create their favorite Special Bar from the day with the unifix cubes and the other partner will try to figure out the proper equation that would go with that bar. After both partners have shared their favorite Special Bars and equations, each partner should solve each other's story problem. The class will then come together as a group and to answer any questions that students might have about the activity. The teacher should call on a few students to share their favorite Special Bar's, equations, and story problems with the whole class.
Independent Practice	At home, students will complete the Skittles Fraction Challenge activity (Appendix J). This is a fun activity for students to do that ties in with the candy theme for this lesson. The teacher will need to provide each student with a regular bag of skittles (size that you would see when checking out at a grocery store). Emphasize that students SHOULD NOT eat their candy until they have completed the activity. Students should bring this activity to school the next day to be handed in and/or discussed in small groups. **Note:** the activity asks what fraction of their Skittles are brown- this is meant to be a trick! There are no brown Skittles.
Required Materials/ Equipment	- *How Easy is That?* music: http://www.harcourtschool.com/jingles/jingles_all/35how_easy_is_that.html - Appendix H - Unifix cubes - Crayons - White board/chalk board - Appendix I - Appendix J - Fun Size bags of Skittles (enough so each students has their own bag)
Assessment and Follow Up	Students will be assessed on the work that they produce on the Miss Rizzo's Candy Company activity sheets as well as the work they produce for the Skittles Fraction Challenge Activity. The teacher should be checking for understanding throughout the entire lesson (through student questions and participation).
Sources	http://www.harcourtschool.com/jingles/jingles_all/35how_easy_is_that.html http://maccss.ncdpi.wikispaces.net/file/view/4thGradeUnit.pdf https://www.teacherspayteachers.com/Product/Skittles-Fraction-Challenge-Grades-4-5-548471

Lesson Plan Four

Lesson Title	*Fraction Relay Race*
Objectives and Goals	CCSS.MATH.CONTENT.4.NF.B.3 Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. CCSS.MATH.CONTENT.4.NF.B.3.A Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. CCSS.MATH.CONTENT.4.NF.B.3.B Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.*
Integrated Subjects	- Theater/Acting - Physical Education/Physical Activity
Anticipatory Set	This lesson gets students out of their seats and moving in a variety of different ways. To begin this movement lesson, the class will play Fraction Charades. Split students up into teams. Each team will take turns acting out various fractions. The other teams have to guess what the fraction is. The team that guesses correctly gets a point! Kids have to really think out of the box on how to portray their fraction. Example below- 1/3 of the students are jumping:  Play this fun game for about 15 minutes to get the students' brains warmed up for fractions.
Instruction	Tell the class: "Today we are going to get ready for a relay race. Before we run the race we need to make a plan. Each team will have three people on it. Each person on a team has to run in the race, but they do not need to run the same distance. There are certain places during the race where you can hand off the baton to the next runner. You are going to get a chance to plan the distances of each runner on your team before the race begins. Let's work together to try to make a plan for a team. Today's race will have different places that a team can hand off their baton to the next runner." Draw a line on the board with a start and finish line. Mark 5 locations, equal

	distance apart, where students can hand off the baton. This will break the track into 6 separate sections. Students may have a difficult time with the concept that there are 5 locations to hand off, but 6 sections to the race. This is a good time to discuss the fact that the distance between the marks is what we are considering and not the marks. Have students talk with their teammates (groups of three) to determine some possibilities to setting up the race. Remember that each person doesn't have to run the same distance. Share a few of the students' ideas, and ask what fraction of the race each student will need to run.  In the race above, the first runner runs 3/6 of the race, the second runner runs 2/6, and the final runner runs 1/6. Write an equation for each idea. 3/6 + 2/6 + 1/6 = 6/6 or 1 whole Look for multiple ways to set up the race.
Guided Practice	Students will work on planning four different races with their teammates. For each race the student teams need to find multiple ways to set up each race. They record the distance each runner will run, and then write an equation that will equal one whole. Each team should record this information in the Fractions Relay Races Handouts (Appendix K). Have students share their possibilities for each race with other teams and discuss their favorite and the reason why they chose it. Encourage students to make a connection between their races and a number line from 0 – 1. How are these similar? If the weather allows, head outside so students can set up their races using cones as hand off positions (do this in the gym, if available, if the weather is not good). Have the students run the race according to their plans. Have them record any questions they might have and some their observations throughout their races. What are some possibilities if we had only 2 people on a team? 4 people? (Pose these questions and have them answer in their math notebooks). If students are having difficulties provide them with fraction manipulatives (fraction bars, fraction tiles) to help them visualize the idea of decomposing a whole unit.
Closure	Once teams have completed their races, have them design a relay race that is 2 laps long so they have to decompose the number 2. You could also have them design a race that is 2 ½ laps long. This is supposed to be a challenge so students' will think further about decomposing fractions. Students can complete this in their individual math notebooks.

Independent Practice	For homework, students will complete two fraction crossword puzzles (Appendix L). Students should bring this back to school with them the next day to turn in.
Required Materials/ Equipment	- White board - Appendix K - Cones - Gymnasium (if available & if weather is not good) - Fraction manipulatives - Math notebooks
Assessment and Follow Up	While students are working, observe them and pose questions to check for their mathematical understanding. Assess students based on their participation and the results from the relay handouts. Be sure to check the equations that they are producing as well.
Sources	http://eisforexplore.blogspot.com/2012/08/fraction-charades.html http://maccss.ncdpi.wikispaces.net/file/view/4thGradeUnit.pdf https://www.teacherspayteachers.com/Product/FREE-Fraction-Crossword-Puzzles-Adding-and-Subtracting-1152554

Lesson Plan Five

Lesson Title	*Fraction Nature Walk*
Objectives and Goals	CCSS.MATH.CONTENT.4.NF.C.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.[2] *For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.* CCSS.MATH.CONTENT.4.NF.C.6 Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.*
Integrated Subjects	- Music - Science - Writing
Anticipatory Set	To begin this lesson and a new major fraction concept, students will watch and listen to a song on YouTube called *Fractions and Decimals* (https://www.youtube.com/watch?v=9Bx-8aLZVbg). Play the video up until 1:36. After this point, the song talks about percentages which are not covered in this lesson. Invite the students to sing and dance along. Play the video twice so students can take away the main points. This is a fun video to introduce changing fractions into decimals.
Instruction	Students need to know that fractions and decimals are both ways of expressing parts of a whole. Start a basic review lesson by drawing a square on the board. Draw a line vertically through the center of the square. Ask students what fractions you have drawn. [The answer is a 1/2 and a 1/2.] Write an equation on the board showing how two halves added together equal a whole. [1/2 + 1/2 = 2/2 or 1]. Tell the class that today we will be learning about another important fraction concept- decimals. Decimals, like fractions, are another way of expressing portions of a whole. Ask the class if they remember learning about decimals before in second or third grade. Call on a few students to share what they know. Invite them to write their ideas on the board. Tell students that they may be familiar with decimals as they are used with money (100 cents = $1.00, 50 cents = $0.50). When you say a decimal out loud, you express it in terms of tenths, hundredths, or thousandths. The first place after the decimal point represents 10ths, the 2nd place represents 100ths, and the 3rd place represents 1,000ths. For example, you say the decimal 0.2 as two tenths. You say the decimal 0.25 as twenty-five hundredths. You say the decimal 0.125 as one hundred and twenty-five thousandths.

	Have students look back at the square that was drawn on the board at the beginning of the lesson. Ask students to think about how they would write the fraction ½ as a decimal. Call on some volunteers to answer. Then have a student, or students, come to the board and write the equation in decimals. The equation in decimals is 0.5 + 0.5 = 1.0. Also explain that another way that you can find the decimal equivalent of a fraction, is by dividing the numerator (the top number of a fraction) by the denominator (the bottom number of a fraction). So 1/2 is 1 ÷ 2 or 0.5. As soon as you say a decimal aloud, students can see how it converts into a fraction. After converting a decimal to a fraction, show how to simplify it. For example, 0.2 is 2/10, which can be reduced to 1/5. 0.25 is 25/100, which can be simplified to 1/4.
Guided Practice	Today students will discover more about decimals and fractions through a science nature walk around the playground and school campus. Students will need to bring a copy of the Nature Walk handout (Appendix M), a pencil, and clipboards on this nature walk. Before heading outside to do this activity, explain that students will be on the lookout for different leaves, flowers/plants, and animals/insects. Students will have to find at least 10 of each of these items and record what they see on their handout. If students don't know the name of a certain leaf, flower, or animal, they should write down a description of what they observe and they can use this for a research project that can be done as an extension to this lesson. Once students have all their data, have the class come together inside and begin their calculations for each group of nature walk items. For example, in my animals/insects group, if I saw 4 rabbits, 3 robins, 1 butterfly, and 2 bumblebees on my walk, I would write 4/10, 3/10, 1/10, and 2/10 for the corresponding fractions (10 is the denominator because I these were the 10 animals and insects that I saw on the walk). I would also write an equation showing that adding all of these fractions together would equal 1 whole. Then I would write the decimals for each: .40, .30, .10, and .20. Students should do this for each group of nature walk items.
Closure	Once students have completed their calculations, have each student find a partner and each person will share what they saw on the nature walk. To end the lesson, have students write a one paragraph reflection about what they learned, saw, and enjoyed from the nature walk. Students should also write about one of the leaves, flowers, or animals that they would like to further research. Use this portion as a possible opportunity to have students do a report about what they are interested in learning more about. They can make this report as a PowerPoint presentation, a poster, or a storybook so that way they can teach others about what they have learned.
Independent Practice	For homework, students should complete the fraction to decimal conversion activity (Appendix N). Students will need to bring this to class the next day.

