Summer Math 2019

Grades 3-4 

MASTER Copy

These page numbers below are only the computer numbering, for previewing the file on the computer. The numbers printed on the pages reflect the page order within the individual sections. Each section restarts with page number 1.

Summer Math Grade(s) Completed: 3-4 Educator Guide for Units 1-5

Suggested Paper Color Code: Green Math Matters Code for Grade Band: Whale Icon

Summer Math Objectives: To review and reinforce the following Grade 3 skills.

Math Fluency for Third Grade:

- **NY-3.OA.7a -** Fluently solve single-digit multiplication and related divisions, using strategies such as the relationship between multiplication and division or properties of operations. e.g., Knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8**.**
- **NY-3.OA.7b** - Know from memory all products of two one-digit number.

Major Work for Third Grade: Multiplication and division of whole numbers and fractions – concepts, skills and problem solving.

NY-3.OA.4 – Determine the unknown whole number in a multiplication or division equation relating three whole numbers. e.g., determine the unknown number that makes the equation true in each of the equations 8 x ? = 48, 5 = __ ÷ 3, 6 x 6 = ?

NY-3.OA.1 – Interpret products of whole numbers. e.g., Interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. Describe a context in which a total number of objects can be expressed as 5 × 7.

NY-3.OA.3 – Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. E.g., using drawings and equations with a symbol for the unknown number to represent the problem.

Note: This Next Generation standard uses a word problem chart in the CGI format, with one row for "Equal Groups" and a second row for "Arrays & Area."

NY-3.NF.3 - Explain equivalence of fractions and compare fractions by reasoning about their size.

NY-3.NF.3b – Recognize and generate equivalent fractions. e.g., 1/2 = 2/4; 4/6 = 2/3
Explain why the fractions are equivalent.

NY-3.NF.3d – Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons rely on the two fractions referring to the same whole. Record the results of comparisons with the symbols >, =, <, and justify the conclusions, e.g., by using a visual fraction model.

Summer Math Objectives: To review and reinforce the following Grade 4 skills.

NY-4.NF.6- Use decimal notation for fractions with denominators 10 or 100.
e.g.,
• Rewrite 0.62 as 62/100 or 62/100 as 0.62.
• Describe a length as 0.62 meters.
• Locate 0.62 on a number line.

NYS Note: This is a Power Standard for Grade 4, but scheduled after the NYS Math Assessment, so is new to students.

Major Work for Grade 4: Multiplication and division of whole numbers and fractions – concepts, skills and problem solving.

NY-4.NBT.5 – 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.

NY-4. NF.7 – Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, <, and justify the conclusions, e.g., by using a visual model.

NYS Note: This is a Power Standard for Grade 4, but scheduled after the NYS Math Assessment, so is new to students.

NY-4. NF.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 ½. 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.

NY-4.MD.4 – Make a line plot to display a data set of measurements in fractions of a unit (1/2, ¼, 1/8). Solve problems involving addition and subtraction of fractions by using information present in line plots.

Educator Packets (one per unit):

- ***Target Number*** directions and bull's eye with numbers to select *(need a timer)*
- ***Family Fun*** Game Directions and Answer Key
- ***CGI*** Directions and Word Problems for grade band *(English and Spanish)*
- ***Snack Fraction*** of the week directions *(need: paper plate, napkin, plastic knife, snack of the week or substitute)*

Student Packets Bilingual English-Spanish (one per unit):

- ***Target Number*** bull's eye
- ***Family Fun*** cards for grade band
- ***CGI*** Graphic Organizer
- ***Snack Fraction*** Record Sheet
- ***Family Fun*** Game Board and "DIY" Game Pieces

Printing Note: Use a different color to print the packets for each grade level. This makes it easier for students in different grade bands to work together. Packets can be print two-sided.

Organization: Each Grade Band has the same four activities, organized in the same order, for each Unit. Students can do the same activity, but use the problems from their own packet.

In-Home Time Management: Students can work together on the Target Number and Family Fun Game. Students use the game cards from their separate Student Packets. The CGI word problems and Snack Fractions,

however, often require more focused attention to the individual grade bands.

Summer School Time Management:

1. Warm up each day with Target Number.
2. Create a Daily Routine with the Family Fun game cards. Each row provides practice for different math skills. Select one card from each row. Pose the problems to students. Have the students fold paper into fourths, and then use each fourth to solve the problem and hold up for you to check. Use three to four each day. (Differentiate for students in different grade bands, so everyone is solving problems, but different problems.)
3. Use the full Cognitive Guided Instruction protocol for the CGI word problems, two times a week.
    a. All students work on the same problem.
    b. Teacher walks between students, quietly asking individuals to explain the strategy/process they are using. This gives students a chance to self-correct.
    c. When most are done, ask two to three volunteers to share their process. First, they draw on the board, and then they explain.
    d. As the instructor, you are looking for students who use different strategies (i.e. drawing pictures, using tallies, adding on, etc.)
    e. Eventually, use this time for a class discussion about strategies that take more time or less time.
4. Let students play the actual Family Fun game at least once a week.
5. Utilize the extra teaching lessons posted on the website for this grade to fill gaps in learning.
6. Summer School Instructors can bring in extra activities to support the student practice in their math fluency and major works.

GETTING STARTED:

Distribute Student Packets so each student receives the grade band for the grade they completed in June. The packets have a symbol instead of the grade number so Educators can differentiate the math level for students as appropriate.

WARM UP: TARGET NUMBER Directions

The Educator gives students one number. Students have one minutes to write down as many different ways to represent the number. Everyone takes turns sharing what he or she wrote.

Key Points:

- Students are able to write solutions from their own math knowledge.

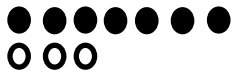
- Educators can work in examples related to the student's required math fluency and major works in math.
- The goal is for students to find ***multiple and different (correct) responses*** rather than limiting students to one correct strategy.

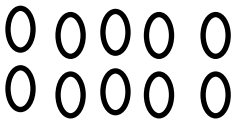
Process:

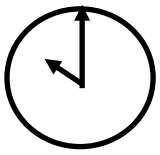
1. Select the Target Number for today. Students can write the number on their Bull's Eye.
    a. All target numbers are fair to use with students in grades 1 through 8. All ages can start with the numbers 12 and 15. After these, you will need to give students in grades 1 to 8 the higher numbers, and use numbers 20 and under for any Kindergarten (rising First Grade) students in the group.
2. The task is to represent the target number in different ways in one minute. Do a couple samples with students before starting the timer.
3. Set the timer for one minute.
4. Educators play along, and write examples to share related to the students' required math fluencies:
5. At the end of the minute, students give ONE example at a time, going around the group a couple of times until all DIFFERENT responses are used. Students need to give **different** ways to represent the number. Writing, "7 + 3" is different from writing, "3 + 7". Drawing 7 circles and 3 circles is different from writing, "7 + 3."

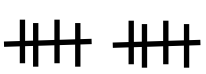
Examples of some different ways to represent the number 10:

7 + 3	10 + 0	17 – 7	2 x 5	100 / 10
3 + 7	0 + 0	ten	5 x 2	10/1









One dozen eggs minus 2 | 2 + 2 + 2 + 2 + 2 | 100 - 90

FAMILY FUN GAME

All ages of students play the game together. On their turn, students use the game cards from their own packet to solve math problems at their own level.

Key Points:

- Unit 1 introduces the game and some of the Math Matters skills.
- Units 2 through 5 provide students practice all of the core math skills, except fractions, throughout the summer.

Process:

1. Each Student Packet has its own Family Fun Game Cards, allowing each student to participate together with students who have different skills to practice.
2. Do not cut the cards apart to play the game. Starting with Lesson 2, the three cards in each row will usually practice the same skill.
3. Instead of students drawing a card, students select a problem from their packets. Students can select problems in the order they choose, BUT ask students to solve one problem from each row, before repeating from the row, so they practice each skill.
    a. Many students will read ahead, solving problems, to find the "easiest" ones while waiting for their next turn.
4. Game Directions are on the game board. Game boards are at the end of each Student Packet, so they are easy to pull off and use.
5. The best way to move around the board is to use dice. The Student Packets have a "Do It Yourself (DIY)" version to toss a small wad of paper onto a board of numbers.

CGI CHARTS

CGI is the **C**ognitive **G**uided **I**nstruction for primary students to solve math word problems. With a few changes, this chart is in New York State's Next Generations Learning Standards for Grade 3 and Grade 4 for use with multiplication and division word problems involving Equal Groups and Arrays and Area Problems.

Key Points:

- In the Educator Packets, the multiplication/division terms on the (English) CGI Chart have been updated to represent the Next Generation terminology changes.
    - The "Compare" row of addition/subtraction problems remains for use to practice addition and subtraction during the summer.
- The CGI process allows students to solve the problem in a way they understand, instead of the "right" way.
- Provides the Educator insight about the student's math knowledge.
- Asks students to explain their solution process before asking for an answer.
- When there is a group of peers, the emphasis is on finding different solution paths, rather than one correct method.
- Eventually this can lead to a real discussion: Does a student's method work for him or her? Has the student seen another method they are ready to try?

Process:

1. ***Select one word problem.*** The easiest wording to understand is in the top, left corner of the CGI Chart. The wording is more difficult as you move left and down.
    a. Start students with the simplest word problems.

b. If a student struggles, stick with these for the summer so the student becomes secure. If students are confident, move to questions to the left, or down, to increase their understanding.
c. FYI -The word problems with a STAR on the CGI Chart are the problem-types targeted on the Grade 3 Assessment. ★ The word problems with a TRIANGLE are targeted on the Grade 4 Assessment. ▲

2. Have manipulatives and paper/pencil available for students to choose either medium for solving the problem.
3. ***Read the problem to students once***. **Note:** Each problem has three sets of numbers for you to choose from to fill in the blanks. Use the set that works best for the student(s).
4. ***Use the Graphic Organizer*** to help students organize their notes and strategies.
5. ***Read the problem again, and then teach students to take notes.*** (As students demonstrate confidence, shift to giving students a chance to take their own notes.)
    a. Prompt students with questions, and model writing notes. Use the Graphic Organizer.
    b. Sample questions: What does the problem tell us first? *[Carlos had 4 sets of pennies]* How can we write? *[C = 4 sets (or a drawing)]*
    c. What happens next? *[There are 6 pennies in each set.]* How can we write? *[set = 6 pennies]*
    d. What question do we have to answer? *[How many pennies did he have in all?]* How can we write this? *[How many pennies?]*
6. Give students time to solve. *(If struggling, prompt with, "What number does the problem start with?" Do you want to draw this or use manipulatives to recreate it? Then what happens?)*
7. Ask students to explain their process before asking them for an answer. This allows students time to self-correct and gives the Educator a clue about how the student is thinking.
8. At the end, look at the final answer together, to decide if it solves the problem. How would you say the answer in a sentence? *[Carlos has 24 pennies in all.]*

Summer School Note: How to extend this to the full CGI process.
Walk around the group, quietly asking individuals to explain their process to you. When students seem stuck, prompt by re-asking them about their notes.

Take time to ask two to three volunteers to copy their process on a white board or large piece of construction paper. Then ask the students to explain their procedures. When selecting volunteers, it is a good idea to look for different strategies that are successful, not just the "best" method. The variety of examples and explanations will give all students a stronger understanding about math works.

Planning Note: In the original design, the word problems in the CGI Chart used the characters and events from one particular book, listed at the top of the chart. The class spent three days rereading and using the characters and plot from the one book.
While not as rich an experience for students who are not immersed in the particular story, the word problems still serve as good examples for the variety of one-step word problems.

SNACK FRACTIONS

Students separate a snack into a fractional portion. Then eat.

Key Points:

- Equal portions matter when sharing real food
- All students use the same snack food
- Using the record sheet helps students transfer from the real to the symbolic

The Math Matters In-Home curriculum uses the following snacks:

- Unit 1 = String Cheese
- Unit 2 = Cup of Trail Mix
- Unit 3 = 6 pieces Beef Jerky
- Unit 4 = 100 calorie snack bags
- Unit 5 = 4 Graham Crackers and Nutella

Planning Note: Substitute snacks as needed to travel in cars and to fit the budget. If possible, have the substitute snack match the shape or number of the original, so the Fraction Record sheet still makes sense. For example, substituting something rectangular, like a breakfast bar, for the string cheese, or substituting a package with 6 cheese cracker sandwiches for the 6 pieces of beef jerky.

Summer School Note: The original Math Matters Summer School curriculum suggested the following snacks:

- Unit 1 = Apple, ice cream sandwich, string cheese
- Unit 2 = Guacamole and carrots, trail mix, cherry tomatoes and cheese
- Unit 3 = Dill pickle, beef jerky, raisin bread and banana
- Unit 4 = Fruit kabob, 100 calorie snack bag, graham cracker and peanut butter (check for allergies to peanut butter)
- Unit 5 = Laughing Cow cheese wedges, graham crackers and Nutella and strawberries (check for allergies to Nutella), bagels and cream cheese
- Unit 6 = Turkey wrap, personal pan pizza

Process:

- ***Use the Snack Fraction guidance*** in the Teacher Packet and Snack Fraction Record sheet in the Student Packet

Alternative Process:

- ***Single student:*** splits the food in the fractional amount practicing (half, fourth, third, etc.) and Migrant Educator discusses with student – are they fair shares? Are some portions larger/smaller? Have the student draw and write the fractional portion of a whole.
- ***Partners:*** each has whole food. Each splits the food in the fractional amount practicing (half, fourth, third, etc.) but the partner picks the portion (half, 2/4, 3/6) first. Have the students draw and write the fractional portion of a whole.

Recipe Note:
Trail Mix: (mix equal parts of each of the following)

- Peanuts, M&M's, Fish crackers (check for allergies to peanuts); or
- Chex Corn Cereal, Cheerios, dried fruit

(Optional) SUMMER ASSESSMENTS

Formal Summer Assessments

The formal Summer Assessments are based on the grade that a student completed. A student who completed Second Grade in June, but might be considered a (rising) Third Grader in the summer, should take the Summer Assessments for Grade 2. The questions are based on end-of-year mastery to maintain core math skills over the summer.

Note: Grades 3 and 4 receive the instruction together, but the students are assessed with different a pre-/post-tests. Each has different supplies to support the student.

- **Grade 3** uses a single whale-icon to code the papers students can see.
  - ***No extra supplies suggested for Grade 3.***
- **Grade 4** uses two whale-icons to code the papers students can see.
  - ***Extra Supplies: Base 10 blocks are recommended for Grade 4 students to be able to use.***

Next Generation Modifications: These assessments started as the Math Matters pre-tests and post-tests in English and Spanish. The assessments are now modified to align with the *New York State Next Generation Mathematics Learning Standards.*

- In the Grade 3 (one whale-icon) Assessments, the Summer Math version was reformatted for better readability.
- In the Grade 4 (two whale-icon) Assessments, the Summer Math materials are substantially changed as follows:

- comparing two decimals at a time, instead of the three or more used by Math Matters;
- comparing two fractions at a time instead of the three mixed fractions used by Math Matters;
- plotting fractions (1/2, ¼, 1/8) on a number line instead of the mix of decimals and fractions used by Math Matters;
- removed the non-grade-4 question to read decimals in expanded format; and
- added a multiplication word problem.

Informal Assessments

Educators can observe if a student is able to complete the problems or not. When gaps in knowledge are observed, Educators can re-teach to those skills, to close the gaps in learning. When a student can complete a skill on his or her own, it is important for the student to continue practicing the skill in order to avoid summer loss.

CLOSING THE GAPS

Use this section for ideas when a student struggles with a particular skill.

Get curious and ask yourself:

- *Does the student just need a reminder and more practice?*
- *Does the student need a full lesson to re-introduce the skill?*
- *Does the student need to use simpler numbers, or start with a simpler skill?*

Options for closing the gaps:

- Plan to utilize your own examples during next week's "Target Number" to support this skill. At the beginning of Family Fun, use one of the game's examples to review the skill before playing the game.
- Review the Skill Lessons posted on the website for this grade band, to teach/ reteach the Summer Math skill.

Math Matters Note: These lessons were written for a classroom, and are called "TV Lessons" because they were also scripts and videotaped during Math Matters. For example, each lesson has a speaking part for a "pirate" character. You will need to preview the following lessons so you can adapt the script to your students and situation.

NY-3.OA.3 – Introduction to Using Array for Multiplication with one-digit numbers

- Supplies for each Student
  - 1 piece of construction paper
  - 6 portion cups

- 30 counters (lesson uses 30 units from a base ten set)
- Use construction paper to draw the rest of arrays

NY-3.OA.7a – Using Fact Families and Area Models to Represent Figure out Division

- Lesson asks students to look at a word wall and vocabulary word "division." You can modify to tell students the lesson will work with division.
- Supplies for each Student
  - 1 copy of the graph paper in the lesson

NY-4.NBT.5 – Introduction to Building Array of Two-Digit Numbers using Base 10 Blocks

- This is the math behind the short cuts to multiplying two-digit numbers.
- Supplies for each Student
  - Base Ten – (1) hundred flat
  - Base Ten – (10) tens
  - Base Ten – (20) units
  - (can substitute with graph paper and colored pencils)

NY-4.NBT.5 – More Practice Building Arrays of Two-Digit Numbers using Base 10 Blocks

- The lesson shows the connection between the model and multiplying the numbers.
- Supplies for each Student
  - Base Ten – (1) hundred flat
  - Base Ten – (13) tens
  - Base Ten – (41) units
  - Graph Paper
  - (can substitute using graph paper and colored pencils for the Base Ten blocks)

NYS Next Generation Expectations for Grade 3 and Grade 4
Multiplication and Division

	Unknown Product	Group Size Unknown ("How many in each group?" Division)	Number of Groups Unknown ("How many groups?" Division)
	$a \times b = ?$	$a \times ? = p$ and $p \div a = ?$	$? \times b = p$ and $p \div b = ?$
Equal Groups	There are a bags with b plums in each bag. How many plums are there in all? *Measurement example:* You need a lengths of string, each b inches long. How much string will you need altogether?	If p plums are shared equally into a bags, then how many plums will be in each bag? *Measurement example:* You have p inches of string, which you will cut into a equal pieces. How long will each piece of string be?	If p plums are to be packed b to a bag, then how many bags are needed? *Measurement example:* You have p inches of string, which you will cut into pieces that are b inches long. How many pieces of string will you have?
Arrays & Area	There are a rows of apples with b apples in each row. How many apples are there? *Area example*: What is the area of an a cm by b cm rectangle?	If p apples are arranged into a equal rows, how many apples will be in each row? *Area example*: A rectangle has area p square centimeters. If it is a cm long, what is its width?	If p apples are arranged into equal rows of b apples, how many rows will there be? *Area example*: A rectangle has area p square centimeters. If it is b cm wide, what is its length?

Array problems can also be stated in terms of columns, exchanging the order of a and b, so that the same array is described. For example: There are b columns of apples with a apples in each column. How many apples are there?

3rd Grade Pre-Test Teacher Scoring Instructions and Answer Key

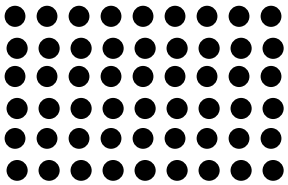
Note: ***"Strategy"*** refers to any method that could lead to the correct answer. Students may use a correct strategy and still get an incorrect answer.

Note: ***Writing labels*** is important to stress during instruction. However, for the purpose of this assessment, students do not lose credit when the label is missing.

<table>
<tr><th>Objective/Needs</th><th>Problems
Points</th></tr>
<tr><td>NY-3.OA.3 – Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.

1a–Award 1 point for a correct array

1b-Award 1 point if student writes all four number sentences of the fact family</td><td>1. Draw an array to model 6 x 9. You may draw this freehanded, or use the grid provided.

1a. Array: Student can draw an array or shade in the grid to represent 6 x 9. This array represents 6 rows by 9 columns. An array with 9 rows by 6 columns can be accepted.

Write the fact family for 6 x 9.

1b. Fact Family:
6 x 9 = 54 54 ÷9 = 6
9 x 6 = 54 54 ÷6 = 9
Number sentences can be in any order as long as all 4 are recorded.</td></tr>
<tr><td>NY-3.OA.4 – Determine the unknown whole number in a multiplication or division equation relating three whole numbers

2-Award 1 point for the correct answer</td><td>2.

48 ÷ 6 = 8</td></tr>
<tr><td>NY-3.OA.1 – Interpret products of whole numbers. e.g., Interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each.

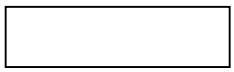
3-Award 1 point for the answer</td><td>3. Which picture below could be used to model 2 x 5?

ANSWER: B (2 groups of 5)

B  </td></tr>
</table>

Note: ***"Strategy"*** refers to any method that could lead to the correct answer. Students may use a correct strategy and still get an incorrect answer.

Note: ***Writing labels*** is important to stress during instruction. However, for the purpose of this assessment, students do not lose credit when the label is missing.

NY-3.OA.3 – Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. E.g., using drawings and equations with a symbol for the unknown number to represent the problem. **CGI** – Equal Groups *(Result Unknown or "a x b = ?")* **4a–Award 1 point** for the answer **4b–Award 1 point** for ***showing*** a reasonable strategy	**4.** Carlos caught 35 fish and wanted to freeze them in equal shares for 5 meals. If the fish are all about the same size, how many fish should he put in each freezer container? Show your strategy. **ANSWER: 7 fish.** **Strategy:** Students could draw a picture where 35 fish has been divided among 5 meals; they could skip count; they could use repeated subtraction; they could draw tally marks, they could use a division sentence. (5 x ___ = 35 or 35 ÷ 5 = ____)
NY-3.OA.3 – Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. **CGI** – Change Unknown or ("a x ? = p" or "p/a=?") **5a-Award 1 point for the answer** **5b-Award 1 point** for ***showing*** a reasonable strategy	**5.** Juanita was packing the 32 dolls in her doll collection. She wanted to pack only 8 dolls per box. How many boxes will she need? Show your strategy. **ANSWER: 4 boxes.** **Strategy:** Students could draw a picture where 32 dolls have been divided by groups of 8 to see how many boxes she needed; they could skip count; they could use repeated subtraction; they could draw tally marks, they could use a division sentence. (32 ÷ 8 = ___ or ___ x 8 = 32)
NY-3.NF.3b – Recognize and generate equivalent fractions. e.g., 1/2 = 2/4; 4/6 = 2/3 Explain why the fractions are equivalent.	**6.**  The model shows $\frac{1}{4}$.  **6a.** Use the second rectangle to model a different fraction equivalent to $\frac{1}{4}$. **6b.** Write the name of the other fraction equivalent $\frac{1}{4}$. _____

6–Award 1 point if the student does ***both parts correctly*****:** shows an equivalent fraction in the rectangle ***and*** writes the fraction name.

(#6 continued)

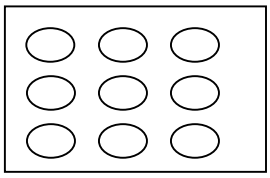
Answers: 6a. Students should use the blank rectangle to model (draw and shade) the equivalent fraction, as well as write the fraction.

6b. The written fraction could be in words, although most students will use the numeric form. For example, a possible answer would be 2/8 which could also be written acceptably as two eighths.

NY-3.OA.3 – Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. E.g., using drawings and equations with a symbol for the unknown number to represent the problem.

7–Award 1 point if the student has ***both*** the correct answer ***and*** shows a reasonable strategy

7. Karli is making batches of cookies on a small cookie sheet. If she bakes 4 pans just like the picture, how many cookies will she bake? Show your strategy**.**



ANSWER: 36 cookies.

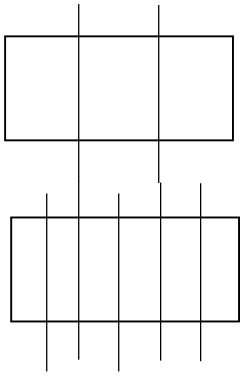
Strategy: Students could draw additional pans, use repeated addition; skip count, tally; use multiplication.
(4 x 9 = ____; 9 + 9 + 9 + 9 = ____)

NY-3.NF.3b – Recognize and generate equivalent fractions. e.g., 1/2 = 2/4; 4/6 = 2/3 Explain why the fractions are equivalent. **NY-3.NF.3d** – Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons rely on the two fractions referring to the same whole. Record the results of comparisons with the symbols >, =, <, and justify the conclusions, e.g., by using a visual fraction model.

8–Award 1 point if the student ***divides each*** rectangle appropriately, ***circles*** the larger fraction, ***and*** writes the fractions in the correct blank space.

8. a. Divide the cakes into the fractional parts.

of this cake



$\frac{1}{6}$ of this cake

8a.Divide: Students do not have rulers to be exact, but need to represent understanding.

8b.Circle: Students circle the fraction 1/3 or they can shade or circle 1/3 of the "cake."

8c.Compare: 1/3 > 1/6

b. Compare the fractions. $\frac{1}{3}$ or $\frac{1}{6}$?

Which fractional part is larger

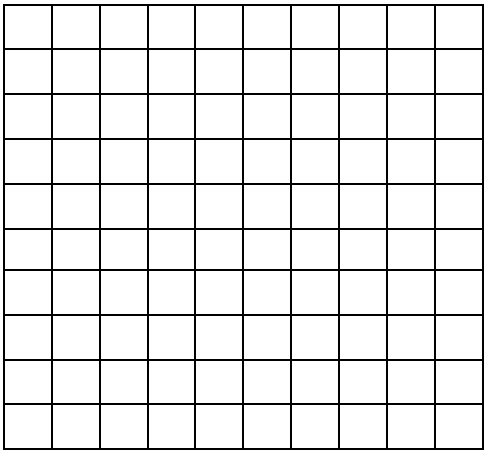
Circle the fractional portion on the picture that is larger.

c. Using the fractions above write the comparison statement.

$\frac{1}{3}$ _____ > _____ $\frac{1}{6}$

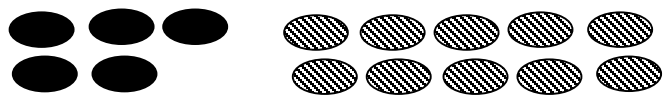
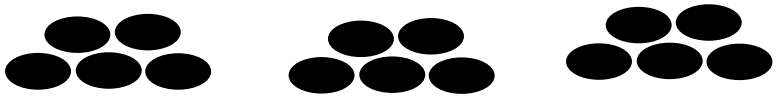
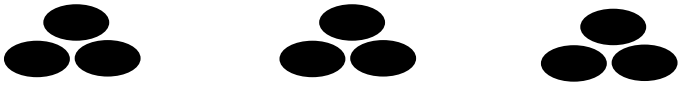
Pre -Test

Name_____

☐1a 1 Point Array ☐1b 1 Point Fact Family	**1a. Draw an *array* to model 6 x 9. You may draw this freehanded or use the grid provided.**  **1b. Write the fact family for 6x 9.**
☐**2** 1 Point	**2.** 48 ÷ ☐ = 8

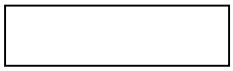
Pre -Test

Name_____

☐3 1 Point	**3. Which picture below could be used to model 2×5? Circle your answer choice.** **A**  **B**  **C**  **D** 
☐4a 1 Point Answer ☐4b 1 Point Strategy	**4. Carlos caught 35 fish and wanted to freeze them in equal shares for 5 meals. If the fish are all about the same size, how many fish should he put in each freezer container?** **Show your work.**

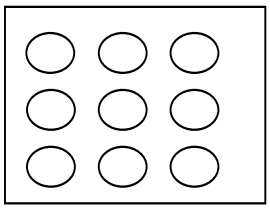
Pre -Test

Name_____

☐5a 1 Point Answer ☐5b 1 Point Strategy	**5. Juanita was packing the 32 dolls in her doll collection. She wanted to pack only 8 dolls per box. How many boxes will she need?** **Show your work.**
☐6 1 Point	**6.**  **The model shows $\frac{1}{4}$.**  **6a. Use the second rectangle to model a different fraction equivalent to $\frac{1}{4}$.** **6b. Write the name of the other fraction equivalent to $\frac{1}{4}$.** _____

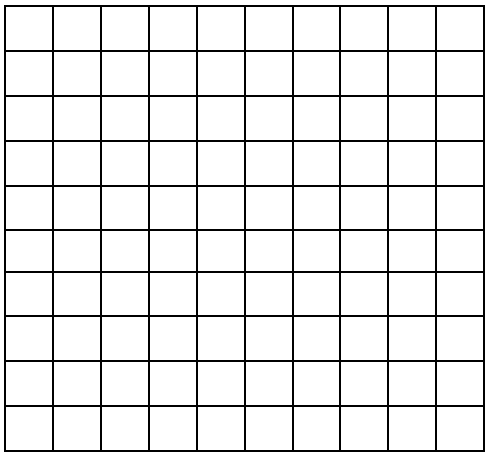
Pre -Test

Name_____

☐7 **1 Point**	**7. Karli is making batches of cookies on a small cookie sheet. If she bakes 4 pans just like the picture, how many cookies will she bake?** **Show your work.** 
☐8 **1 Point**	**8a. Divide the cakes into the fractional portions.** $\frac{1}{3}$ **of this cake**  $\frac{1}{6}$ **of this cake**  **8b. Compare the fractions.** **Which fractional part is larger** $\frac{1}{3}$ **or** $\frac{1}{6}$ **?** **Circle the fractional portion on the picture that is larger.** **8c. Using the fractions above write the comparison statement.** _____ > _____
_____/11 **total points**	

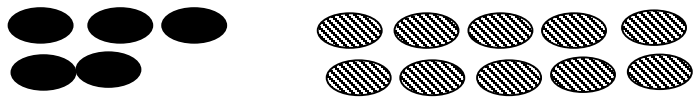
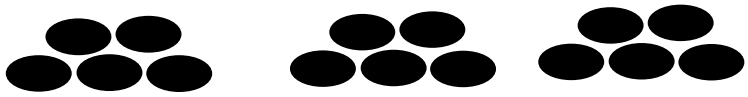
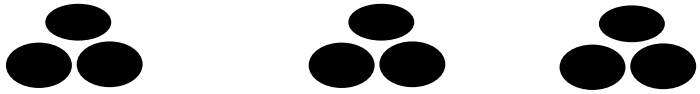
Pre-Test SPANISH

Name_____

☐1a 1 punto conjunto ☐1b 1 punto familia de hecho	**1a. Dibuja una matriz (array) que muestre 6×9. Puedes hacer un dibujo libre, o puedes utilizar la cuadrícula.**  **1b. Escribe la familia de hecho para 6×9.**
☐**2** **1 punto**	**2.** **48 ÷ ☐ = 8**

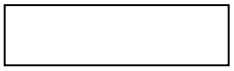
Pre-Test SPANISH

Name_____

☐3 1 punto	**3. ¿Cuál de los dibujos que ves a continuación puede utilizarse para modelar 2×5?** **Señala con un círculo tu respuesta.** **A**  **B**  **C**  **D** 
☐4a 1 punto respuesta	**4. Carlos pescó 35 peces y quería congelarlos en porciones iguales para 5 comidas. ¿Cuántos peces deberá poner en cada contenedor del congelador si los peces son todos más o menos del mismo tamaño?**
☐4b 1 punto estrategia	**Muestra tu trabajo.**