Required Materials/ Equipment	- YouTube video: https://www.youtube.com/watch?v=9Bx-8aLZVbg - Whiteboard - Appendix M - Clipboards - Appendix N
Assessment and Follow Up	While students are working, observe them and pose questions to check for their mathematical understanding. Assess students based on their participation and what they produce on the handout and homework. Be sure to check the equations and decimals that they are producing as well on the class activity. If the extension activity is being used, assess students on the quality of their reports: Is it informative? Is it creative? Does it include pictures? etc.
Sources	https://www.youtube.com/watch?v=9Bx-8aLZVbg http://www.scholastic.com/browse/lessonplan.jsp?id=1154 http://www.scholastic.com/browse/lessonplan.jsp?id=1155 https://www.teacherspayteachers.com/Product/FREE-Fraction-Decimal-Percent-Conversion-Common-Core-4NF6-449367

Lesson Plan Six

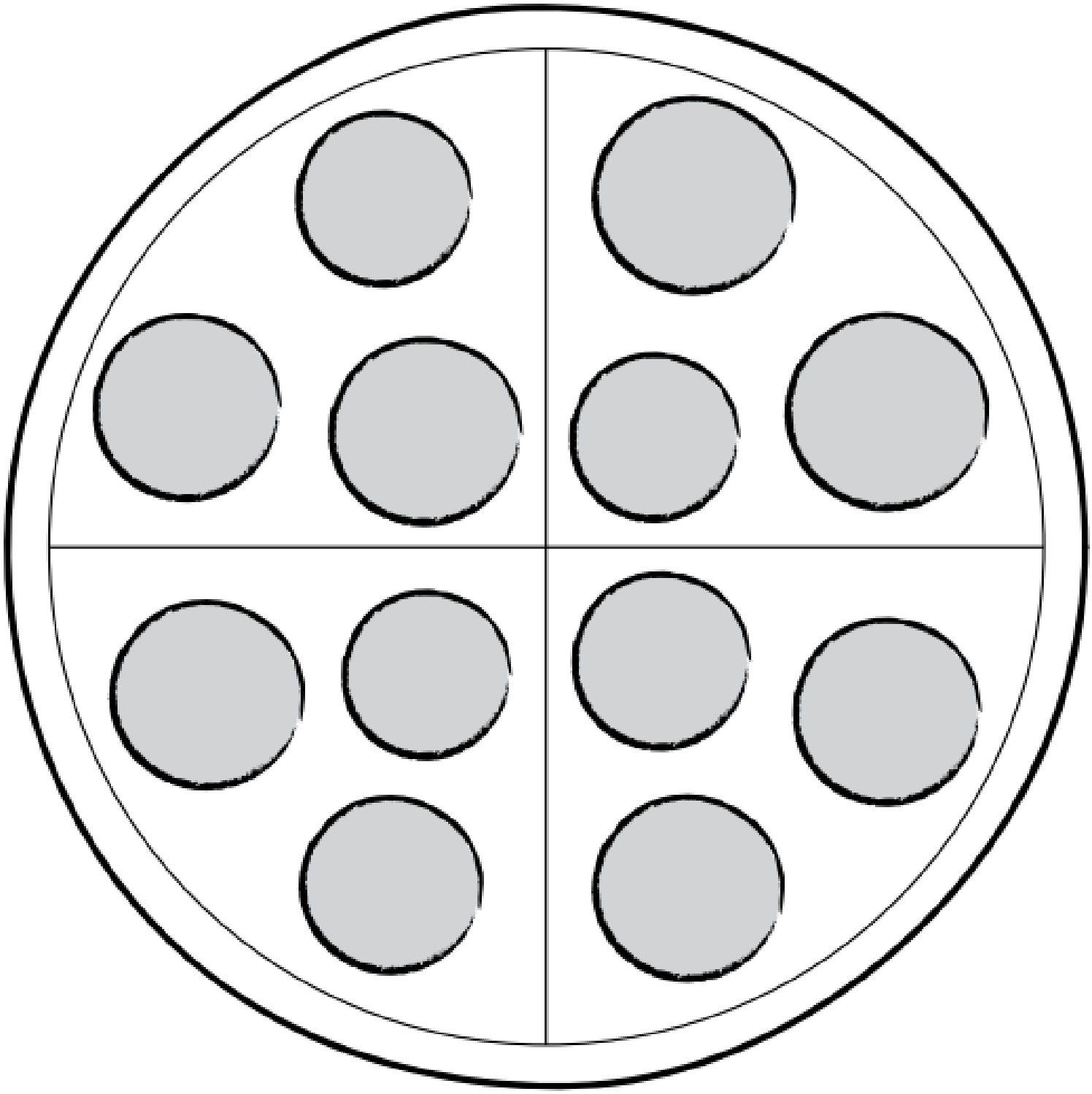
Lesson Title	*Fraction Boot Camp/Fraction Story Time*
Objectives and Goals	CCSS.MATH.CONTENT.4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. CCSS.MATH.CONTENT.4.NF.B.3 Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. CCSS.MATH.CONTENT.4.NF.B.3.A Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. CCSS.MATH.CONTENT.4.NF.B.3.B Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8*. CCSS.MATH.CONTENT.4.NF.B.3.D Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem. CCSS.ELA-LITERACY.W.4.3 Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences. CCSS.ELA-LITERACY.W.4.3.A Orient the reader by establishing a situation and introducing a narrator and/or characters; organize an event sequence that unfolds naturally.
Integrated Subjects	- Writing - Art
Anticipatory Set	**This lesson will probably need to be divided into two days. Fraction Boot Camp will be done the first day and fraction story time will be done the second. Begin this lesson by reminding students that they have learned a lot about fractions over the last few weeks. Ask the class to have someone raise their hand to explain what a fraction is. Someone should say that a fraction is part of a whole (write this on the board). Ask the class to think of some of the important concepts that they have learned throughout this unit. Now, have them share this idea with a partner. Come together as a class to have students share what they have discussed. Write these ideas on the board. Ideas should be from what has

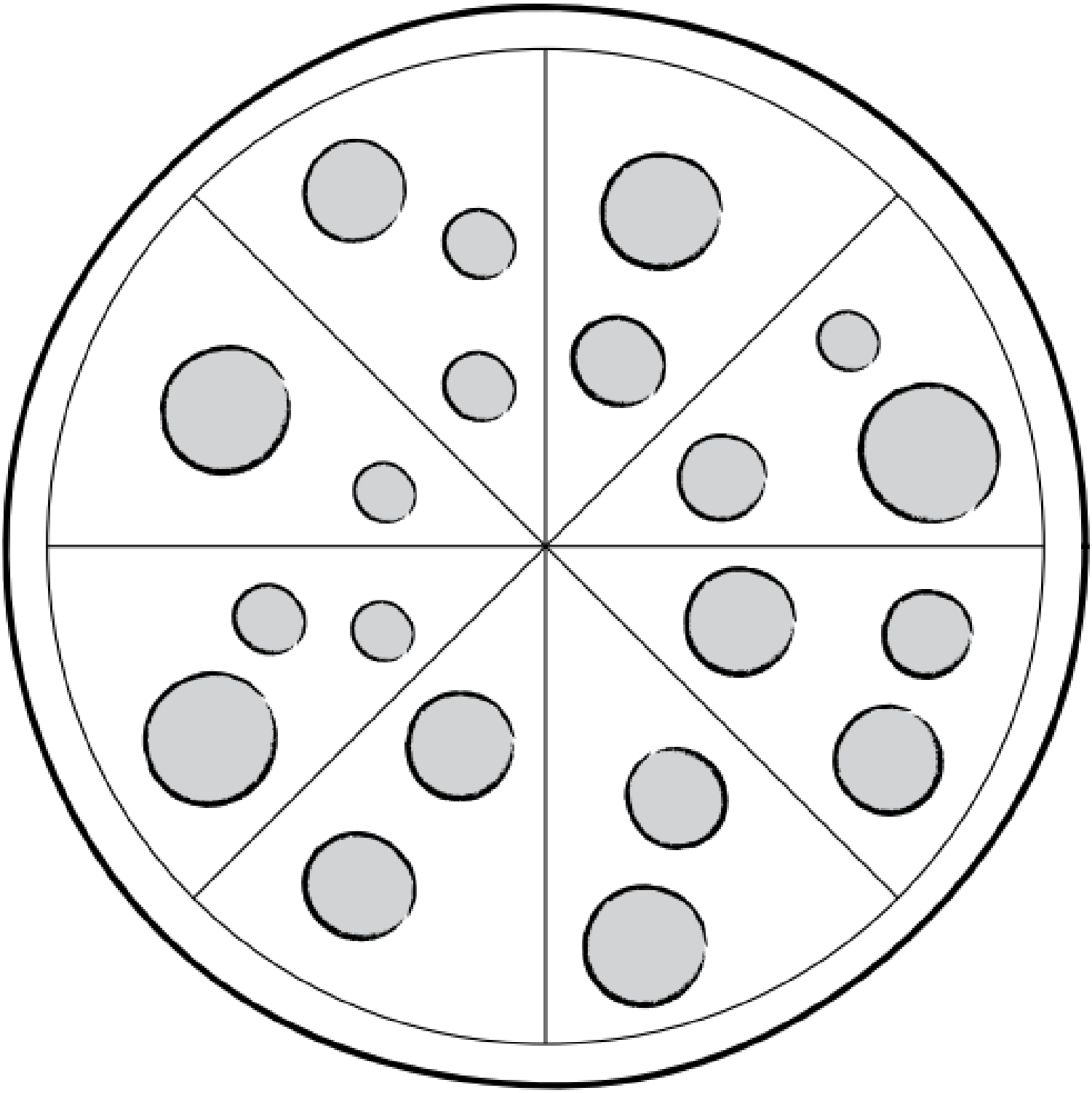
	recently been taught (i.e. equivalent fractions, adding and subtracting fractions, etc.). Explain to the class that today we will begin reviewing what we have learned about fractions by participating in a Fraction Boot Camp. Once we have successfully completed the boot camp, we will have the chance to write our own fraction stories.
Instruction	Tell students that during the Fraction Boot Camp, they will be working through five different math centers to practice their fraction skills. Model and give directions for each center. Students should be divided into four groups and will spend about 10-15 minutes at each center. **Center 1: Zombie Fractions** Objective: Students will use a visual model to decompose fractions. Materials: Appendix O At this center, students will be decomposing fractions (separating fractions into small pieces). To do this, students will choose a fraction card, then will write as many ways to decompose the fraction as possible. For example: 5/6 - 1/6 +1/6 + 1/6 + 1/6 = 5/6 - 3/6 + 2/6 = 5/6 - 2/6 + 1/6 + 1/6 +1/6 = 5/6 - 4/6 + 1/6 = 5/6 - 3/6 + 1/6 + 1/6 = 5/6 **Center 2: Clothespin Fraction Line** Objective: Students will order fractions with different denominators. Materials: Clothespins and string Provide students with clothespins with fractions of various denominators and a string to sort them on. Have students mix the clothespins, them put them in order. Students record their ordered fractions on a number line. You can differentiate this center by providing different numbers of clothespins to order or by requiring students to estimate the amount that exists between each clothespin on the number line and space the clothespins accordingly. **Center 3: Fraction Card Comparison** Objective: Students will compare fractions with unlike denominators. Materials: Appendix P and playing cards Provide students with a fraction game board (a paper with two fraction bars that specify where the numerator and denominator are) and playing number cards. The game is played like war. Students place cards on the numerator and denominator spaces at the same time. The first person to identify the larger fraction by tapping or placing their hand on the fraction that is larger gets all four