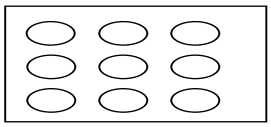
Pre-Test SPANISH

Name_____

☐5a 1 punto respuesta ☐5b 1 punto estrategia	**5. Juanita estaba guardando 32 muñecas de su colección.** **Quería guardar 8 muñecas en cada caja. ¿Cuántas cajas necesitará?** **Muestra tu trabajo.**
☐**6** **1 punto**	**6.**  **El modelo muestra $\frac{1}{4}$.**  **6a.Usa el segundo rectángulo para modelar otra fracción equivalente a $\frac{1}{4}$.** **6b. Escribe el nombre de la otra fracción equivalente a $\frac{1}{4}$.** **_____**

Pre-Test SPANISH

Name_____

☐7 **1 punto**	**7. Karli está preparando grupos de galletas en una bandeja.** **¿Cuántas galletas hará en total si prepara 4 bandejas como la del dibujo?** **Muestra tu trabajo.** 
☐8 **1 punto**	**8a. Divide los pasteles en las partes fraccionarias.** $\frac{1}{3}$ **de este pastel** ☐ $\frac{1}{6}$ **de este pastel** ☐ **8b. Compara las fracciones.** **¿ Qué parte fraccionaria es más grande,** $\frac{1}{3}$ o $\frac{1}{6}$ **?** **Marca la parte fraccionaria en el dibujo que es más grande.** **8c. Usando las fracciones arriba escribe la oración de comparación.** _____ > _____

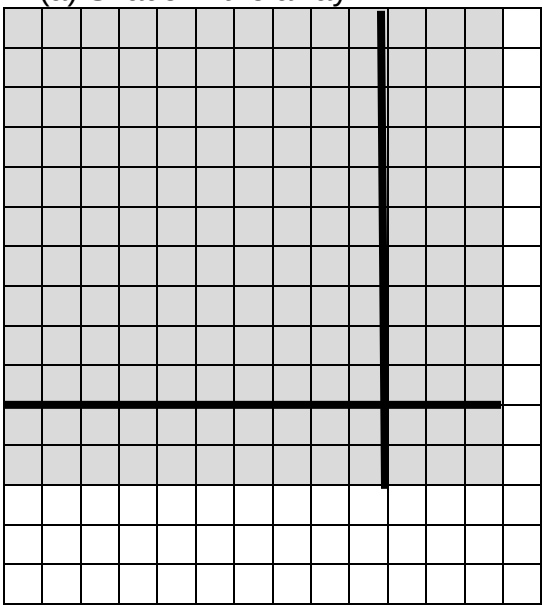
_____/
11 total points

Pre-/Post- Supplies

	Base Ten manipulatives suggested for students to have available to use. • Hundreds, tens, ones

4th Grade Pre-test Teacher Scoring Instructions and Answer Key

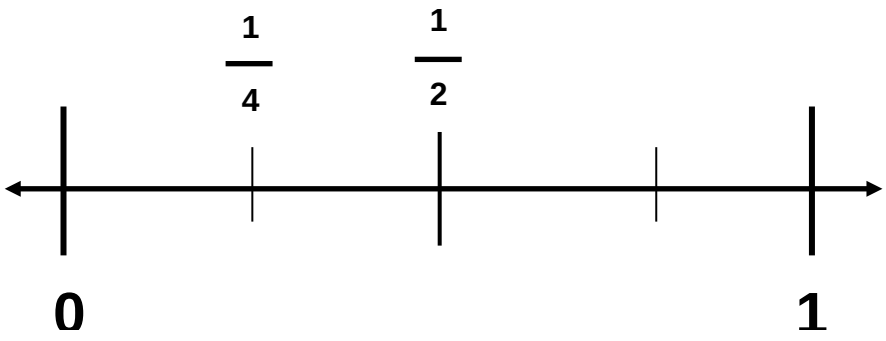
Note: *"Strategy"* refers to any method that could lead to the correct answer. Students may use a correct strategy and still get an incorrect answer.

	Problems-Solutions
NY-4. NF.6 **1a-Award 1 point** for the correct answer **1b-Award 1 point** for the correct answer	1. Write the following fractions as decimals. (a) $\frac{62}{100}$ = _____ (b) $\frac{7}{10}$ = _____ ***Answers:*** **(a) 0.62** **(b) = 0.7 (but 0.70 isn't wrong)**
NY-4.NBT.4 **NY-4.NBT.5** **2a-Award 1 point** for array **2b-Award 1 point** for correct answer **2c-Award 1 point** for showing a reasonable method	**2.** Represent 13 x 12 using an array. (a) Shade in the array.  ***Correct Responses:*** **(a) The array can be drawn to show 13 by 12 or 12 by 13.** **Note:** Students do not have to show the heavier lines for 10 x 10. They just help a student find and count the 100-block and the rows of ten. **(b) *Answer:* 156** **(c) Method Point: Give point for any reasonable method to find the product.**

4th Grade Pre-test Teacher Scoring Instructions and Answer Key

Note: *"Strategy"* refers to any method that could lead to the correct answer. Students may use a correct strategy and still get an incorrect answer.

Note: *Writing labels* is important to stress during instruction. However, for the purpose of this assessment, students do not lose credit when the label is missing.

NY-4. NF.7 **3-Award 1 point** for correct answer	**3.** Carolyn needs to walk another mile this week in order to meet here goal. Circle the longer trail: A. The Boulder Trail …….. 0.60 mile B. Five Falls Trail …….. 0.39 mile ***Answer:*** **A.** The Boulder Trail is longer. 0.60 mile is greater than 0.39 mile.
NY-4. NF.2 **4-Award 1 point** for correct answer	**4.** Marci has two recipes for biscuits. One recipe needs $\frac{1}{2}$ cup of buttermilk and another that needs $\frac{3}{4}$ cup of buttermilk. Using the fractions above, write the comparison sentence: _____ > _____ ***Answer:*** **3/4 > 1/2** Three fourths is greater than two fourths.
NY-4.MD.4 **5-Award 1 point** for correctly placing ***both*** fractions	**5.** Write these fractions on the number line. 

Note: *"Strategy"* refers to any method that could lead to the correct answer. Students may use a correct strategy and still get an incorrect answer.

Note: *Writing labels* is important to stress during instruction. However, for the purpose of this assessment, students do not lose credit when the label is missing.

<table>
<tr><td rowspan="3">NY-4.NBT.5

CGI-Equal Groups (Result Unknown or “a x b = ?”)

6a-Award 1 point for the correct answer

6b-Award 1 point for showing a reasonable strategy</td><td>6. There are 42 corn stalks in a row of corn. There are 16 ears of corn on one stalk. How many ears of corn in all?
Show your work.</td></tr>
<tr><td>Answer: 672 ears of corn

Strategy Point: Students may choose to use any reasonable strategy such as drawing a diagram, array, breaking apart, using a traditional algorithm (using numbers and a process), etc.
(42 x 16)</td></tr>
<tr><td></td></tr>
<tr><td>NY-4.NF.6

7-Award 1 point for having both answers correct</td><td>7.
 
(a) Write the fracton that would best represents the shaded portion of this bar.
_____

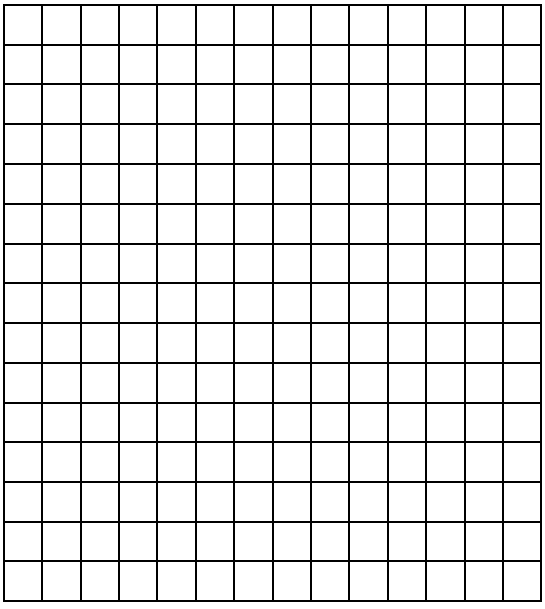
(b) Write the fraction as a decimal. _____

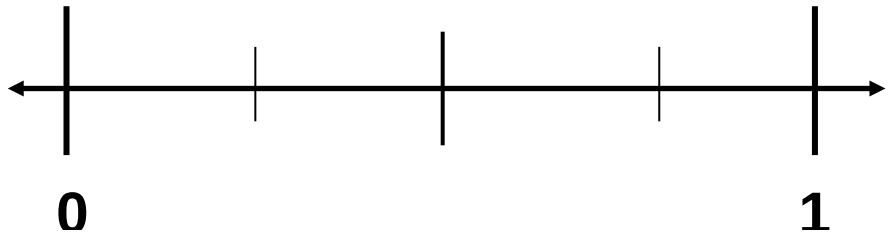
Answers:
(a) 3/10
(b) 0.3 (but 0.30 is not wrong)</td></tr>
</table>

_____**/11**
Total Points

Pre-Test

Name _____

	Problems
☐ 1a 1 point ☐ 1b 1 point	**1. Write the following fractions as decimals.** **(a)** $\frac{62}{100}$ **=** _____ **(b)** $\frac{7}{10}$ **=** _____
☐ 2a 1 point for array ☐ 2b 1 point for answer ☐ 2c 1 point for other method	**2. Represent 13 x 12 using an array.** **(a) Shade in the array.**  **(b) 13 x 12 =** _____ **(c) Show one other method to find the product of 13 x 12.**

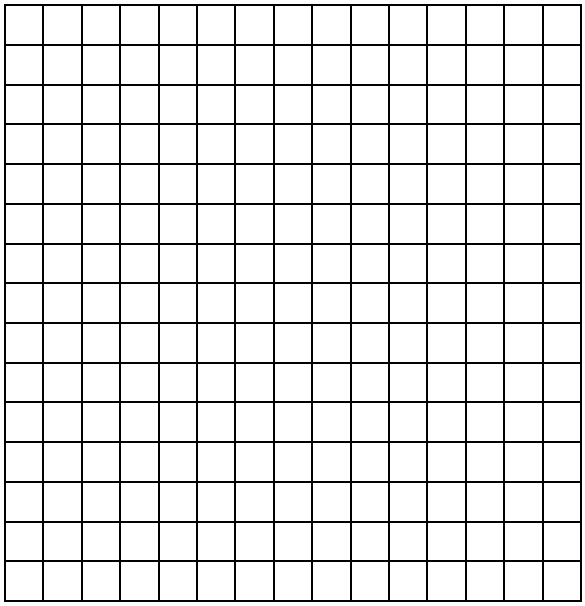
☐ 3 1 point	**3. Carolyn needs to walk another mile this week in order to meet her goal.** **Circle the longer trail:** **A. The Boulder Trail …….. 0.60 mile** **B. Five Falls Trail …….. 0.39 mile**
☐ 4 1 point	**4. Marci has two recipes for biscuits. One recipe needs** $\frac{1}{2}$ **cup of buttermilk and another that needs** $\frac{3}{4}$ **cup of buttermilk.** **Using the fractions above, write the comparison sentence:** _____ **>** _____
☐ 5 1 point	**5. Write these fractions on the number line.** $\frac{1}{2}$ $\frac{1}{4}$ 

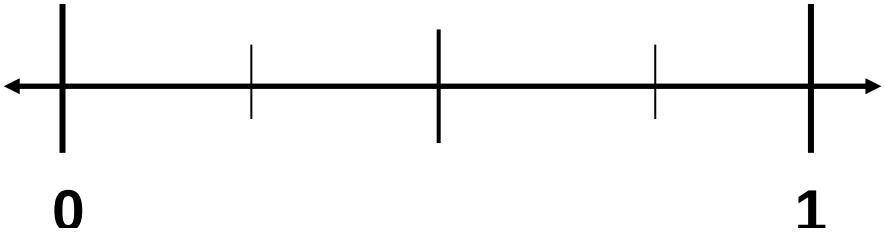
☐ 6a 1 Point Answer ☐ 6b 1 Point Strategy	**6. There are 42 corn stalks in a row of corn. There are 16 ears of corn on one stalk. How many ears of corn in all?** **Show your work.**
☐ 7 1 point	**7.**  **(a) Write the fraction that best represents the shaded portion of this bar. _____** **(b) Write the fraction as a decimal. _____**

_____/11
Total Points

Pre-Test - Spanish

Name _____

	Problemas
☐ 1a 1 punto ☐ 1b 1 punto	**1. Escribe las siguientes fracciones como decimales.** **(a)** $\frac{62}{100}$ **=** _____ **(b)** $\frac{7}{10}$ **=** _____
☐ 2a 1 punto para la matriz ☐ 2b 1 punto por la respuesta ☐ 2c 1 punto por el otro método	**2. Representa 13 x 12 usando una matriz.** **(a) Sombrea en la matriz.**  **(b) 13 x 12 =** _____ **(c) Muestra un método más para encontrar el producto de 13 x 12.**

☐ 3 1 punto	**3. Carolyn necesita caminar otra milla esta semana para completar su objetivo.** **Circula el camino más largo:** **A. El Camino de Boulder …….. 0.60 milla** **B. El Camino de Five Falls …….. 0.39 milla**
☐ 4 1 punto	**4. Marci tiene dos recetas para preparar galletas. Una receta necesita** $\frac{1}{2}$ **taza de leche dulce y la otra necesita** $\frac{3}{4}$ **taza de leche dulce.** **Usando las fracciones anteriores, escribe la oración de comparación:** _____ **>** _____
☐ 5 1 punto	**5. Escribe estas fracciones en la línea numérica.** $\frac{1}{2}$ $\frac{1}{4}$ 

☐ 6a 1 punto respuesta ☐ 6a 1 punto estrategia	**6. Hay 42 plantas de maíz en una hilara de maíz. Hay 16 mazorcas en una planta. ¿Cuántas son las mazorcas en total?** **Muestra tu trabajo.**
☐ 7 1 punto	**7.**  **(a) Escribe la fracción que mejor represente la porción sombreada de esta barra. _____** **(b) Escribe la fracción como un decimal. _____**

_____/11
Total Points

Summer Math

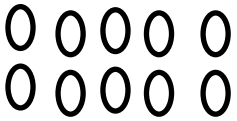
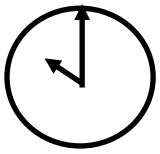
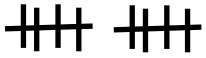
Educator Packet

Unit 1

Warm up: Target Number

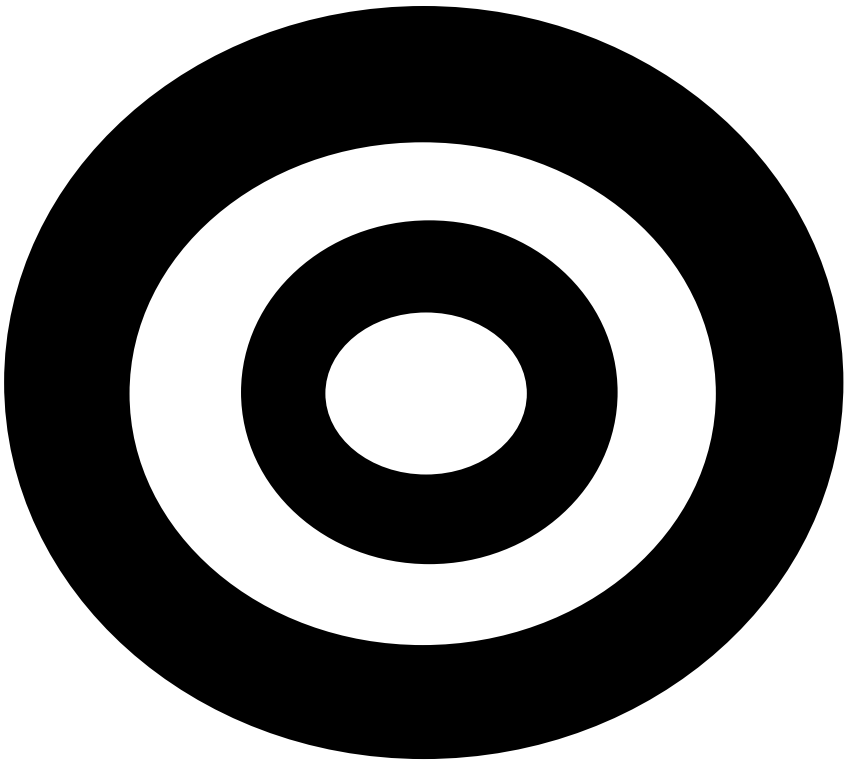
- The task is to represent the target number in different ways in one minute. Do a couple samples with students before starting the timer.
    a. Start all groups with the numbers 12 and 15.
        i. All target numbers are fair to use with students in grades 1 through 8.
        ii. Use numbers 20 and under for any "Cat-Icon" students in the group.
- Set the timer for one minute.
- Educators play along, and write examples to share related to the students' required math fluencies:
- At the end of the minute, students give ONE example at a time, going around the group a couple of times until all DIFFERENT responses are used. Students need to give **different** ways to represent the number. Writing, "7 + 3" is different from writing, "3 + 7". Drawing 7 circles and 3 circles is different from writing, "7 + 3."

Examples of some different ways to represent the number 10:

7 + 3	10 + 0	17 – 7	2 x 5	100 / 10	20/2
3 + 7	0 + 10	ten	5 x 2	10/1	10 x 1
					
One dozen eggs take away 2		2 + 2 + 2 + 2 + 2			100 - 90

Required [Math] Fluencies

Kindergarten	Add and subtract within 5	***Procedural Fluency***: can easily use a process to figure out the answer (for example, using manipulatives, diagrams)
Grade 1	Add and subtract within 10	***Procedural Fluency***
Grade 2	Single digit sums and differences (automaticity by the end of Grade 2); Add and subtract within 100	***Automaticity*** by the end of Grade 2: Knows the answer without stopping to use a process to figure out the answers.
Grade 3	Single digit products and quotients (product automaticity by the end of Grade 3)	***Automaticity for Products*** by the end of Grade 3
	Add and subtract within 1,000	***Procedural Fluency***
Grade 4	Add and subtract within 1,000,000	***Procedural Fluency***



Target Number

<u>Suggested Target Numbers</u>: Start with 12 and 15 for everyone for the first two sessions. Afterwards, numbers over 20 are fair for all grade bands except for the DOG ICON, which should just use numbers under 20**.**

12	15	24	36
60	48	100	45
90	50	75	

More choices: 9 18 6 20

FAMILY FUN GAME Directions

Key Points:

- Starting with Unit 2, the Family Fun Game gives students repeated practice in each of the Math Matters skills. This allows students to practice all of the skills throughout the summer.

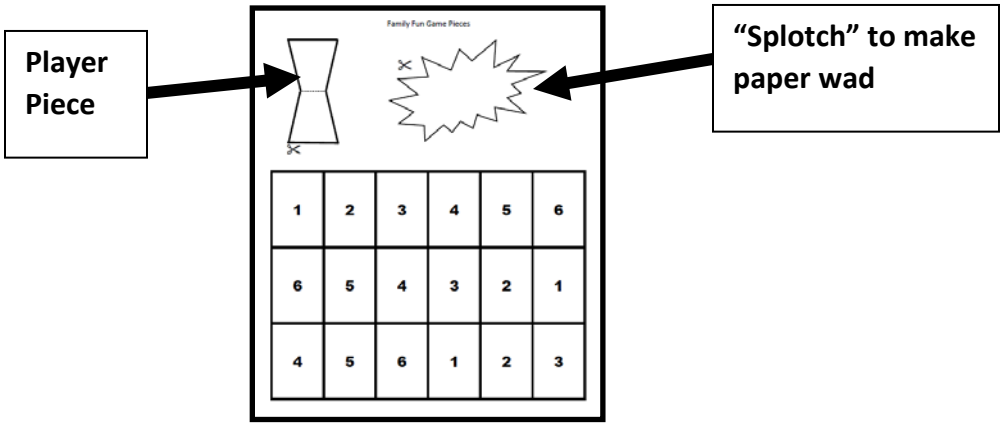
Process:

1. Each Student Packet has its own Family Fun Game Cards, allowing each student to participate with students who have different skills to practice.
2. Do not cut the cards apart! Starting with Lesson 2, the three cards in each row will practice the same skill.
3. Instead of students drawing a card, students select a problem from their grade band sheets. Students can select problems in the order they choose, BUT ask students to solve one problem from each row, before repeating from the row, so they practice each skill.
4. Game Directions are on the game board. Game boards are at the end of each Student Packet, so they are easy to pull off and use.
5. The best way to move around the board is to use dice. The Student Packets have a "Do It Yourself (DIY)" version to toss a small wad of paper onto a board of numbers.
6. Many students end up reading all of the problems in between turns as they search for the "best" ones to answer.

Do It Yourself (DIY) Game Pieces

Player: Cut the outside of the double trapezoid. Fold in half to make the player. If more than one student has the same color, students can write their names on the playing piece.

If you don't have a 6-sided die: Cut around the jagged "splotch" shape and wad the paper into a ball. Toss the ball onto the number board to find number of spaces to move.



BLM Unit 1 Family Fun Game Answer Key - All Levels

Problem Letter	Kinder (pink)	1-2 (blue)	3-4 (green)	5-6 (yellow)	7-8 (peach)
A	5¢ (cents)	$32	0.15	2.35	18 boys : 22 girls
B	6¢ (cents)	$42	0.2	1.2 or 1.20	11 girls : 20 total
C	7¢ (cents)	$55	0.42	0.42	12 boys : 27 total
D	8¢ (cents)	$78	0.05	13%	16 red : 27 total
E	9¢ (cents)	$62	1/4	1%	9 cups
F	10¢ (cents)	$82	2/8	34%	1 1/3 cups
G	6¢ (cents)	$28	1/3	25% and 1/4	18 cups
H	7¢ (cents)	$12	2/6	50% and 1/2	10 cups
I	8¢ (cents)	$8	10	75% and 3/4	7.5 ounces
J	10¢ (cents)	$10	3	1/4 2.35	$36
K	13¢ (cents)	$32	9	3/8	25 shirts
L	15¢ (cents)	$25	1	3/5	16 shirts
M	11¢ (cents)	$15	6	3/8	20 blocks
N	12¢ (cents)	$21	3	2/5	7.2 minutes
O	9¢ (cents)	$45	15	3/6 or 1/2	Martin runs faster. Martin runs 12 blks/6 min and Alicia runs 10 blks/6 min
P	14¢ (cents)	$37	8	8.2	5 gallons
Q	13¢ (cents)	$3	9	9.01	425 miles
R	16¢ (cents)	$19	28	151.2	$5.00

CGI CHARTS:

With a few changes, Math Matters' CGI Chart is in New York State's Next Generations Learning Standards for Grade 3 and Grade 4 for use with multiplication and division word problems involving Equal Groups and Arrays and Area Problems.

Key Points:

- Allows students to solve the problem in a way they understand, instead of the "right" way.
    - **NY-3.OA.3 –** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.
        - E.g., using drawings and equations with a symbol for the unknown number to represent the problem.
    - **NY-4.NBT.5 –** 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.

Process:

1. ***Pick one word problem.*** Spend time on the process instead of a quick answer.
    - For Grade Band 3-4, the multiplication/division terms on the (English) CGI Chart have been updated to represent the Next Generation terminology changes.
        - The "Compare" row of addition/subtraction problems remains for use to practice addition and subtraction during the summer.
        - Use the STAR (Grade 3) ★ or the TRIANGLE (Grade 4) ▲ for types of word problems on the summer math assessments.
2. **Read the problem to students,** using the choice of differentiated numbers to fill in the blanks.
3. ***Read again and encourage students to take notes on the graphic organizer***. (modeling, teaching the first time)
4. ***Give students time to solve.*** (If struggling, prompt with, "What number does the problem start with?" Do you want to draw this or use manipulatives to recreate it?)
    a. Have manipulatives and paper for students to choose either medium for solving the problem.
5. ***Ask students to explain their process before asking them for an answer.*** This allows students time to self-correct and gives the Educator a clue about how the student is thinking.
6. ***At the end, look at the final answer together, to decide if it solves the problem***. How would you say this in a sentence?

Unit 1 CGI Problems for *The Everything Kids' Money Books*

Compare	***(Difference Unknown)*** Eva and Frank's class was studying money. They were using plastic lids for money. Eva had ___ plastic lids and Frank had ____ plastic lids. How many more plastic lids did Eva have than Frank? (27, 15) (35, 29) (125, 97)	***(Bigger Unknown)*** Eva and Frank's class was studying money. They were using plastic lids for money. Eva had _____ plastic lids. Her friend, Frank, had ____ more plastic lids than Eva. How many plastic lids did Frank have? (39, 15) (27, 15) (106, 15)	***(Smaller Unknown)*** Eva and Frank's class was studying money. They were using plastic lids for money. Eva had ___ lids. She had ___ more lids than Frank. How many lids did Frank have? (75, 3) (17, 25) (215, 27)
Equal Groups	**(Unknown Product) ★ ▲** **a x b = ?** Carlos had ____ sets of pennies. There were ___ pennies in each set. How many pennies did he have in all? (4, 6) (9, 12) (12, 15)	**(Group Size Unknown) ★** **a x ? = p and p / a = ?** Carlos had ____ pennies he wanted to share equally among ___ bags. How many pennies will he put in each bag? (49, 7) (121, 11) (130, 6)	**(Number of Groups Unknown)** **? x b = p and p / b = ?** Carlos had _____ pennies. He wanted to store them in money bags, ____ to a bag. How many bags did he need? (24, 6) (144, 12) (125, 5)

Unit 1 CGI Problems for *The Everything Kids' Money Books*

Comparar	(*Diferencia desconocida)* En la clase de Eva y Frank estaban estudiando sobre el dinero. Usaban tapas plásticas como dinero. Eva tenía ___ tapas plásticas y Frank tenía ____ tapas plásticas. ¿Cuántas tapas plásticas adicionales tenía Eva? (27,15) (35, 29) (125, 97)	*(Cantidad comparativa desconocida)* En la clase de Eva y Frank estaban estudiando sobre el dinero. Usaban tapas plásticas como dinero. Eva tenía ___ tapas plásticas. Su amigo, Frank, tenía____ más que las que Eva tenía. ¿Cuántas tapas plásticas adicionales tenía Frank? (39,15) (27, 15) (106, 15)	(*Referentedesconocido)* En la clase de Eva y Frank estaban estudiando sobre el dinero y usaban tapas plásticas como dinero. Eva tenía___ más que las ____ que Frank tenía. ¿Cuántas tapas tenía Frank? (3, 75) (25, 17) (27, 215)
Agrupamiento y división	Multiplicación ★ ▲ Carlos contó ____ sets de _____ centavos. Había ___ centavos en cada set. ¿Cuántos centavos tenía Carlos en total ? (4, 6) (9, 12) (12, 15)	División de medidas ★ Carlos tenía ____ centavos que quería repartir igualmente entre ___ bolsas. ¿Cuántos centavos echará en cada bolsa? (49, 7) (121, 11) (130, 6)	División partitiva Carlos tenía ____centavos. Quería guardarlos en bolsas de dinero, ____ por bolsa. ¿Cuántas bolsas necesitaba? (24, 6) (144, 12) (125, 5)

Math Objectives
- Construct pictorial models of fractions.
- Compare fractional parts of a whole.
- Use fraction names and symbols to describe fractional parts of a whole.
- Use pictorial models to generate equivalent fractions.
- Compare fractions using pictorial models.

Language Objectives
- Discuss fraction comparisons.
- Discuss fraction equivalencies.

Vocabulary
- one-half
- one-eighth
- four-eighths
- equivalent
- greater than, less than

Materials:
- **BLM** string cheese Snack Fractions per student

Per Partners:
- 1 large string cheese*
- 2 paper dessert plates
- 2 paper towels
- 2 plastic knives

*(**NOTE:** Half of a piece of string cheese is not a very large snack for 3rd-4th graders. Please feel free to give each their own string cheese when they have completed the fraction portion of the activity.)

ELPS (*English Language Proficiency Standards*)
2D, 2E, 2F, 3E, 3G, 5A, 5F, 5G
CCRS *(College and Career Readiness Standards)*
ELA
II.A.2; II.B.1,2,3; II.D.1; III.B.1,2; IV.A.3; IV.B.1,2,3
Cross –Disciplinary
I.A.1,2; I.B.1,2; I.D.1,2,3,4; I.E.1,2.
Math
I.A.1; I.B.2.

Unit 1, Lesson 3 3-4

Snack Fractions

Children should wash their hands before this activity if using food items.

Snack Fractions
As part of each math day, please include a quick "Snack Fraction" activity. If your district/school does not allow any snacks to be given to students, please alter the activity by providing the paper shape to be divided into fractional parts.

In lesson 2 how did you share your ice cream sandwich? On your fraction record sheet, you showed the fractional part that each of you would receive; and you showed the fractional part that you would have received if there had been six of you sharing the ice cream sandwich.
- What fractional part did partners receive? *(halves, written 1/2)*
- What fractional part would each of six have received? *(one-sixth written 1/6)*
- What comparison sentence did you find when you compared your actual portion to a fourth? *(1/2 >1/6)*
- How did you find the sixths equivalence to half? *(student response)*

Today you are going to share a string cheese with a partner. Before you receive the actual snack, though, you will work through the String Cheese Snack Fraction record sheet. *(Distribute the sheet.)*

What is the same on this sheet as the other Snack Fraction sheets? *(upper portion dividing into halves)*

What is different? *(rounded rectangles instead of circles or real rectangles; dividing into eight portions instead of six)*

Once students have completed the record sheet, give them the actual snack and other supplies and let them share. This will be the format for subsequent snack fractions. When they are finished, have them complete the Snack Fraction Writing on the back of the BLM sheet or in their Math Journal Spiral.

Snack Fraction Journal Writing: BLM String Cheese Fractions
You have now divided snacks into halves, sixths and eighths. What can you tell about the denominator of fractions as you divide the snack for more people? What can you tell about the fractional portions of the snack as you divide for more people?

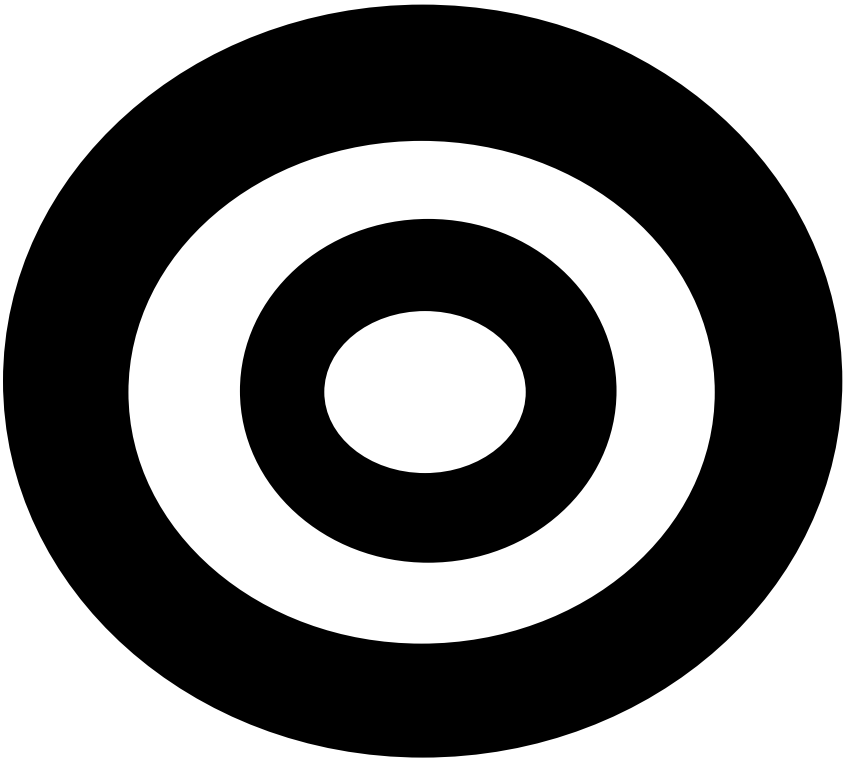
Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Summer Math

Student Packet/Paquete de alumno

Unit 1

English/Español

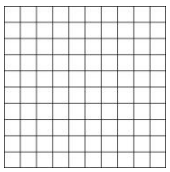


Target Number

BLM Unit 1, Follow-up Lesson 3 **Family Fun Game Cards**

Printed on ***green cardstock*** –one set per partners for class; one set per student for home.