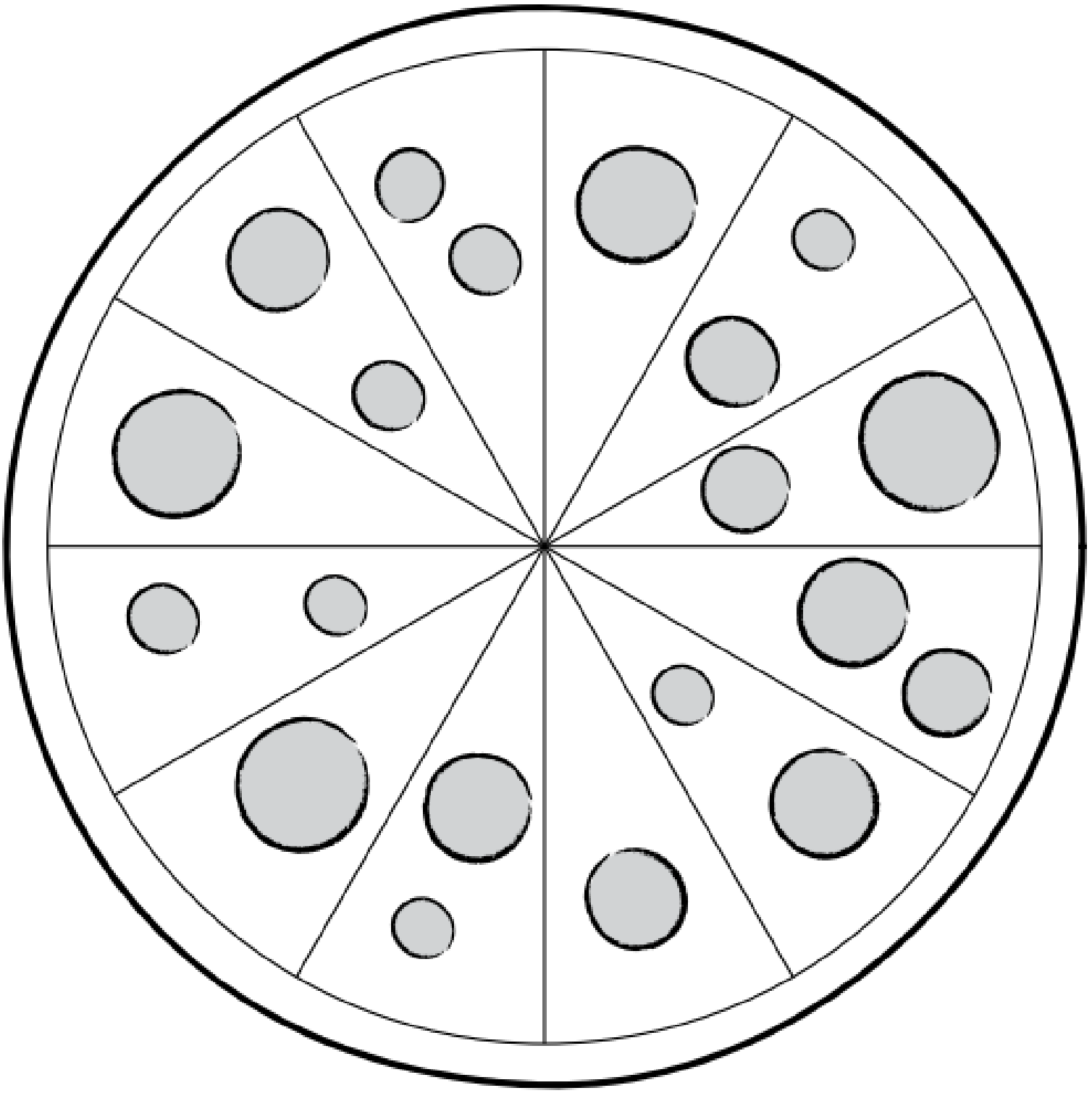
	cards. As students develop their knowledge of fractions, you can write a denominator for students to use consistently. (For example, have students write 10 in the bottom of the fraction, so that all the fractions are consistently less than one). **Center 4: Fraction Word Problems** Objective: Students will solve word problems that require addition and subtraction of fractions. Materials: Appendix Q Provide students with note cards with fraction word problems written on them. Have students work in pairs to solve each problem. Make these problems more challenging by requiring students to reduce their answers. **Center 5: Equivalent Fractions Spaceman Go Fish** Objective: Students will find and match equivalent fraction pairs. Materials: Appendix R - Shuffle the 32 cards. Deal 5 cards to each player. - Place the remaining cards face-down in the center forming the draw deck. - Start with the dealer. Ask any player for a card you would like to match with a current card in your hand. If you have ½ , you may ask any person for the equivalent fraction of ½ to complete your pair. - Lay the matching pair down. - If the player does not have the card you asked for, they will say "Go Fish!" and you draw a new card from the draw deck. - Continue playing clockwise to the next player. - Continue playing until there are no cards left in the draw deck. - Complete the game by continuing play as normal, but without the draw deck, until all possible pairs have been matched. - Count each players number of pairs. The player with the most pairs is the winner of the game! Have these directions written on the board or typed on a handout for the station. Good idea to laminate the cards before the students play.
Guided Practice	Either the next day, or after Fraction Boot Camp (if time allows), tell students that we will conclude our fraction unit by creating our very own fraction stories. We will take our fraction concepts, and create a story, with characters and a plot, to show what we have learned. We will also complete our stories with illustrations. Write the requirements for the story on the board: - Needs a character - A plot - Beginning, middle, and end - Illustrations - At least 3 fraction concepts that we have discussed over the last few weeks Share an example with the class. For instance, write a story about a girl, Sally, who bakes a huge cake for all of her friends. You can include the recipe and all of the steps needed to make the cake. After making the cake, Sally goes to deliver

	the cake to her friends. She stops at her Billy's house and offers him some cake. You cut the cake into 10 equal pieces. Billy says he wants 2/10 of the cake. Sally realizes that this is the same as 1/5 of the cake. The story goes on and Sally runs into John and Jessie. John wants 3 pieces of the cake and Jessie wants 4. Sally uses subtraction to figure out how many pieces she has left after Billy took some and addition to figure out how many piece John and Jessie want together. Sally subtracts again to figure out how many pieces she has left for herself. Sally looks back on her day and realizes that 2/10 + 3/10 + 4/10 + 1/10 = 1 whole cake. She eats her cake satisfied with all the fraction knowledge that she used throughout the day. (Obviously, make this idea into a complete story and make your own story book with illustrations to show the class as an example)
Closure	Once students have edited their books and included illustrations, have them read their story aloud to a small group. You can even bind the books (if you have the materials necessary) and invite other classes and/or parents to the class to come and read the books. It would be like the students got to publish their books and they can feel proud of their work. Have sticky notes around the room as well so parents and other students can leave feedback on the stories.
Independent Practice	For independent practice, you could have students make an outline using a specific graphic organizer of their story (this would have to be done BEFORE they write their story for a 2 day lesson). This could be given as homework after the boot camp activity so that way students can prepare their thoughts and ideas for the next class period. Students could even create an outline/draft of the story to have the teacher look at before putting their story down on paper.
Required Materials/ Equipment	- White board - Appendix O - Clothespins and string - Appendix P - Playing cards - Appendix Q - Appendix R
Assessment and Follow Up	Assess students based on the quality of work provided in the story that they have created. Was it creative? Was there a plot? Were there at least 3 fraction concepts used in the story? Were there illustrations? Does the student understand and use the fraction concepts appropriately? Address any questions that might arise during the boot camp and throughout the writing process.
Sources	http://lessonplanspage.com/grades-4-5-fraction-boot-camp/ http://www.fernsmithsclassroomideas.com/2015/02/ferns-freebie-friday-free-go-spaceman.html

Appendix A







Appendix B

HOW TO MAKE A PIZZA:

A RECIPE BY: _____

INGREDIENTS:

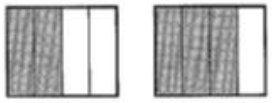
Appendix C

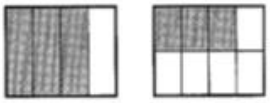
Name: _____

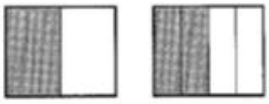
Exit ticket

1. Which set of fractions is equivalent?

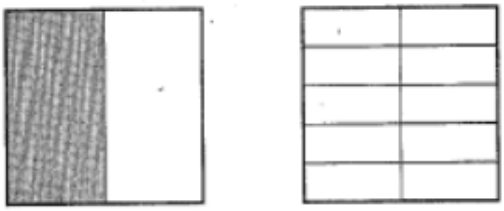
a. 