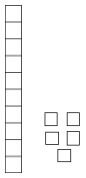
A.

When  represents one

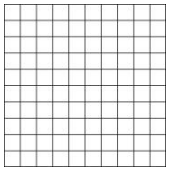
Cuando *representa uno*

write the decimal for: $\frac{15}{100}$

escribe el decimal para:



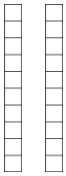
B

When  represents one

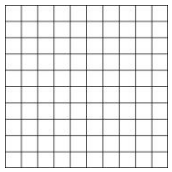
Cuando *representa uno*

write the decimal for: $\frac{2}{10}$

escribe el decimal para:



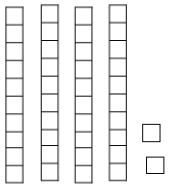
C.

When  represents one

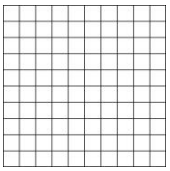
Cuando *representa uno*

write the decimal for: $\frac{42}{100}$

escribe el decimal para:



D.

When  represents one

Cuando *representa uno*

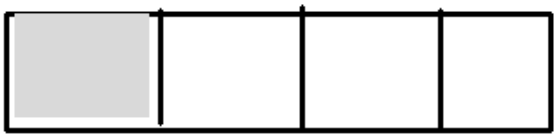
write the decimal for: $\frac{5}{100}$

escribe el decimal para:

E.

Write the fraction that best represents the shaded portion of this bar.

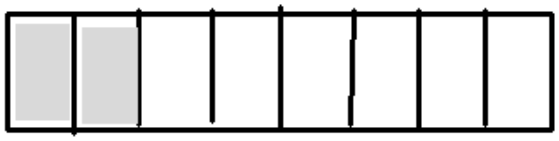
Escribe la fracción que mejor represente la porción sombreada de esta barra.



F.

Write the fraction that best represents the shaded portion of this bar.

Escribe la fracción que mejor represente la porción sombreada de esta barra.



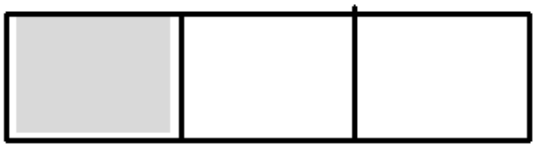
BLM Unit 1, Follow-up Lesson 3 **Family Fun Game Cards**

Printed on ***green cardstock*** –one set per partners for class; one set per student for home.

G.

Write the fraction that best represents the shaded portion of this bar.

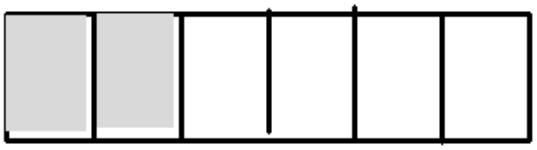
Escribe la fracción que mejor represente la porción sombreada de esta barra.



H.

Write the fraction that best represents the shaded portion of this bar.

Escribe la fracción que mejor represente la porción sombreada de esta barra.



I.

$3 \times \square = 30$

J.

$24 \div \square = 8$

K.

$3 \times \square = 27$

L.

$3 \times \square = 3$

BLM Unit 1, Follow-up Lesson 3 **Family Fun Game Cards**

Printed on ***green cardstock*** –one set per partners for class; one set per student for home.

M.

$18 \div 3 = \square$

N.

$12 \div \square = 4$

O.

$3 \times 5 = \square$

P.

$32 \div 4 = \square$

Q.

$36 \div \square = 4$

R.

$4 \times 7 = \square$

CGI Graphic Organizer

(Notes)

Show your work:

Write an equation:

Answer: _____
(label)

Explain your strategy:

_____

_____

_____

_____

(Notes)

Show your work:

Write an equation:

Answer: _____
(label)

Explain your strategy:

_____

_____

_____

_____

BLM Unit 1, Lesson 3 Snack Fraction **String Cheese Fractions**
(One sheet per student)

My name is _____

I shared a piece of string cheese with my partner today.

We each received _____ _____ . I can represent that fraction with numbers: _____.
(fraction in words) (fraction in number)

My portion looked like this:
(*Divide the shape into the fractional part, then shade your part.)*

If there had been eight of us,
my share would have looked like this:

In the space below, compare these two fractional parts.
Use < or > to compare.

I would only have had _____ _____. I can represent that fraction with numbers: _____.
(fraction in words) (fraction in number)

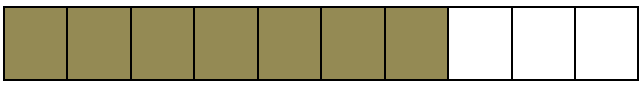
How many eighths would it take to equal one-half? _____

Write an equation which describes the relationship between one-half and four-eighths.

_____

Now use what you learned in math today to describe the UNshaded portion of the drawing as a fraction and as a decimal.

Decimal: _____ Fraction: _____
Can you write an equivalent fraction for this?



UNshaded amount? _____

BLM Unit 1, Lesson 3 Snack Fraction **String Cheese Fractions**
(One sheet per student)

Mi nombre es _____

Compartí una parte de queso con mi compañero hoy.

Cada uno recibimos _____ _____ . Puedo representar este número con una fracción: _____
(fracción en palabras) (fracción en números)

Así es mi porción:
(Divide el dibujo en partes fracionales y sombrea tu parte.)

Si hubiéramos sido ocho,
mi porción sería así:

In the space below, compare these two fractional parts.
Use < or > to compare.

Solo tendría _____ _____. Puedo representar esta fracción en números: _____.
(fracción en palabras) (fracción en números)

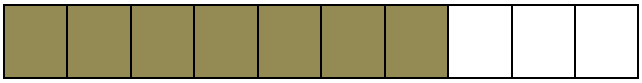
¿Cuántos octavos se necesita para igualar una mitad? _____

Escribe una ecuación que describe la relación entre una mitad y cuatro octavos.

_____

Ahora usa lo que aprendiste en la clase de matemáticas hoy para describer la porción NO sombreada del dibujo como una fracción y un decimal.

Decimal: _____ Fracción _____
¿Puedes escribir una fracción equivalente para la cantidad NO sombreada?? _____



Generic Family Fun Game Board

Materials Generic to All Units:

- Game Markers
- Game Cards for your Level
- Answer Key for your Level

Playing the Game

1. Begin in one of the corner shapes. There may be more than 1 player in each starting shape. Remember where you started.
2. On your turn, draw one of your level game cards and work the problem.
3. One of the other players uses the Answer Key to check your answer. If correct, roll the die and move ahead.

   If incorrect, do not move.

4. Game is over when the first person runs the entire track, ending back on the starting shape.

Tablero de juego

Materiales genéricos para todas las unidades:

- Fichas para jugar
- Tarjetas del juego para su nivel
- Clave de respuestas para su nivel

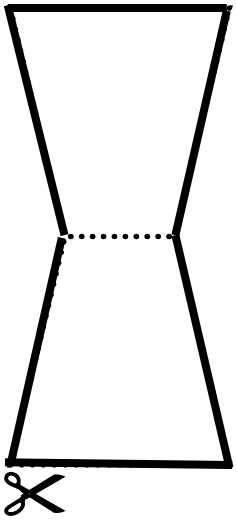
Cómo se juega

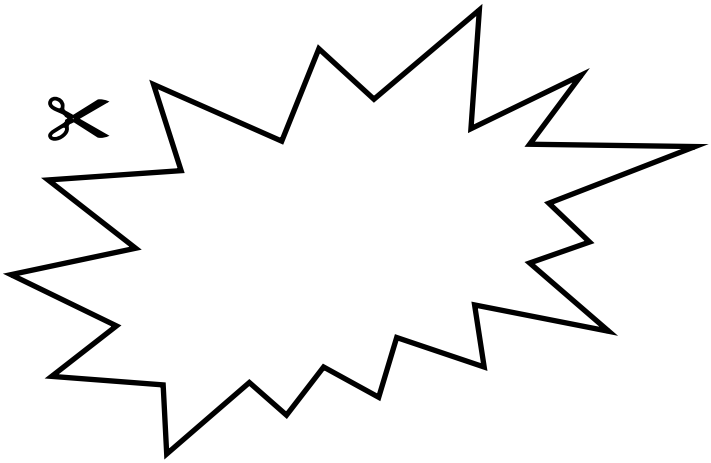
1. Empiece en una de las esquinas. Puede haber más de 1 jugador en cada figura de inicio.
2. Cuando sea su turno, saque una de las tarjetas de juego de su nivel y resuelva el problema.
3. Uno de los otros jugadores usa la clave de respuestas para ver si su respuesta es correcta. Si es correcta, tira el dado y sigue adelante.

   Si es incorrecta, no se mueve.

4. El juego se acaba cuando la primera persona recorre
toda la pista y termina en la figura de inicio.

Family Fun Game Pieces





1	2	3	4	5	6
6	5	4	3	2	1
4	5	6	1	2	3

Summer Math

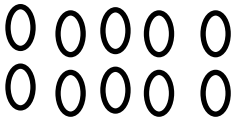
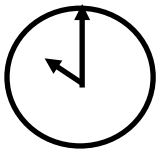
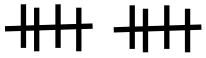
Educator Packet

Unit 2

Warm up: Target Number

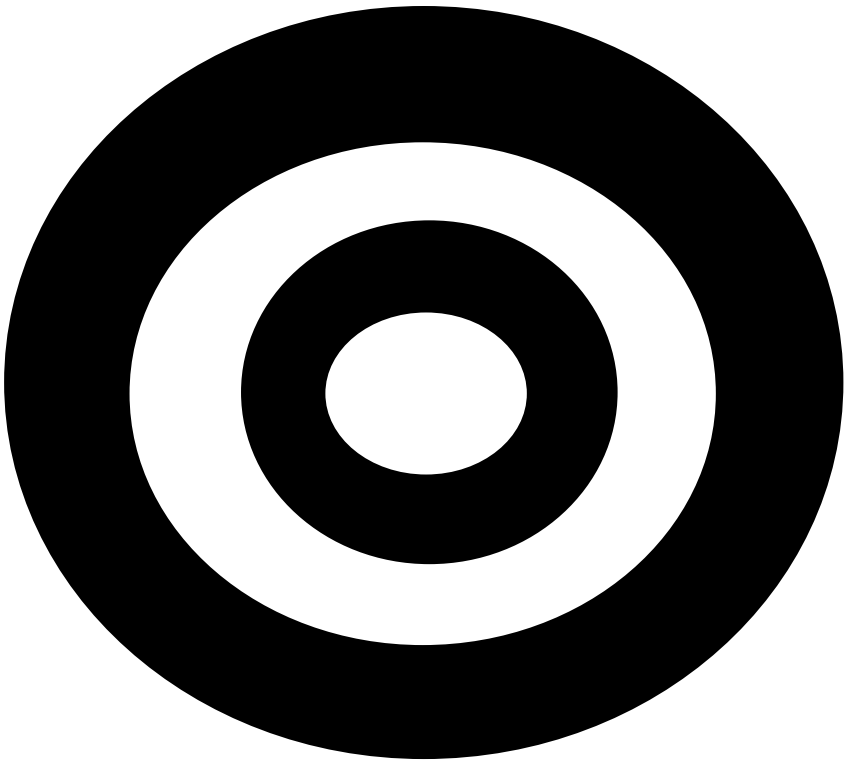
- The task is to represent the target number in different ways in one minute. Do a couple samples with students before starting the timer.
    a. Start all groups with the numbers 12 and 15.
        i. All target numbers are fair to use with students in grades 1 through 8.
        ii. Use numbers 20 and under for any "Cat-Icon" students in the group.
- Set the timer for one minute.
- Educators play along, and write examples to share related to the students' required math fluencies:
- At the end of the minute, students give ONE example at a time, going around the group a couple of times until all DIFFERENT responses are used. Students need to give **different** ways to represent the number. Writing, "7 + 3" is different from writing, "3 + 7". Drawing 7 circles and 3 circles is different from writing, "7 + 3."

Examples of some different ways to represent the number 10:

7 + 3	10 + 0	17 – 7	2 x 5	100 / 10	20/2
3 + 7	0 + 10	ten	5 x 2	10/1	10 x 1
					
One dozen eggs take away 2		2 + 2 + 2 + 2 + 2			100 - 90

Required [Math] Fluencies

Kindergarten	Add and subtract within 5	***Procedural Fluency***: can easily use a process to figure out the answer (for example, using manipulatives, diagrams)
Grade 1	Add and subtract within 10	***Procedural Fluency***
Grade 2	Single digit sums and differences (automaticity by the end of Grade 2); Add and subtract within 100	***Automaticity*** by the end of Grade 2: Knows the answer without stopping to use a process to figure out the answers.
Grade 3	Single digit products and quotients (product automaticity by the end of Grade 3)	***Automaticity for Products*** by the end of Grade 3
	Add and subtract within 1,000	***Procedural Fluency***
Grade 4	Add and subtract within 1,000,000	***Procedural Fluency***



Target Number

<u>Suggested Target Numbers</u>: Start with 12 and 15 for everyone for the first two sessions. Afterwards, numbers over 20 are fair for all grade bands except for the DOG ICON, which should just use numbers under 20**.**

12	15	24	36
60	48	100	45
90	50	75	

More choices: 9 18 6 20

FAMILY FUN GAME Directions

Key Points:

- Starting with Unit 2, the Family Fun Game gives students repeated practice in each of the Math Matters skills. This allows students to practice all of the skills throughout the summer.

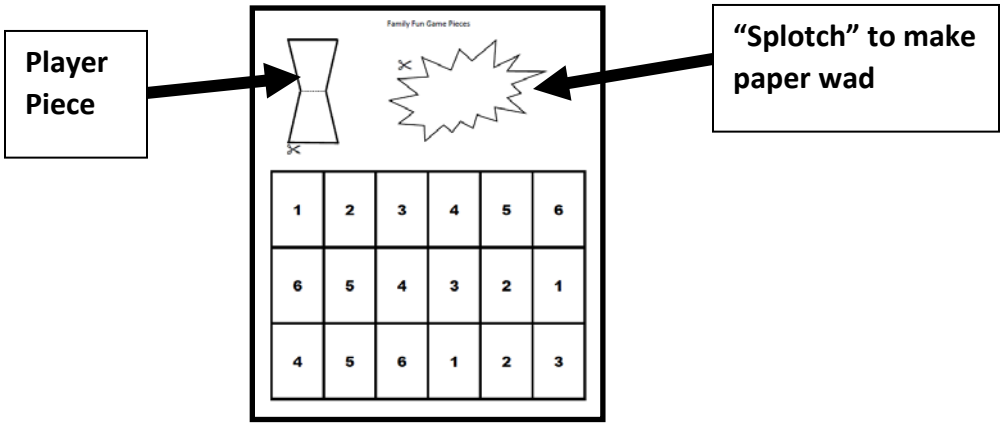
Process:

1. Each Student Packet has its own Family Fun Game Cards, allowing each student to participate with students who have different skills to practice.
2. Do not cut the cards apart! Starting with Lesson 2, the three cards in each row will practice the same skill.
3. Instead of students drawing a card, students select a problem from their grade band sheets. Students can select problems in the order they choose, BUT ask students to solve one problem from each row, before repeating from the row, so they practice each skill.
4. Game Directions are on the game board. Game boards are at the end of each Student Packet, so they are easy to pull off and use.
5. The best way to move around the board is to use dice. The Student Packets have a "Do It Yourself (DIY)" version to toss a small wad of paper onto a board of numbers.
6. Many students end up reading all of the problems in between turns as they search for the "best" ones to answer.

Do It Yourself (DIY) Game Pieces

Player: Cut the outside of the double trapezoid. Fold in half to make the player. If more than one student has the same color, students can write their names on the playing piece.

If you don't have a 6-sided die: Cut around the jagged "splotch" shape and wad the paper into a ball. Toss the ball onto the number board to find number of spaces to move.



BLM Unit 2 **Family Fun Game Answer Key - All Levels**

Problem Letter	Kinder	1-2	3-4	5-6	7-8
A	10 ¢	$46	2 x 5 = 10 5 x 2 = 10 10 ÷ 2 = 5 10 ÷ 5 = 2	1.25	50% increase
B	10 ¢	$59	5 x 4 = 20; 20 ÷ 4 = 5	1.21	75% increase
C	12 ¢	$45	3 x 6 = 18; 18÷ 6 = 3	0.22	20% decrease
D	11 cents	$40	42	three-sixths or half	$\frac{8\text{ oz}}{1\text{ c}} = \frac{x\text{ oz}}{3\text{ c}}$
E	10 cents	$90	8	five-eighths	$\frac{16\text{ oz}}{1\text{ lb}} = \frac{x\text{ oz}}{4\text{ lb}}$
F	12 cents	$85	45	three-eighths	$\frac{36\text{ in}}{1\text{ yd}} = \frac{72\text{ in}}{x\text{ yd}}$
G	15 cents	$37	5 blouses	$108.55	$0.60 or 60¢
H	14 cents	$52	$4 each	6.4 miles	$1.75
I	18 cents	$26	4 in each row	50.2 miles	$0.90 or 90¢
J	6 + 4	2 + 7 = 9 7 + 2 = 9 9 – 2 = 7 9 – 7 = 2	0.76	9	$13.14
K	5 + 5	7 + 3 = 10 3 + 7 = 10 10 – 7 = 10 10 – 3 = 7	0.08	7	$18.90
L	1 + 9	6 + 9 = 15 9 + 6 = 15 15 – 9 = 6 15 – 6 = 9	0.19	9	$15.90
M	10, 20, 30, 40, 50, 60, 70, 80, 90, 100	22 perch	$\frac{9}{10}$	14	$2.59
N	9 ants	6 fish were left	6/10	42	$7.50
O	5 bugs	10 tadpoles left	4/10	16	$4.58
P	4 coyotes	8, 2 make 10	0.33 , 0.5	one-thrid	$1.64
Q	7 sage leaves	1, 9 make 10	11.99	three-sixths or half	$2.36
R	5 – 1 = 4	3, 7 make ten	Drew	five-eighths	$3.75

CGI CHARTS:

With a few changes, Math Matters' CGI Chart is in New York State's Next Generations Learning Standards for Grade 3 and Grade 4 for use with multiplication and division word problems involving Equal Groups and Arrays and Area Problems.

Key Points:

- Allows students to solve the problem in a way they understand, instead of the "right" way.
    - **NY-3.OA.3 –** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.
        - E.g., using drawings and equations with a symbol for the unknown number to represent the problem.
    - **NY-4.NBT.5 –** 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.

Process:

1. ***Pick one word problem.*** Spend time on the process instead of a quick answer.
    - For Grade Band 3-4, the multiplication/division terms on the (English) CGI Chart have been updated to represent the Next Generation terminology changes.
        - The "Compare" row of addition/subtraction problems remains for use to practice addition and subtraction during the summer.
        - Use the STAR (Grade 3) ★ or the TRIANGLE (Grade 4) ▲ for types of word problems on the summer math assessments.
2. **Read the problem to students,** using the choice of differentiated numbers to fill in the blanks.
3. ***Read again and encourage students to take notes on the graphic organizer***. (modeling, teaching the first time)
4. ***Give students time to solve.*** (If struggling, prompt with, "What number does the problem start with?" Do you want to draw this or use manipulatives to recreate it?)
    a. Have manipulatives and paper for students to choose either medium for solving the problem.
5. ***Ask students to explain their process before asking them for an answer.*** This allows students time to self-correct and gives the Educator a clue about how the student is thinking.
6. ***At the end, look at the final answer together, to decide if it solves the problem***. How would you say this in a sentence?

Unit 2 CGI Problems for *A Savanna Habitat*

Compare	(*Difference Unknown)* The tallest giraffe in the world, called George, was 19.7 feet tall. The average for giraffe height is 16.8 feet. How much taller was George than the average? (*These measures are true to the giraffe.)*	*(Bigger Unknown)* The giraffe's heart is very special because it has to pump blood up that very long neck. The average giraffe heart weighs 22 pounds. That is 21.5 pounds more than the average human heart. How much does the average human heart weigh? (*These measures are true to the giraffe.)*	(*Smaller Unknown)* A giraffe's tongue is very long so that it can reach and grab leaves from their favorite acacia tree. A human's tongue is about 4 inches long, which is about 14 inches shorter than the giraffe's. How long is the giraffe's tongue? (*These measures are true to the giraffe.)*
Equal Groups	**(Unknown Product)** ★ **a x b = ?** ▲ The Safari guide watched the birds for signs of weather change. He saw _____ flocks of birds, each of which had ____ birds. How many birds did he see? (5, 10) (5, 125) (12, 15)	**(Group Size Unknown)** **a x ? = p and p / a = ?** ★ The Nature Preserve had _____ acres to parcel into _____ acre home sites. How many home sites could they create? (50, 5) (125, 25) (1000, 20)	**(Number of Groups Unknown)** **? x b = p and / \ b = ?** The Nature Preserve had _____ acres to share among _____ people for home sites. How many acres would each person receive if the shares are equal? (35, 7) (150, 10) (2500, 25)

Unit 2 CGI Problems for *A Savanna Habitat*

Comparar	(*Diferencia desconocida)* La jirafa más alta del mundo, llamada George, tenía 19.7 pies de altura. El promedio de altura de las jirafas es 16.8 pies. ¿Cuánto más alta que el promedio era George? (*Estas son las medidas correctas para la jirafa.)*	*(Cantidad comparativa desconocida)* El corazón de la jirafa es bien especial porque tiene que bombear sangre hacia arriba a lo largo de todo ese cuello tan largo. El corazón de la jirafa promedio pesa 22 libras. Pesa 21.5 libras más que el corazón humano promedio. ¿Cuánto pesa el corazón humano promedio? (*Estas son las medidas correctas para la jirafa.)*	(*Referentedesconocido)* La lengua de la jirafa es bien larga para poder alcanzar y agarrar hojas del árbol de acacia, su favorito. La lengua humana mide alrededor de 4 pulgadas, 14 pulgadas más corta que la de la jirafa. ¿Cuánto mide de largo la lengua de la jirafa? (*Estas son las medidas correctas para la jirafa.)*
Agrupamiento y división	Multiplicación ★ ▲ El guía del safari observó a los pájaros para detectar señales de algún cambio en el tiempo. Vio _____ bandadas de pájaros, cada una de las cuales tenía ____ pájaros. ¿Cuántos pájaros vio? (5, 10) (5, 125) (12, 15)	División de medidas ★ La reverva natural tenía _____ acres para dividir entre lotes de _____ acres. ¿Cuántos lotes para casas pudieron crear? (50, 5) (125, 25) (1,000, 20)	División partitiva La reserva natural tenía _____ acres para compartir entre _____ personas para lotes de casas. ¿Cuántos acres recibiría cada persona si los lotes fueran iguales? (35, 7) (150, 10) (2500, 25)

Math Objectives
- Construct pictorial models of fractions.
- Compare fractional parts of a whole.
- Use fraction names and symbols to describe fractional parts of a whole.
- Use pictorial models to generate equivalent fractions.
- Compare fractions using pictorial models.

Language Objectives
- Discuss fraction comparisons.
- Discuss fraction equivalencies.
- Discuss fraction/decimal relationships.

Vocabulary
one-half
one-sixth
three-sixths
equivalent
greater than
less than

Materials:
1 per student
- **BLM** Trail Mix Fractions
- **BLM** Trail Mix Fraction Pieces

Per Partners:
- 2 cups Trail Mix (you may purchase already made, or have students mix their own with 1/2 of each of the following)
  - pecans
  - semi chocolate chips
  - granola
  - raisins
- two 1-cup measuring cups
- 2 paper dessert plates
- 2 paper towels
- 2 plastic knives

Unit 2, Lesson 2 3-4

Snack Fractions

Children should wash their hands before this activity if using food items.

Snack Fractions
As part of each math day, please include a quick "Snack Fraction" activity. If your district/school does not allow any snacks to be given to students, please alter the activity by providing the paper shape to be divided into fractional parts.

Students share exactly as they did in Lesson 1, finding halves for themselves, then using the materials to find equivalencies for sixths. This time, though, have them find as many as they can using the sixths pictorial models before they glue them to the recording paper. *(3/6 = 1/2 ; 6/6 = 2/2)*

Work with each group as the need arises.

Snack Fraction Journal Writing: BLM Trail Mix Fractions
Prove with your snack sixth pictorial models that 4/6 = 2/3, and explain how you know.

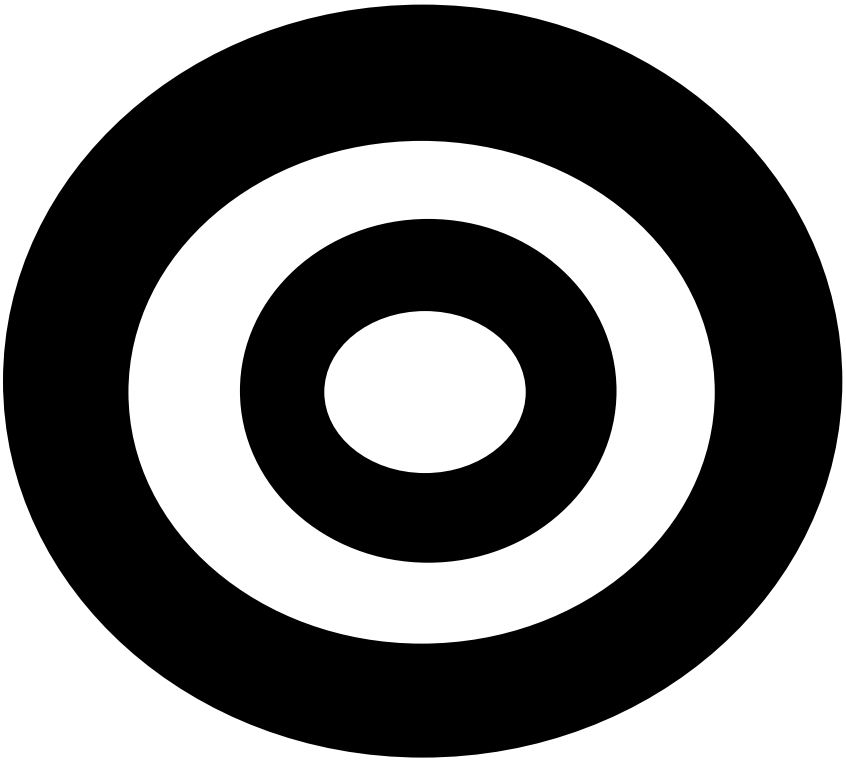
Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Summer Math

Student Packet/Paquete de alumno

Unit 2

English/Español



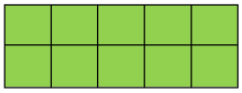
Target Number

BLM Unit 2, Follow-up Lesson 3 **Family Fun Game Cards**

Print on green cardstock –One set for class exploration; one set per student for home. (There are two pages of cards.)

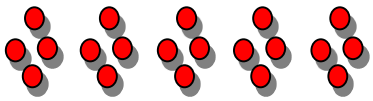
A

Write the number sentences for the fact family for this area model array.



Escribe las oraciones numéricas para la familia de operaciones para este modelo de conjunto.

B



What number sentence does this picture model? ¿Qué oracion numérica modela esta representación?

C

What number sentence does this picture model?

¿Qué oracion numérica modela esta representación?

D

$\square \div 7 = 6$

E

$48 \div \square = 6$

F

$\square \div 9 = 5$

G

Kayla has 15 buttons. She wants to sew 3 buttons on each of her blouses. How many blouses does she have?

Kayla tiene 15 botones. Quiere coser 3 botones en cada blusa que tiene. ¿Cuántas blusas tiene?

H

Martin has $16. He wants to spend equally on 4 friends. How much will he spend on each friend?

Martín tiene $16. Quiere gastarlo igualmente entre sus 4 amigos. ¿Cuánto puede gastar en cada amigo?

I

20 ants were marching on the sidewalk. They were in 5 equal rows. How many were in each row?

20 hormigas caminaban en la acera. Había 5 filas iguales. ¿Cuántas hormigas había en cada fila?

Print on green cardstock –One set per partners for class; one set per student for home. (There are two pages of cards.)

J
Write this fraction as a decimal.
Escribe esta fracción como decimal.

$$\frac{76}{100}$$

K
Write this fraction as a decimal.
Escribe esta fracción como decimal.

$$\frac{8}{100}$$

L
Write this fraction as a decimal.
Escribe esta fracción como decimal.

$$\frac{19}{100}$$

M
What fraction best represents the shaded portion of the bar.

¿Qué fracción mejor representa la porción sombreada de la barra?

N
What fraction best represents the shaded portion of the bar.

¿Qué fracción mejor representa la porción sombreada de la barra?

O
Which fraction best represents the shaded portion of the bar.

¿Qué fracción mejor representa la porción sombreada de la barra?

P
Write the decimals from smallest to largest.

Escribe los decimales de más pequeño a más grande.

0.5 **0.33**

Q
Which decimal is closest to 12?

¿Cuál de los decimales es más cerca a 12?

11.9 **11.99**

R
Who ate more pizza?
Liz – 0.35 of a pizza
Drew – 0.9 of a pizza

¿Quién comió más pizza?
Liz – 0.35 de una pizza
Drew– 0.9 de una pizza

CGI Graphic Organizer

(Notes)

Show your work:

Write an equation:

Answer: _____
(label)

Explain your strategy:

_____

_____

_____

_____

(Notes)

Show your work:

Write an equation:

Answer: _____
(label)

Explain your strategy:

_____

_____

_____

_____

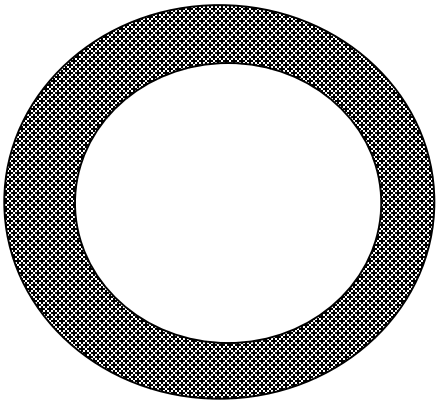
BLM Unit 2, Snack Fraction Lesson 2 **Trail Mix Snack Fractions**
(One sheet per student)

My name is _____

I shared Trail Mix with my partner today.

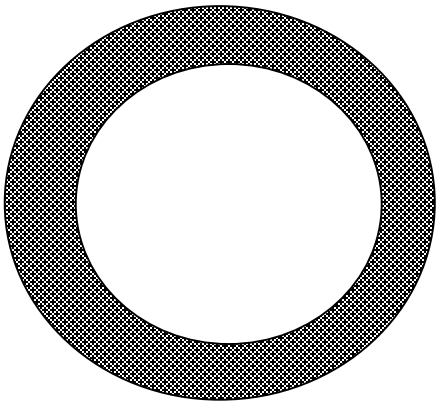
Cut out one set of the snack representations at the bottom of this page. Divide that into fractional portions for sharing between two people. Glue your portion to the plate.