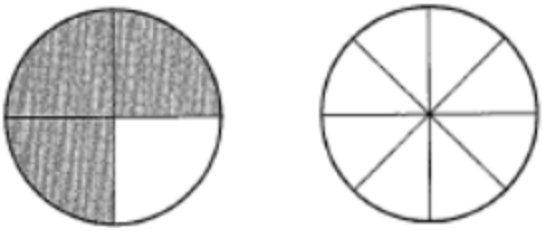
b. 

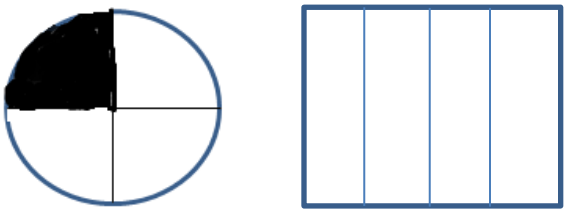
c. 

d. 

For numbers 2-4, shade an equivalent fraction to the amount shown.

2. 

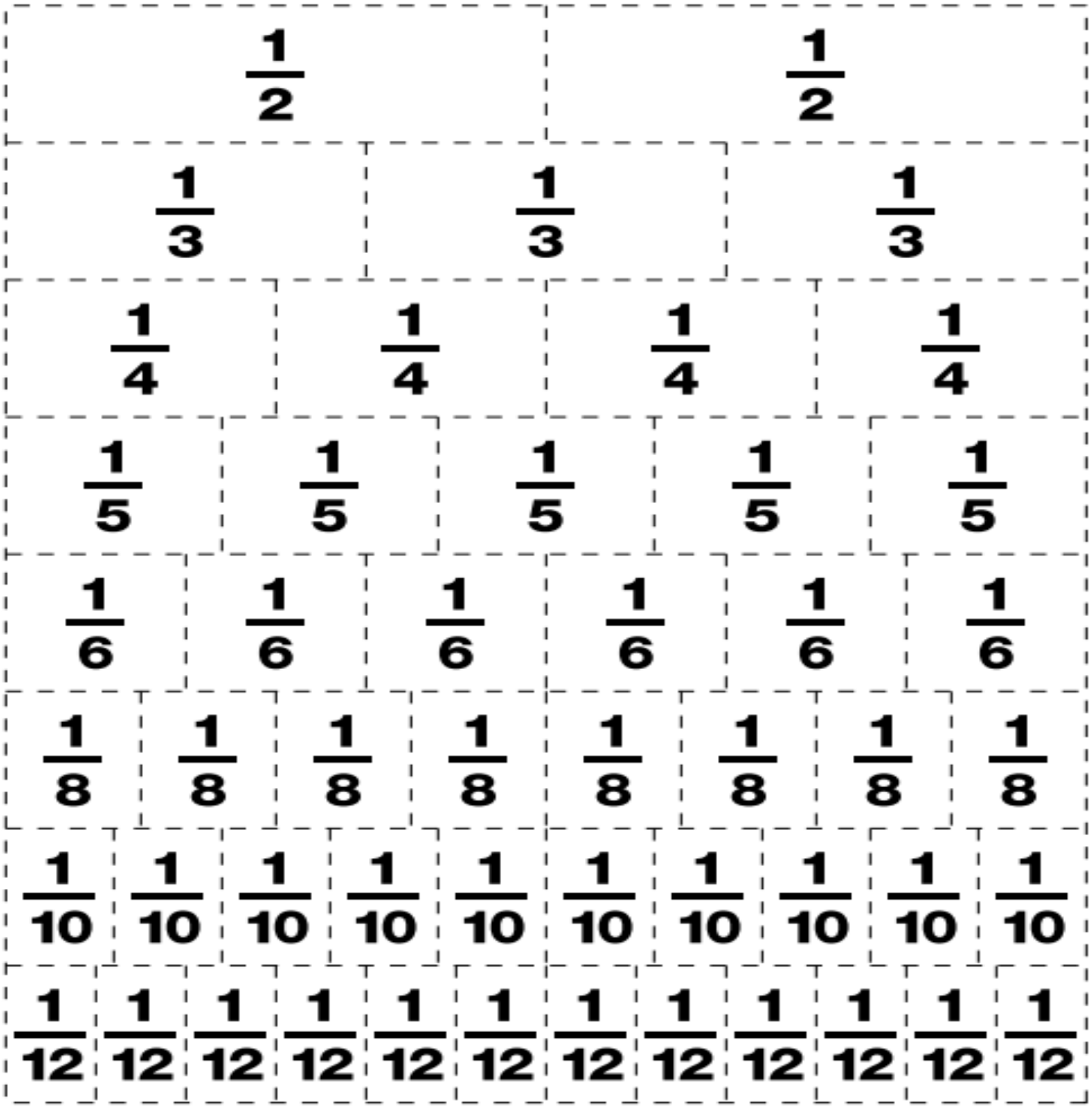
3. 

4. 

Appendix D

Directions: Color each row (fraction bar) a different color and then cut each row out. Use the fraction bars to find 10 **equivalent fraction** pairs. Write your fraction pairs on a separate piece of paper and bring to school tomorrow.

For example: $\frac{1}{2} = \frac{3}{6}$

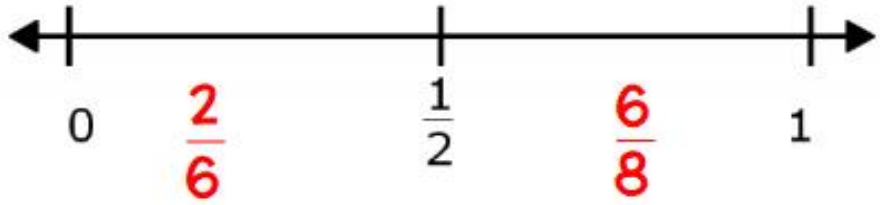


COMPARING FRACTIONS

❶ Same denominator—compare the numerators

$$\frac{2}{8} < \frac{5}{8}$$

❷ Relate to $\frac{1}{2}$



$$\frac{2}{6} < \frac{6}{8}$$

❸ Change the denominator of one to match the other

$\frac{2}{5}$ and $\frac{3}{10}$ $\quad \frac{2}{5} \times \frac{2}{2} = \frac{4}{10}$ $\quad \frac{2}{5} > \frac{3}{10}$

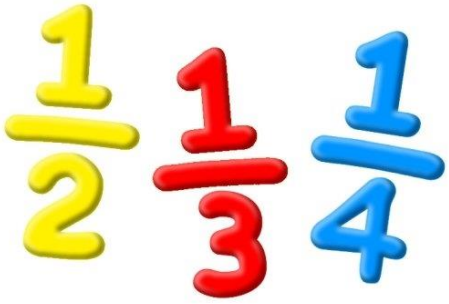
❹ Change both denominators to a common denominator

$\frac{7}{8}$ and $\frac{5}{6}$ $\quad \frac{7}{8} \times \frac{3}{3} = \frac{21}{24}$ $\quad \frac{5}{6} \times \frac{4}{4} = \frac{20}{24}$

$$\frac{7}{8} > \frac{5}{6}$$

comparing fractions showdown

Materials: Dry Erase Boards and markers, Fraction Spinner, comparing fractions showdown answer sheet, pencil