My fractional portion would be: _____



Cut out one set of the snack representations at the bottom of this page. Divide that into fractional portions for sharing among six people. Glue your portion to the plate.

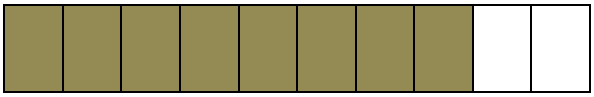
My fractional portion would be: _____



Write a comparison statement for these two unit fractions using <, =, or >. _____

Use the models to find an equivalent fraction for one-half in sixths: _____

Now use what you have learned to describe the SHADED portion of the drawing as a fraction and as a decimal.



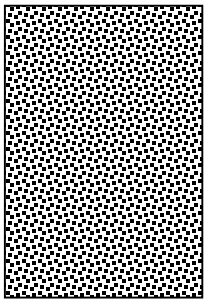
Decimal: _____ Fraction: _____

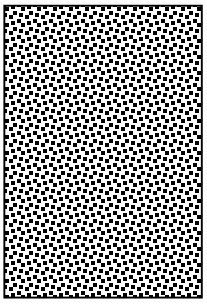
Write a different equivalent fraction

for this amount. _____

How did you find the equivalent fraction?

SNACK REPRESENTATIONS: Cut out the pieces below to divide into the fractional portions

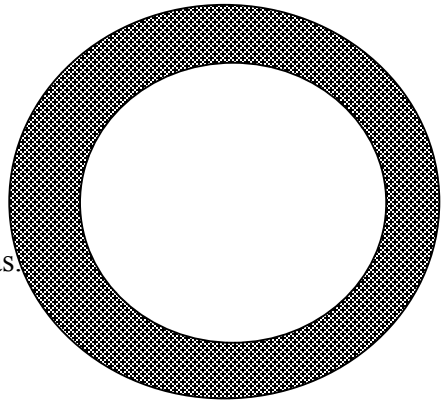




BLM Unidad 2, Fracciones de refrigerio Lección 2 **Fracciones de refrigerio de granola**

(Una hoja por estudiante)

Mi nombre es _____



Hoy compartí granola con mi compañero.

Recorta un juego de representaciones de refrigerios de la parte inferior de esta página. Divídelo en porciones fraccionales para compartir entre dos personas. Pega tu porción en el plato

Mi porción fraccional sería: _____

Recorta un juego de representaciones de refrigerios de la parte inferior de esta página. Divídelo en porciones fraccionales para compartir entre seis personas. Pega tu porción en el plato.

Mi porción fraccional sería: _____

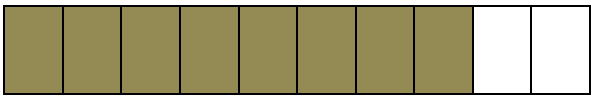
Escribe una comparación para estas dos unidades fraccionales usando <, =, o >.

_____

Usa los modelos para encontrar una fracción equivalente para un medio en sextos:

_____

Ahora usa lo que has aprendido para describir la porción SOMBREADA del dibujo como fracción y como decimal.



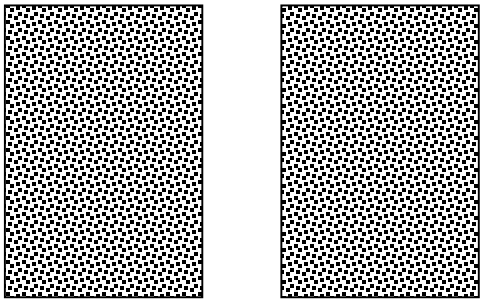
Decimal: _____ Fracción: _____

REPRESENTACIONES DE REFRIGERIOS:
Recorta las piezas siguientes para dividirlas en las

Escribe una fracción equivalente distinta

para esta cantidad. _____

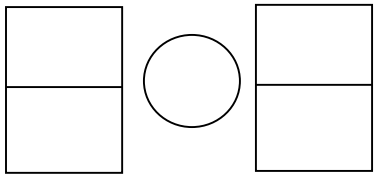
¿Cómo encontraste la fracción equivalente?



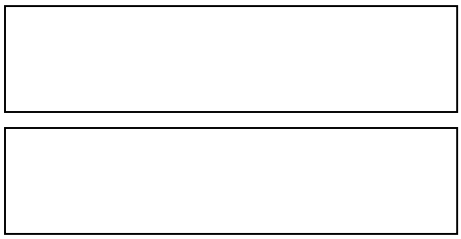
BLM Unit 2, Snack Fraction Lesson 2, page 2 **Trail Mix Fraction Pieces**
(One sheet per student)

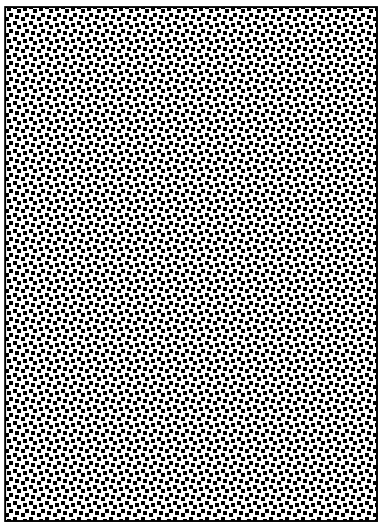
First of all, compare the two unit fractions by writing the fractions in the rectangle and using < or > in the circle between the two fractions.

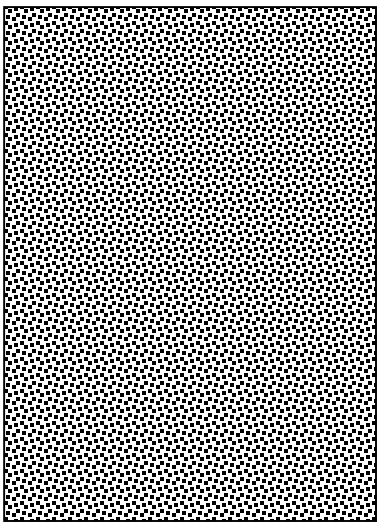
Circle the portion you would rather have.



Now, use the two rectangles below to show how many sixths you would need to be equivalent to one-half.



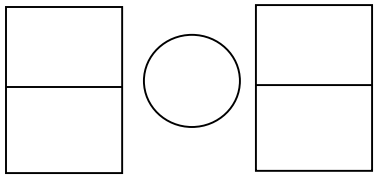




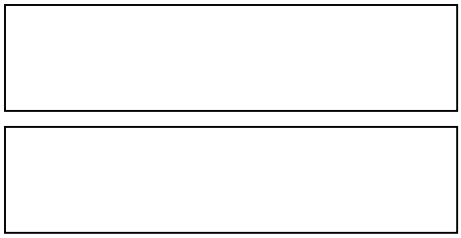
BLM Unit 2, Snack Fraction Lesson 2, page 2 **Trail Mix Fraction Pieces**
(One sheet per student)

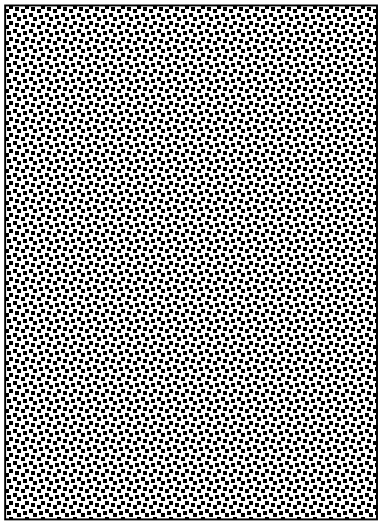
Primeramente, compara las dos unidades fraccionales y escribe las fracciones en el rectángulo y usa < o > en el círculo entre las dos fracciones.

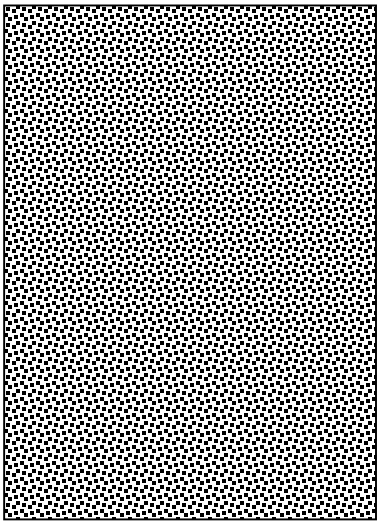
Haz un círculo alrededor de la porción que te gustaría recibir.



Ahora, usa los 2 rectángulos aquí debajo para mostrar cuántos sextos hubieras necesitado para ser equivalentes a una mitad.







Generic Family Fun Game Board

Materials Generic to All Units:

- Game Markers
- Game Cards for your Level
- Answer Key for your Level

Playing the Game

1. Begin in one of the corner shapes. There may be more than 1 player in each starting shape. Remember where you started.
2. On your turn, draw one of your level game cards and work the problem.
3. One of the other players uses the Answer Key to check your answer. If correct, roll the die and move ahead.

   If incorrect, do not move.

4. Game is over when the first person runs the entire track, ending back on the starting shape.

Tablero de juego

Materiales genéricos para todas las unidades:

- Fichas para jugar
- Tarjetas del juego para su nivel
- Clave de respuestas para su nivel

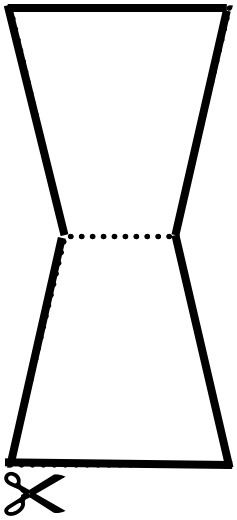
Cómo se juega

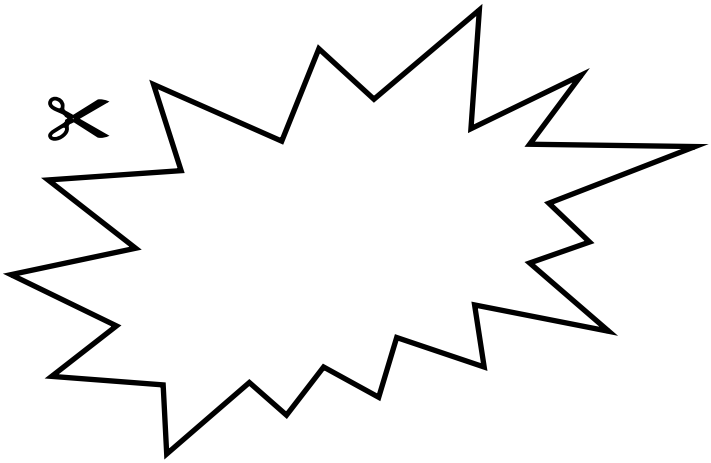
1. Empiece en una de las esquinas. Puede haber más de 1 jugador en cada figura de inicio.
2. Cuando sea su turno, saque una de las tarjetas de juego de su nivel y resuelva el problema.
3. Uno de los otros jugadores usa la clave de respuestas para ver si su respuesta es correcta. Si es correcta, tira el dado y sigue adelante.

   Si es incorrecta, no se mueve.

4. El juego se acaba cuando la primera persona recorre
toda la pista y termina en la figura de inicio.

Family Fun Game Pieces





1	2	3	4	5	6
6	5	4	3	2	1
4	5	6	1	2	3

Summer Math

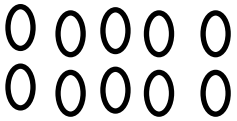
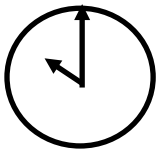
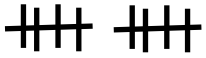
Educator Packet

Unit 3

Warm up: Target Number

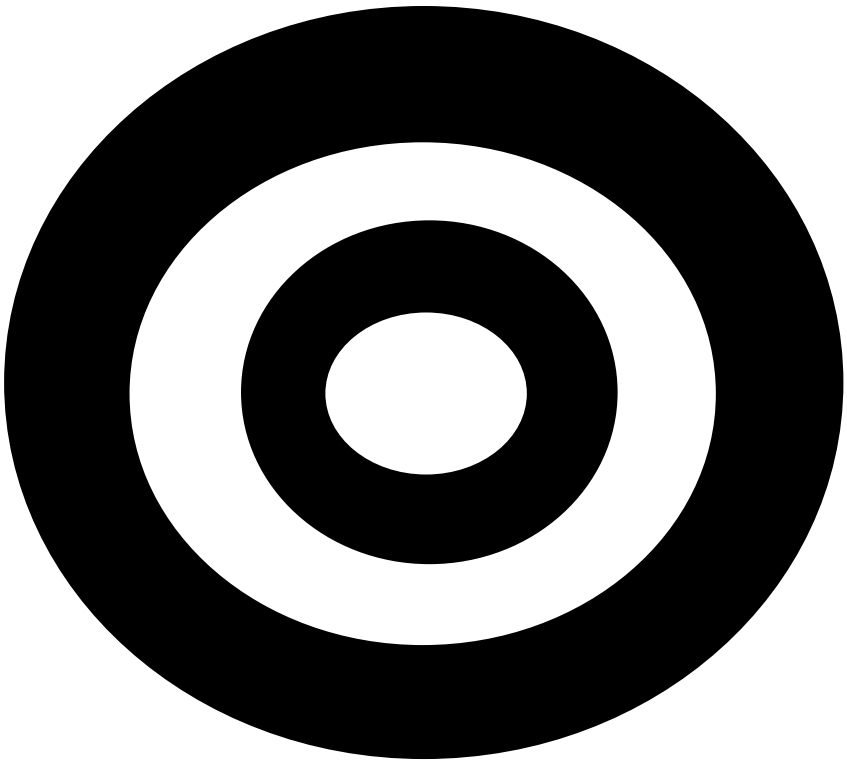
- The task is to represent the target number in different ways in one minute. Do a couple samples with students before starting the timer.
    a. Start all groups with the numbers 12 and 15.
        i. All target numbers are fair to use with students in grades 1 through 8.
        ii. Use numbers 20 and under for any "Cat-Icon" students in the group.
- Set the timer for one minute.
- Educators play along, and write examples to share related to the students' required math fluencies:
- At the end of the minute, students give ONE example at a time, going around the group a couple of times until all DIFFERENT responses are used. Students need to give **different** ways to represent the number. Writing, "7 + 3" is different from writing, "3 + 7". Drawing 7 circles and 3 circles is different from writing, "7 + 3."

Examples of some different ways to represent the number 10:

7 + 3	10 + 0	17 – 7	2 x 5	100 / 10	20/2
3 + 7	0 + 10	ten	5 x 2	10/1	10 x 1
					
One dozen eggs take away 2		2 + 2 + 2 + 2 + 2			100 - 90

Required [Math] Fluencies

Kindergarten	Add and subtract within 5	***Procedural Fluency***: can easily use a process to figure out the answer (for example, using manipulatives, diagrams)
Grade 1	Add and subtract within 10	***Procedural Fluency***
Grade 2	Single digit sums and differences (automaticity by the end of Grade 2); Add and subtract within 100	***Automaticity*** by the end of Grade 2: Knows the answer without stopping to use a process to figure out the answers.
Grade 3	Single digit products and quotients (product automaticity by the end of Grade 3)	***Automaticity for Products*** by the end of Grade 3
	Add and subtract within 1,000	***Procedural Fluency***
Grade 4	Add and subtract within 1,000,000	***Procedural Fluency***



Target Number

<u>Suggested Target Numbers</u>: Start with 12 and 15 for everyone for the first two sessions. Afterwards, numbers over 20 are fair for all grade bands except for the DOG ICON, which should just use numbers under 20**.**

12	15	24	36
60	48	100	45
90	50	75	

More choices: 9 18 6 20

FAMILY FUN GAME Directions

Key Points:

- Starting with Unit 2, the Family Fun Game gives students repeated practice in each of the Math Matters skills. This allows students to practice all of the skills throughout the summer.