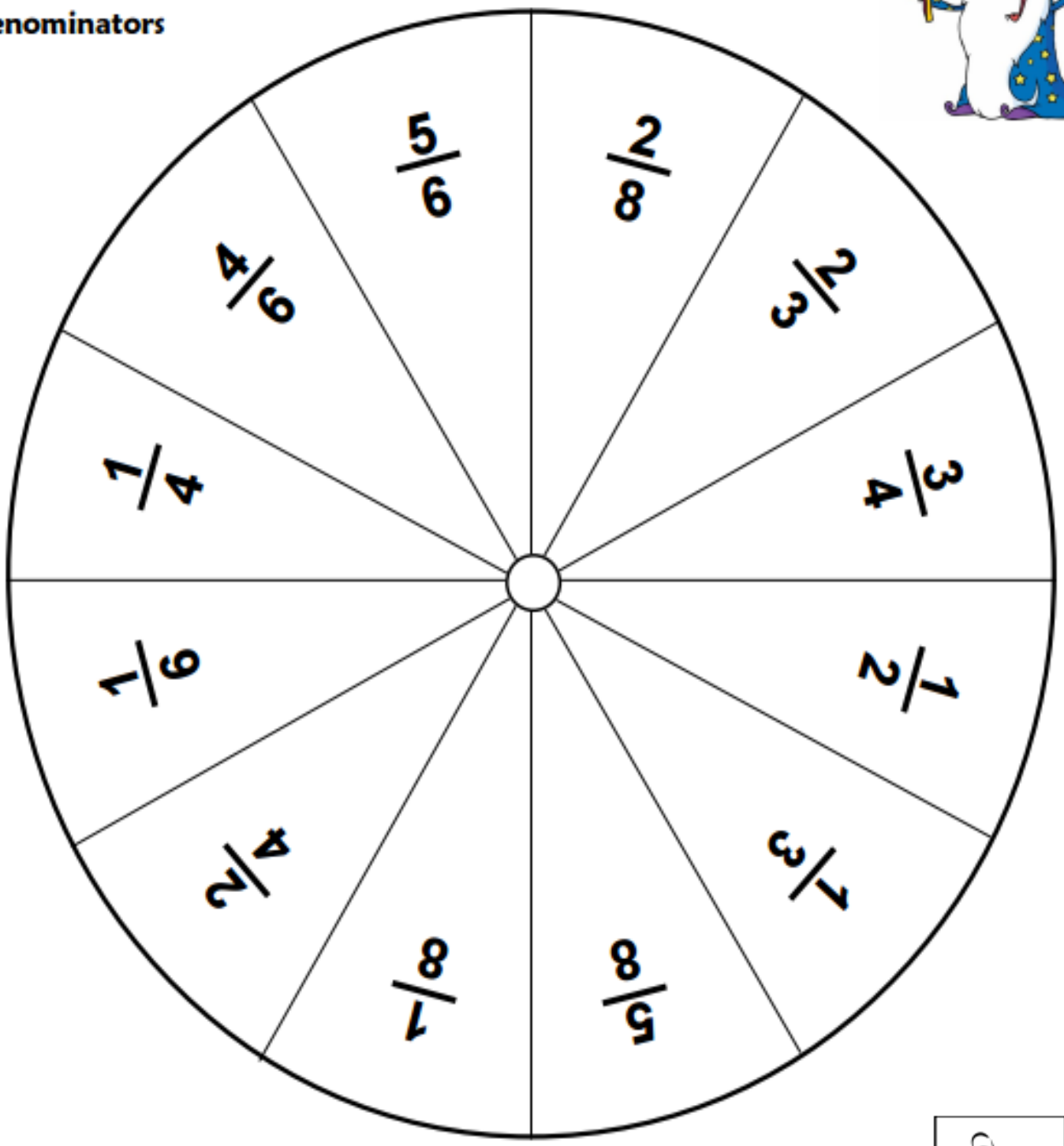


Directions:

1. Each student needs a dry erase board, marker, and one comparing fractions showdown answer sheet for the whole group.
2. The student with the shortest first name is the first Leader. The Leader spins the Fraction Spinner twice and everyone writes down the two fractions that the spinner lands on their white board.
3. Everyone will try to compare the two fractions. Write <, >, or = between the fractions. No discussion at this point! Use your Comparing Fractions handout if needed.
4. When everyone has an answer, they place their boards face down in front of them.
5. The leader says Showdown! Everyone turns their boards over to show their answers. Then they check their solutions by explaining which comparing fractions idea that they used.
6. The leader writes the two fractions on the Fractions Showdown answer sheet under the idea that was used. Each idea MUST be used at least once.
7. The role of Leader rotates to the left for each round. Repeat steps 2 through 6 until time runs out.

Fraction Spinner

Different Denominators



Directions: To use the spinner, you'll need a paper clip and a pencil. Put the paper clip down with one end over the center dot. Put the pencil point down inside the paper clip and hold the pencil in place. Thump the paper clip. It will spin around the pencil point and point to one section on the Fraction Spinner.

comparing fractions showdown
answer sheet

Comparing the numerators

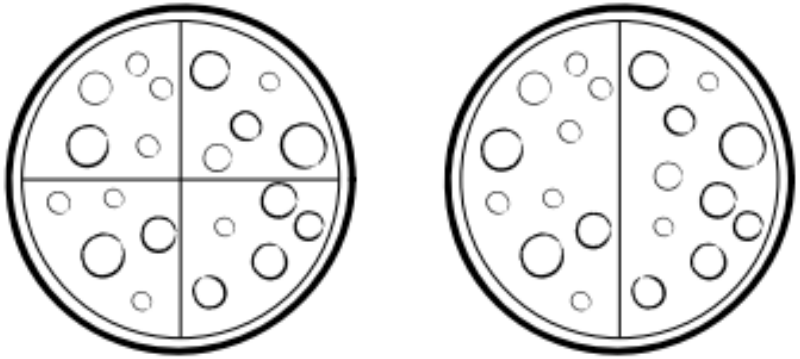
Relating to $\frac{1}{2}$

Change the denominator of one to match the other

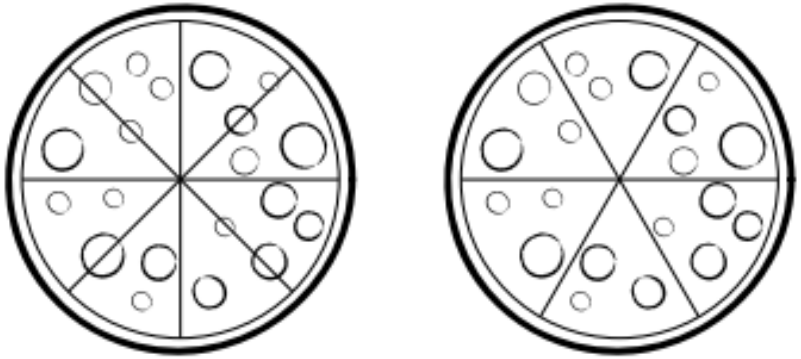
Change the denominators to common denominators

Comparing Fractions

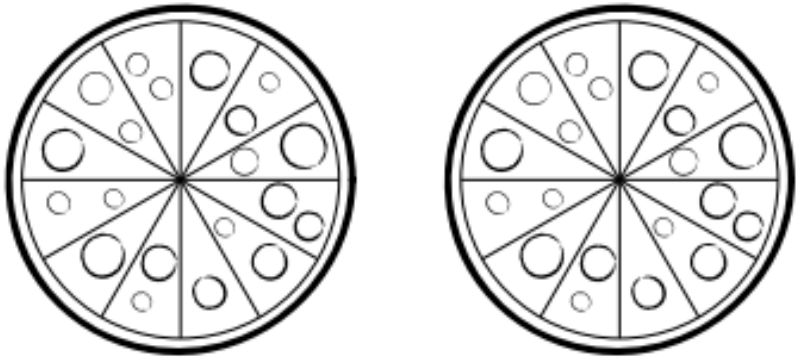
Directions: Shade in the fractions on each pizza and compare. Then write the correct sign.



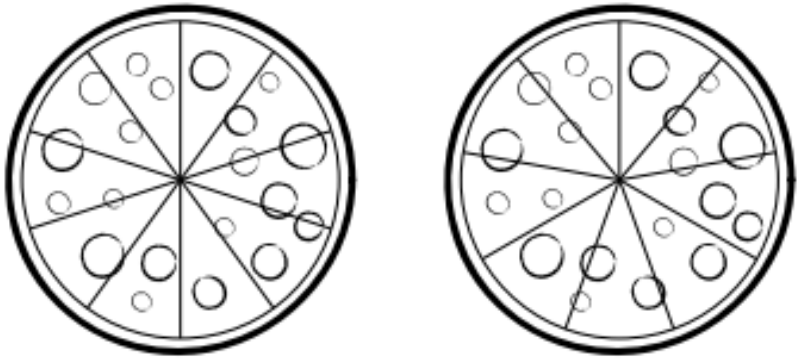
$\frac{2}{4} \_\_\_ \frac{1}{2}$



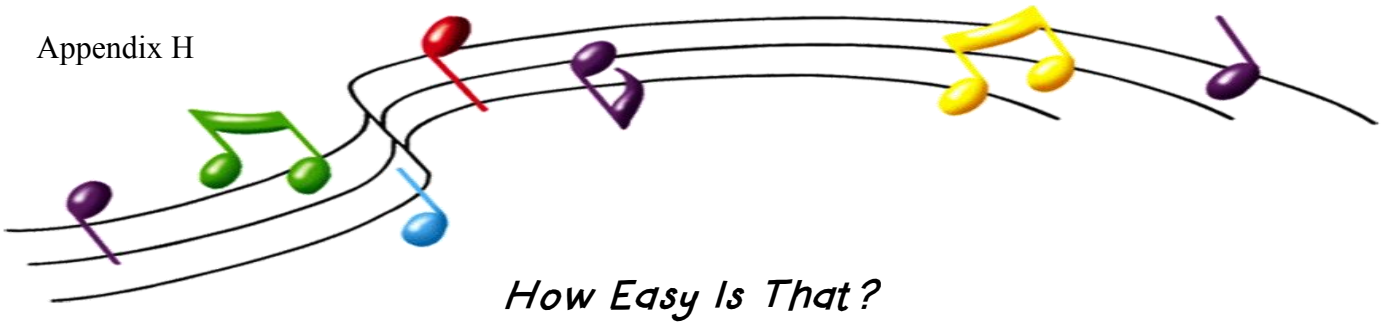
$\frac{7}{8} \_\_\_ \frac{5}{6}$



$\frac{6}{12} \_\_\_ \frac{4}{12}$



$\frac{3}{10} \_\_\_ \frac{5}{9}$



How Easy Is That?

Let me show you something that's easy to do.

Easy for you, but more difficult for me.
It looks complicated, but it's easy as can be.
How easy is that?

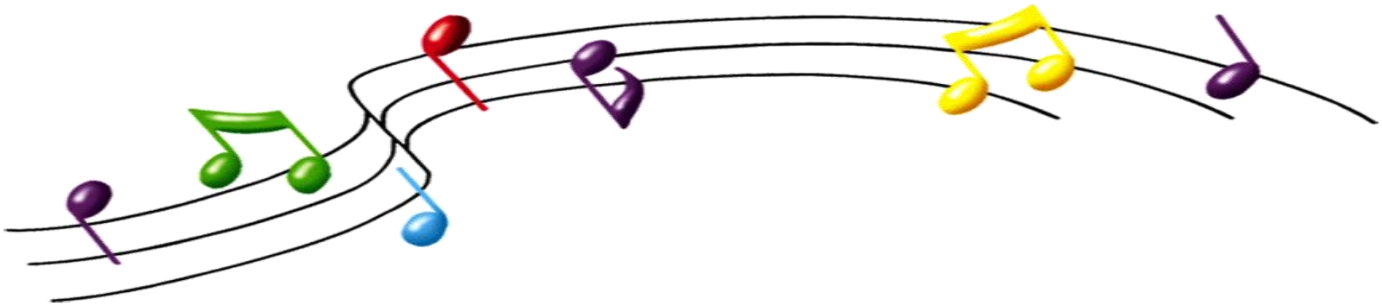
When you've got LIKE fractions, how do you know?
They have the same denominator down below.

To add LIKE fractions and get the right sum,
You just add the numerators;
Keep the same denominator down below.
So, two fifths plus two fifths equals four fifths.
Add two plus two-easy to do.
How easy is that?

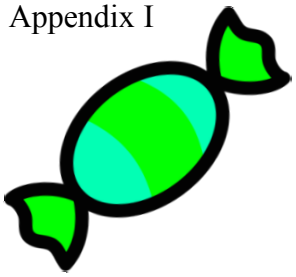
To subtract LIKE fractions and get the right difference,
You subtract the numerators,
Keep the same denominator down below.
So, three fourths minus two fourths equals one fourth.
Three minus two-easy to do.
How easy is that?

Easy for you, and now it's easy for me.
It looks complicated, but it's easy as can be.
How easy is that?

http://www.harcourtschool.com/jingles/jingles_all/35how_easy_is_that.html

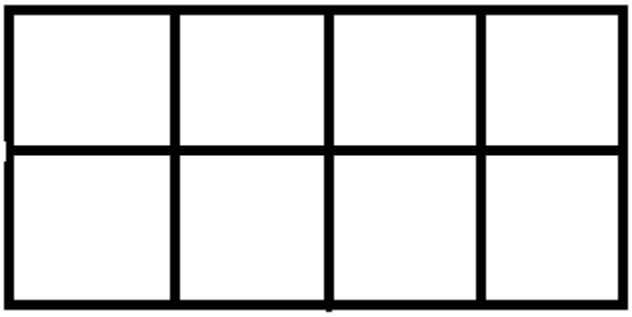


Appendix I



Miss Rizzo's Candy Company

Use crayons to shade in the 8 piece Special Bar that you created:



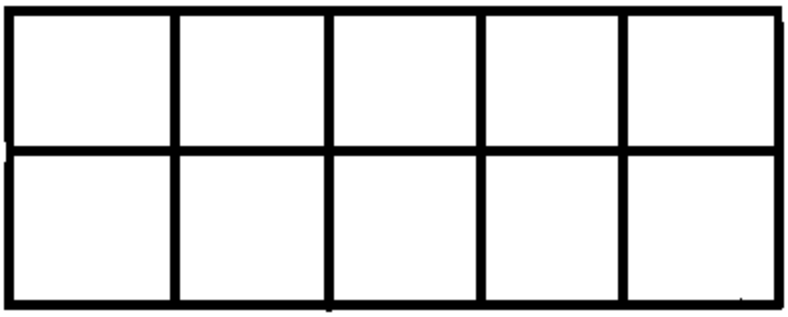
My Special Bar is:

Fraction	Flavor

The equation for my Special Bar is:

_____= one whole candy bar

Use crayons to shade in the 10 piece Special Bar that you created:

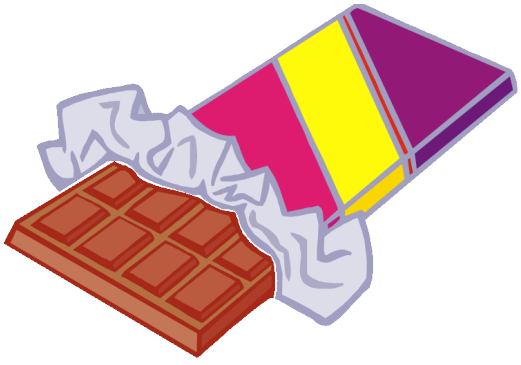


My Special Bar is:

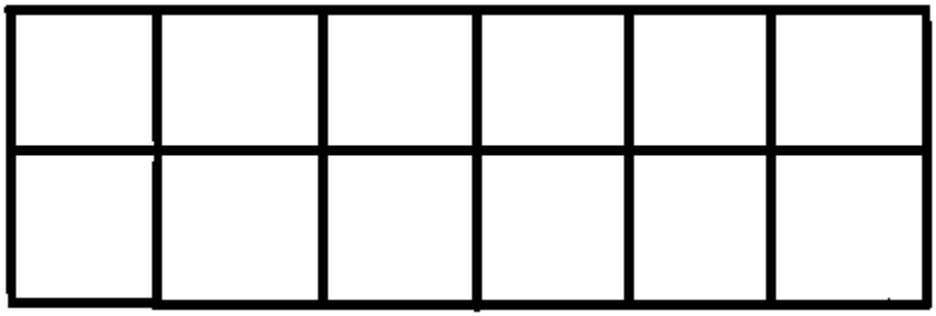
Fraction	Flavor

The equation for my Special Bar is:

_____= one whole candy bar



Use crayons to shade in the 12 piece Special Bar that you created:



My Special Bar is:

Fraction	Flavor

The equation for my Special Bar is:

_____= one whole candy bar

Special Bar Story Problem

Draw and color your favorite Special Bar below:

Now write your own story problem using your favorite Special Bar below:

_____

_____

_____

_____

_____

_____

_____

Have your partner solve the story problem- show your work and write the answer

Answer: _____

Appendix J

ⓢⓚⓘⓣⓣⓛⓔⓢ Ⓕⓡⓐⓒⓣⓘⓞⓝ ⓒⓗⓐⓛⓛⓔⓝⓖⓔ!

Directions: Open your bag of Skittles and answer the following questions. DO NOT EAT YOUR SKITTLES UNTIL YOU HAVE COMPLETED THIS ACTIVITY! ☺

How many Skittles are in the "whole" bag? _____
What fraction of your Skittles are red? _____
What fraction of your Skittles are green? _____
What fraction of your Skittles are yellow? _____
What fraction of your Skittles are orange? _____
What fraction of your Skittles are purple? _____

What fraction of your Skittles are NOT orange? _____
What fraction of your Skittles are brown? _____
What fraction of your Skittles are yellow and orange? _____

Think about a bag of 20 Skittles.
How much would $\frac{1}{2}$ of the bag be? _____
How many Skittles would $\frac{1}{4}$ of the bag be? _____
How many would $\frac{3}{4}$ of the bad be? _____
How many would 1/10 of the bag be? _____

What if the bag had 25 Skittles…
How much would 1/5 of the bag be? _____
What about 2/5? _____
What about 3/5? _____

What would be more?
(Circle the greater amount)

½ of a bag of 14 Skittles or 1/3 of a bag of 18 Skittles?

1/4 of a bag of 20 Skittles or 1/3 of a bag of 18 Skittles?

1/6 of a bag of 24 Skittles or 1/4 of a bag of 16 Skittles?

½ of a bag of 30 Skittles or 2/3 of a bag of 18 Skittles?

3/4 of a bag of 16 Skittles or 2/3 of a bag of 15 Skittles?

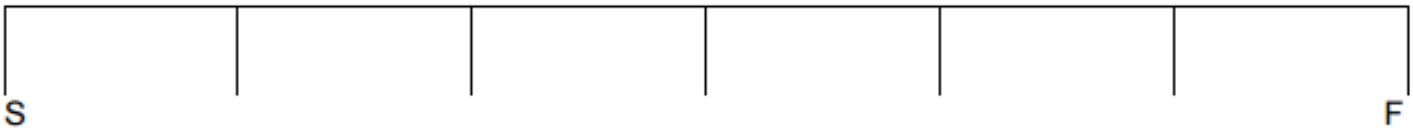
½ of a bag of 90 Skittles or 4/5 of a bag of 50 Skittles?

1/10 of a bag of 100 Skittles or 1/7 of a bag of 63 Skittles?

Try writing three of your own!

Appendix K

Race 1



This race has 6 different sections to run. What are some possibilities that your team can run?

Runner 1	Runner 2	Runner 3	Equation

Which one of your options is your favorite one? Explain why.

Race 2

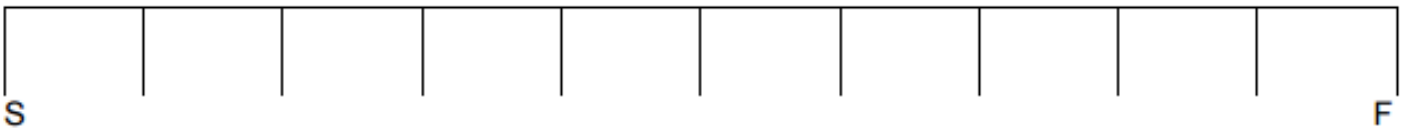
S F

This race has 4 different sections to run. What are some possibilities that your team can run?

Runner 1	Runner 2	Runner 3	Equation

Which one of your options is your favorite one? Explain why.

Race 3

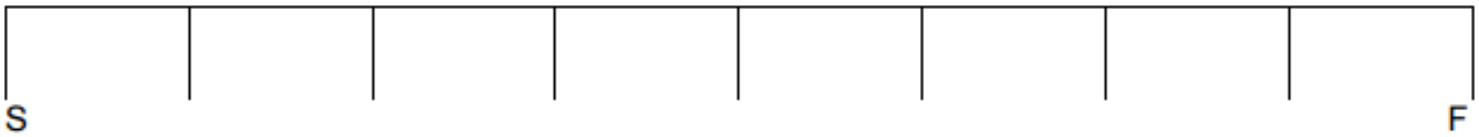


This race has 10 different sections to run. What are some possibilities that your team can run?

Runner 1	Runner 2	Runner 3	Equation

Which one of your options is your favorite one? Explain why.

Race 4



This race has 8 different sections to run. What are some possibilities that your team can run?

Runner 1	Runner 2	Runner 3	Equation

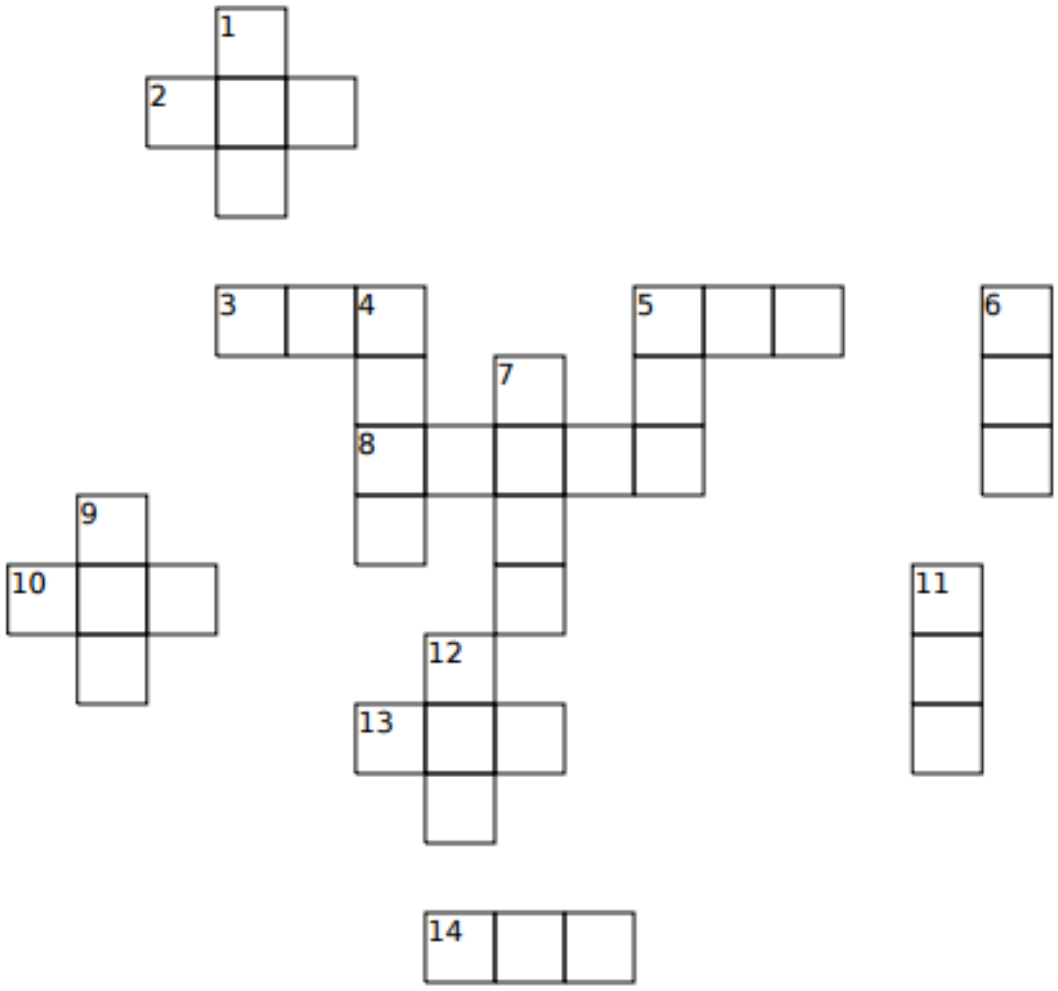
Which one of your options is your favorite one? Explain why.

Appendix L

Adding Fractions

©Sara Oberheide

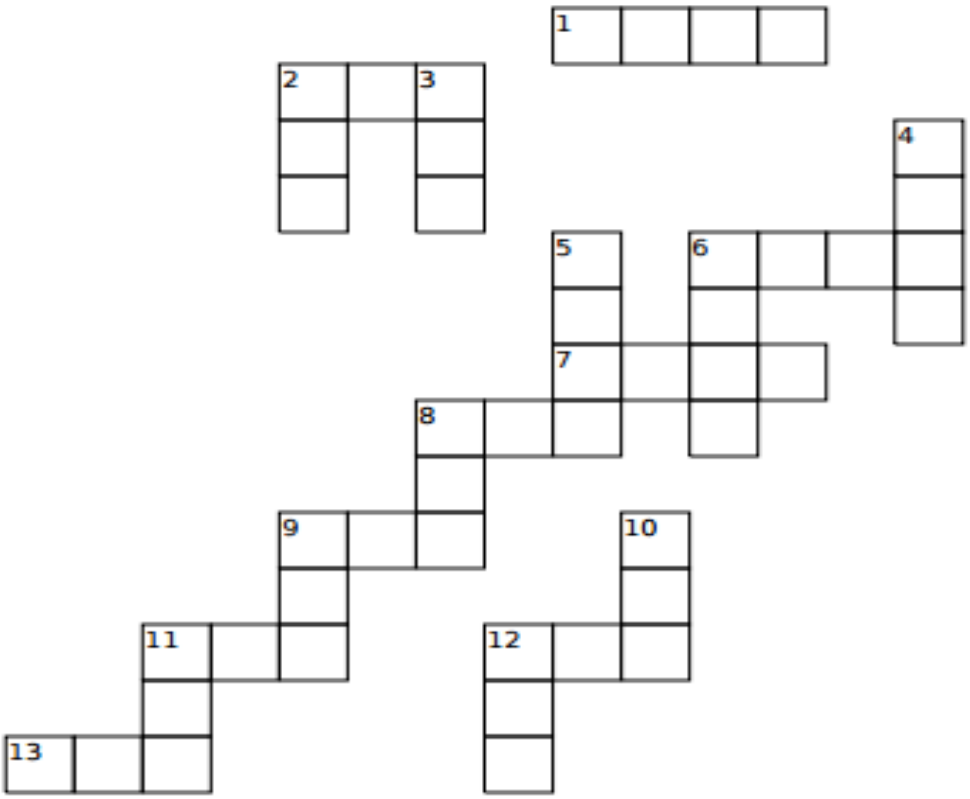
Add the fractions below and put the sum into the puzzle. For example; 2/5 + 2/5 = 4/5. Then, you will place 4/5 in the puzzle. The slash will be a space in the puzzle.



Across	
2	3/7 + 2/7
3	2/8 + 1/8
5	3/9 + 1/9
8	8/15 + 4/15
10	5/8 + 3/8
13	1/4 + 1/4
14	2/4 + 1/4

Down	
1	4/9 + 1/9
4	2/12 + 6/12
5	1/5 + 3/5
6	1/8 + 5/8
7	2/10 + 6/10
9	6/9 + 2/9
11	1/6 + 4/6
12	1/3 + 1/3

Subtracting Fractions



Across

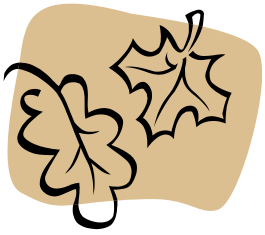
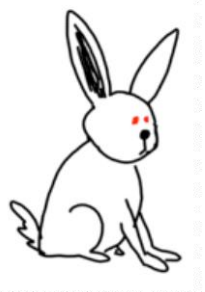
1 28/30 - 7/30 =
2 8/15 - 5/15 =
6 18/22 - 12/22 =
7 7/10 - 6/10 =
8 7/8 - 3/8 =
9 8/9 - 2/9 =
11 12/14 - 6/14 =
12 5/5 - 2/5 =
13 6/7 - 2/7 =
14 3/4 - 2/4 =

Down

2 5/9 - 4/9 =
3 14/14 - 4/14 =
4 10/13 - 4/13 =
5 10/12 - 5/12 =
6 4/10 - 1/10 =
8 3/6 - 1/6 =
9 12/14 - 8/14 =
10 14/15 - 2/15 =
11 6/7 - 3/7 =
12 5/8 - 2/8 =

Appendix M

Fraction Nature Walk

	What did you see? (10)	Fractions & Equation	Decimals
Leaves 			
Flowers/ Plants 			
Animals/ Insects 			

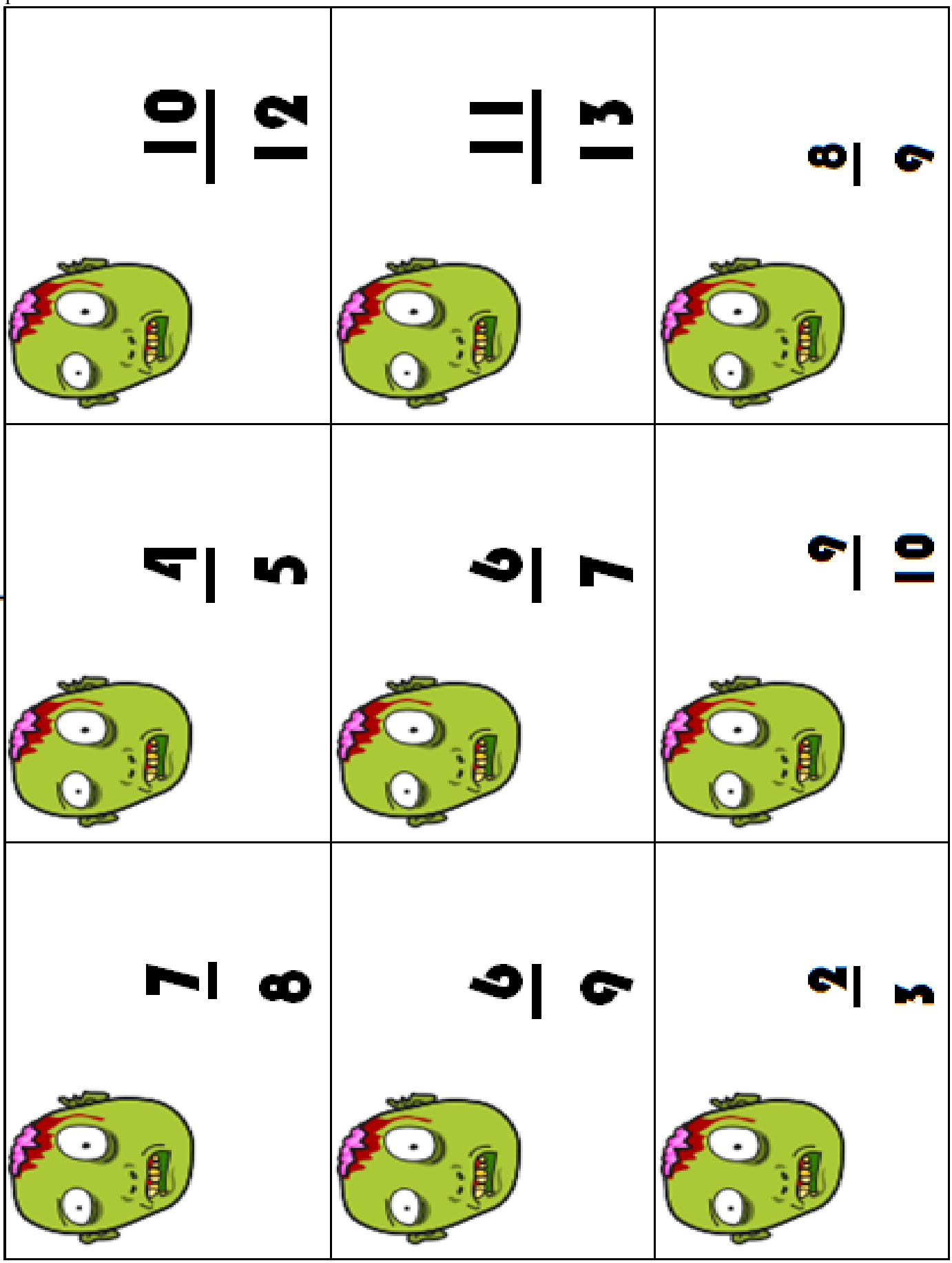
Appendix N

Fractions & Decimals

Directions: Fill in the correct decimal or fraction based off what is given.

Decimal	Fraction
	$\frac{3}{10}$
	$\frac{2}{5}$
	$\frac{1}{4}$
	$\frac{10}{100}$
	$\frac{90}{100}$
.30	
.75	
.80	
.50	
.60	

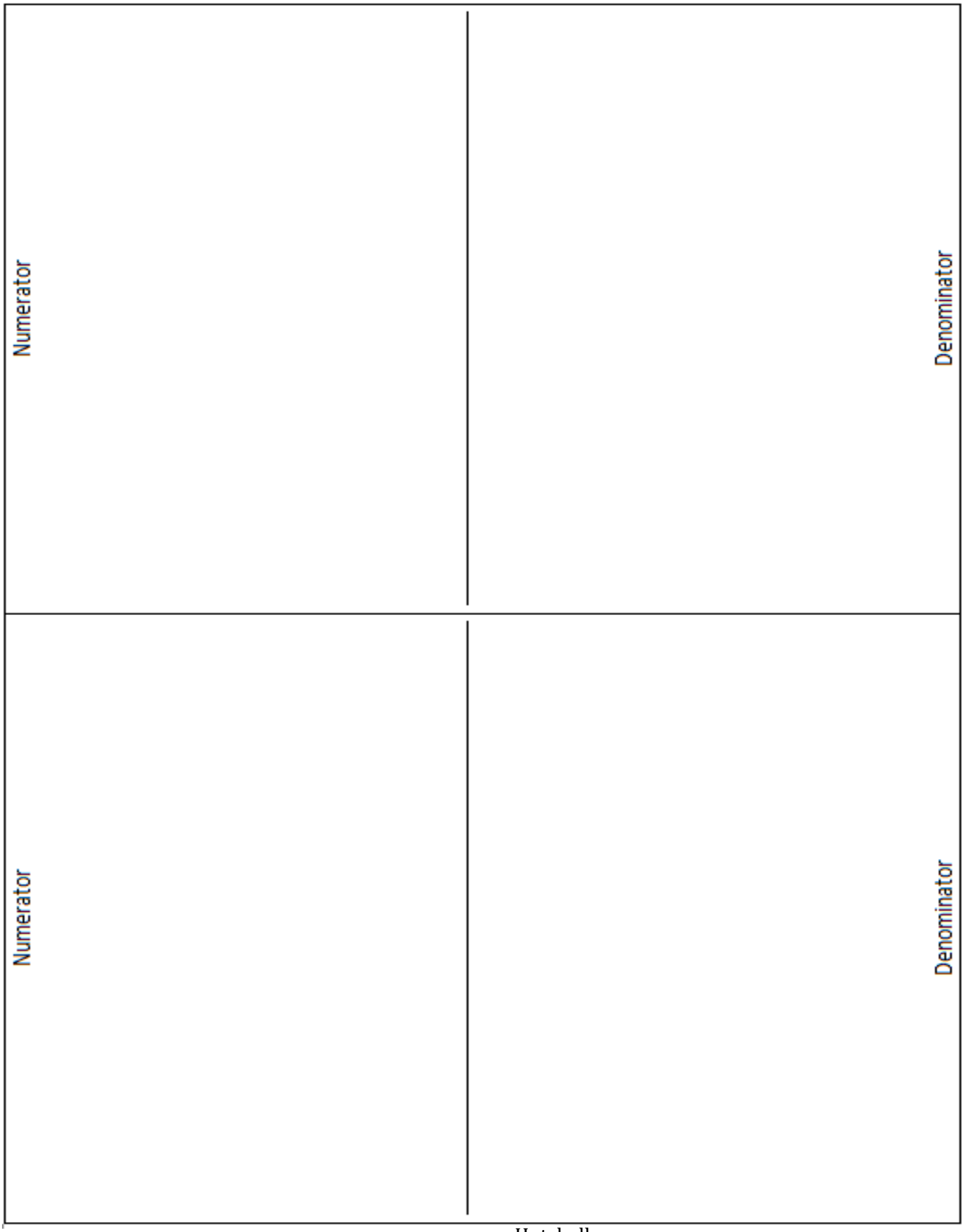
Cut and laminate these cards to use with the Zombie Fractions Decomposition center.



Zombie Fractions Answer Sheet

 Starting Fraction:	 Decomposed Fraction:
 Starting Fraction:	 Decomposed Fraction:
 Starting Fraction:	 Decomposed Fraction:

Appendix P



Hotchalk.com
Fraction Card Comparison Gameboard

Appendix Q

Hotchalk.com Fraction Bootcamp-Fraction Cards

Cut out these cards and laminate them to use with the fraction boot camp centers.

Kayla is making cookies. The recipe requires $\frac{3}{4}$ cup of sugar. She wants to make 3 batches of cookies. How many cups of sugar must she use?	Shawna has a cheesecake sampler. There are 12 pieces. Of those pieces, 2 are chocolate chip, 4 are blueberry, 5 are regular, and 1 is raspberry. What fraction of the cheesecake sampler is fruit flavored?
Kyle orders a large pizza that has 9 pieces. He eats 2 pieces and gives 3 to Juan. What fraction do Kyle and Juan eat? What fraction of the pizza is left?	Mia counts 20 girls on the beach. 4 have purple flip flops on. 8 have yellow flip flops on. 6 have black flip flops and the rest are barefoot. What fraction of the girls are wearing flip flops? What fraction are barefoot?
Jorge has 30 shirts. 3 are red. 10 are blue. 6 are yellow. 5 are orange. The rest are black. What fraction are either red or orange? What fraction are black?	Diego has 18 Skittles. 6 are red, 3 are yellow, 4 are green, and 5 are purple. What fraction of the Skittles are primary colors? What fraction are secondary colors? What fraction are not purple?

 1/2	 1/3	 1/4	 1/5
 1/6	 1/7	 1/8	 2/3
 3/4	 4/5	 5/6	 7/8

 2 / 4	 2 / 6	 2 / 8	 2 / 10
 2 / 12	 2 / 14	 2 / 16	 4 / 6
 6 / 8	 8 / 10	 10 / 12	 14 / 16