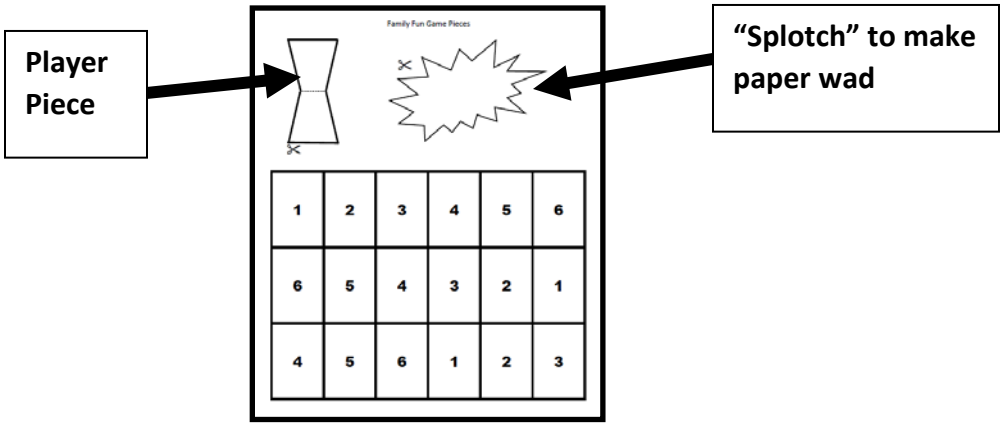
Process:

1. Each Student Packet has its own Family Fun Game Cards, allowing each student to participate with students who have different skills to practice.
2. Do not cut the cards apart! Starting with Lesson 2, the three cards in each row will practice the same skill.
3. Instead of students drawing a card, students select a problem from their grade band sheets. Students can select problems in the order they choose, BUT ask students to solve one problem from each row, before repeating from the row, so they practice each skill.
4. Game Directions are on the game board. Game boards are at the end of each Student Packet, so they are easy to pull off and use.
5. The best way to move around the board is to use dice. The Student Packets have a "Do It Yourself (DIY)" version to toss a small wad of paper onto a board of numbers.
6. Many students end up reading all of the problems in between turns as they search for the "best" ones to answer.

Do It Yourself (DIY) Game Pieces

Player: Cut the outside of the double trapezoid. Fold in half to make the player. If more than one student has the same color, students can write their names on the playing piece.

If you don't have a 6-sided die: Cut around the jagged "splotch" shape and wad the paper into a ball. Toss the ball onto the number board to find number of spaces to move.



BLM Unit 3, Follow-Up Lesson 3 Family Fun Game All Level Answer Key

Problem	Kinder (pink)	1-2 (blue)	3-4 (green)	5-6 (yellow)	7-8 (peach)
A	15 dots Number 15	7 + 6 = 13 6 + 7 = 13 13 -7 = 6 13 – 6 = 7	0.9	2.26	7.5 units
B	5 butterflies Number 5	5 + 8 = 13 8 + 5 = 13 13 – 5 = 8 13 – 8 = 5	0.06	1/6	36 units
C	9 stars Number 9	7 + 9 = 16 9 + 7 = 16 16 – 9 = 7 16 – 7 = 9	0.4	32,770.77	5 units
D	Count out 8 counters	8, 2 make ten	solve for 169	210.55	25 x 30
E	Count out 15 counters	3, 7 make ten	solve for 143	0.75	10.42 feet
F	Count out 10 counters	5, 5 make ten	solve for 195	0.07	L = 7 inches W = 2.8 inches
G	12 ants	14 + 5 = 19 Sue read 19 picture books.	0.45, 0.75	0.05, 5%	$0.20
H	10 leaves	13 – 9 = 4 Eddie picked up 4 fewer rocks.	0.7 0.56	9	$4
I	3 bugs	Divided into 2 equal or same size pieces.	0.08 0.9	18	$1.33 or $1.34
J	2 eggs	4 tens and 5 ones (now count them) 45	4/6 They are equivalent	4 tiles 1 color 1 tile another color	$10.75 (pennies difference for rounding is acceptable)
K	10 eggs	3 tens and 9 ones (now count them) 39	1/2 5/8 is just a little more than a half; 1/3 is smaller than 1/2	5 tiles 1 color 3 tiles another color	$26.22 (pennies difference for rounding is acceptable)
L	8 were brown	6 tens and 6 ones (now count them) 66	1/4 They are equivalent	3 tiles 1 color 7 tiles another color	$14.09 (pennies difference for rounding is acceptable)
M	Penny	5	8/10 = 0.8	3:4 and 3/4	1.5 hr or 1 ½ hours
N	Penny	12	4/10 = 0.4	6:1 and 6/1	3 hours
O	Dime	46	7/10 = 0.7	3:5 and 3/5	9 hours
P	Blue set On bottom	Ally had 33 cupcakes.	5 x 4 = 20 4 x 5 = 20 20 ÷ 5 = 4 20 ÷4 = 5	x = 3	16/1 = x/3 OR 1/16 = 3/x
Q	9 (red) ovals on right	12 cupcakes were not eaten.	24	x = 9	12/1 = x/4 OR 1/12 = 4/3
R	10 (red) hearts on left	17 cupcakes were left.	5	x = 9	36/1 = x/12 OR 1/36 = 12/x

CGI CHARTS:

With a few changes, Math Matters' CGI Chart is in New York State's Next Generations Learning Standards for Grade 3 and Grade 4 for use with multiplication and division word problems involving Equal Groups and Arrays and Area Problems.

Key Points:

- Allows students to solve the problem in a way they understand, instead of the "right" way.
    - **NY-3.OA.3 –** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.
        - E.g., using drawings and equations with a symbol for the unknown number to represent the problem.
    - **NY-4.NBT.5 –** 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.

Process:

1. ***Pick one word problem.*** Spend time on the process instead of a quick answer.
    - For Grade Band 3-4, the multiplication/division terms on the (English) CGI Chart have been updated to represent the Next Generation terminology changes.
        - The "Compare" row of addition/subtraction problems remains for use to practice addition and subtraction during the summer.
        - Use the STAR (Grade 3) ★ or the TRIANGLE (Grade 4) ▲ for types of word problems on the summer math assessments.
2. **Read the problem to students,** using the choice of differentiated numbers to fill in the blanks.
3. ***Read again and encourage students to take notes on the graphic organizer***. (modeling, teaching the first time)
4. ***Give students time to solve.*** (If struggling, prompt with, "What number does the problem start with?" Do you want to draw this or use manipulatives to recreate it?)
    a. Have manipulatives and paper for students to choose either medium for solving the problem.
5. ***Ask students to explain their process before asking them for an answer.*** This allows students time to self-correct and gives the Educator a clue about how the student is thinking.
6. ***At the end, look at the final answer together, to decide if it solves the problem***. How would you say this in a sentence?

Compare	*(Difference Unknown)* A nest of house mice ate ___ grains of rice and ___ crumbs. How many more crumbs did the mice eat than grains of rice? (99,103) (199,225) (64,202)	*(Bigger Unknown)* Mice will nest with their relatives. One nest had ___ deer mice. It had ___ fewer house mice than deer mice. How many house mice were in the nest? (43,17) (28, 19) (61, 47)	*(Smaller Unknown)* Mice will nest with their relatives. One nest had ___ deer mice. That was ___ more than house mice. How many house mice were in the nest? (34, 16) (23, 14) (57, 29)

	Unknown Product **a x b = ?**	**(Group Size Unknown)** **a x ? = p and p / a = ?**	**(Number of Groups Unknown)** **? x b = p and p / b = ?**
Equal Groups	A mouse had __ litters of babies (pups). There were __ pups in each litter. How many pups in all? (6, 7) (7, 8) (11, 14)	A mother mouse had __ babies (pups) over a period of time. There were __ pups in each litter. How many litters did the mother have? (56, 7) (72, 6) (125, 5)	A mouse eats 15 times a day *(true).* If it eats __ grains of rice each day, how many grains does it eat at each feeding? (45) (75) (150)

Unit 3 CGI Problems for *Monster in the Mattress and Other Stories*

Comparar	*(Diferencia desconocida)* Una nidada de ratones caseros comió ---- granos de arroz y ---- migas. ¿Cuántas más migas que granos de arroz comieron los ratones? (99, 103) (199, 225) (64, 202)	*(Cantidad desconocida)* Los ratones anidan con sus parientes. Un nido tenía ---- ratones ciervos. Este tenía --- menos ratones caseros que ratones ciervos. ¿Cuántos ratones había en el nido? (43, 17) (28, 19) (61, 47)	*(Referente desconocido)* Los ratones anidan con sus parientes. Un nido tenía ---- ratones ciervos. Esto era ---- más que ratones caseros. ¿Cuántos ratones caseros había en el nido? (34, 16) (23, 14) (57, 29)

	Multiplicación	**Medición de División**	**División Partitiva**
Agrupación y Partición	Una mamá ratona tuvo ---- camadas de bebés (cachorros). Había ---- cachorros en cada camada. ¿Cuántos cachorros en total? (6, 7) (7, 8) (11, 14)	Una mamá ratona tuvo ---- bebés (cachorros) en un periodo de tiempo. Había ---- cachorros en cada camada. ¿Cuántas camadas tuvo la madre? (56, 7) (72, 6) (125, 5)	Un ratón come 15 veces al día (verdadero). Si come ---- granos de arroz. Si come ---- granos de arroz cada día. ¿Cuántos granos de arroz come en cada comida? (45) (75) (150)

Math Objectives
- Construct pictorial models of fractions.
- Compare fractional parts of a whole.
- Use fraction names and symbols to describe fractional parts of a whole.
- Use pictorial models to generate equivalent fractions.
- Compare fractions using pictorial models.

Language Objectives
- Discuss fraction comparisons.
- Discuss fraction equivalencies.

Vocabulary
halves
thirds
sixths

Materials:
- 1 per student
- **BLM** Jerky Fractions (2 pages)
- **BLM (KEY)**

Per Partners:
- 6 pieces of jerky
- 2 paper plates
- 2 paper towels
- 2 scissors
- Chart paper with question**:** ***Tell what this statement means, whether it is true or false, and explain why***. **When you look at number representations of fractions without models, you have to imply that the "whole" they represent are the same size if you are going to compare them.** Put a copy of the record sheet at the top of the chart with the question.

Unit 3, Lesson 2 3-4

Snack Fractions

Children should wash their hands before this activity if using food items.

Snack Fractions
As part of each math day, please include a quick "Snack Fraction" activity. If your district/school does not allow any snacks to be given to students, please alter the activity by providing the paper shape to be divided into fractional parts.

Have students look at the two record sheets for this activity.
- What is similar to lesson 1, the dill pickle snack?
- What is different from lesson 1, the dill pickle snack?

Do look now at the snack.
- What do you have to share? (*six pieces of jerky*)
- Talk to your partner now about how you will share the snack fairly between you. When you have a plan, raise your hand and share your plan with me. (*Circulate the room listening to the partners' discussions. Let them share the jerky first, then continue with the rest of the activity.)*

(Ask of the whole class)
- How did you share your jerky between you?
- How was today's sharing different from Lesson 1, dill pickle?
- How do you know you each have half?

Work with the rest of the sharing and comparing you are asked to do on the record sheets. *(Circulate the room.)*
- What do you call one of these portions?
- How many of these portions make a whole?
- Which is larger (*compare two fractional portions)?*
- When you think about the fractional portion of the jerky, how does the NUMBER representation compare to the NUMBER representation?
- How would one-fourth compare to this fraction? How do you know? (*Compare to each of the fractional portions – only 1/2 is larger.*)
- Can you tell me a way that you can tell by looking at a number unit fraction representation, which fractional piece is larger?
- Show me how you found an equivalent fraction for 2/3.
- What would you call two of these pieces *(sixths)*? 3? 4? 5? 6?

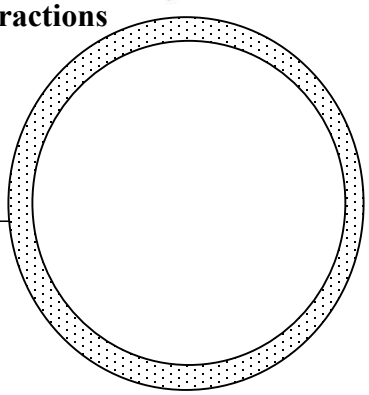
ELPS (*English Language Proficiency Standards*) 4C, 4F, 4G, 5A, 5B, 5C, 5G **CCRS** *(College and Career Readiness Standards)* **Math** VIII.A.1,2,3,4,5; VII.B.1,2; VIII.C.1,3; IX.C.1,2,3. **Cross-Disciplinary** I.D.1,2,3,4; I.E.1,2. **ELA** II.A.4.6,7, 10; II.B.1; II.D.1; IV.A.3	**Unit 3, Lesson 2** **3-4** **Snack Fractions -** continued **Snack Fraction Journal Writing: Jerky Chart Paper** *Tell what this statement means, whether it is true or false, and explain why.* **When you look at number representations of fractions without models, you have to imply that the "whole" they represent are the same size if you are going to compare them.** **Objectives:** Review the objectives with the class, making sure they understand how they achieved each.

BLM Unit 3, Snack Fraction Lesson 2 **KEY Jerky Fractions**
(One sheet per student)

My name is _____

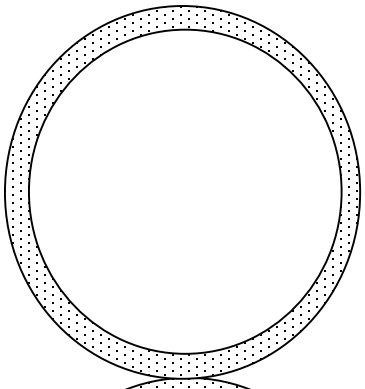
When I share with 1 other friend, my fraction part is ___*one-half*___
(word)

I can represent that fraction with numbers: _____.



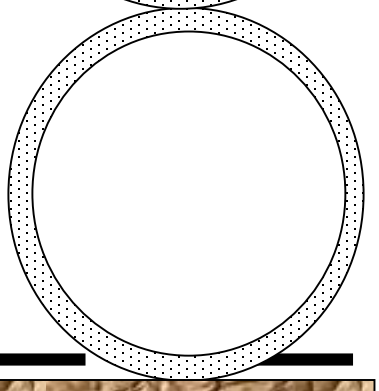
When I share with 2 other friends, my fraction part is __*one-third*___.
(word)

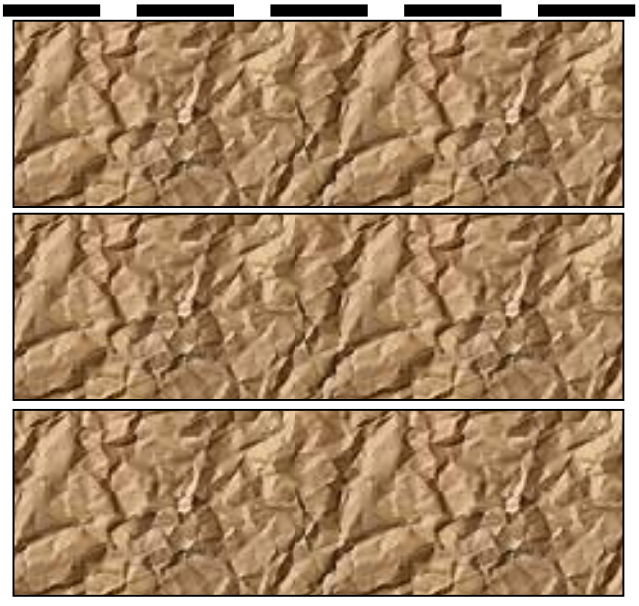
I can represent that fraction with numbers: _____.

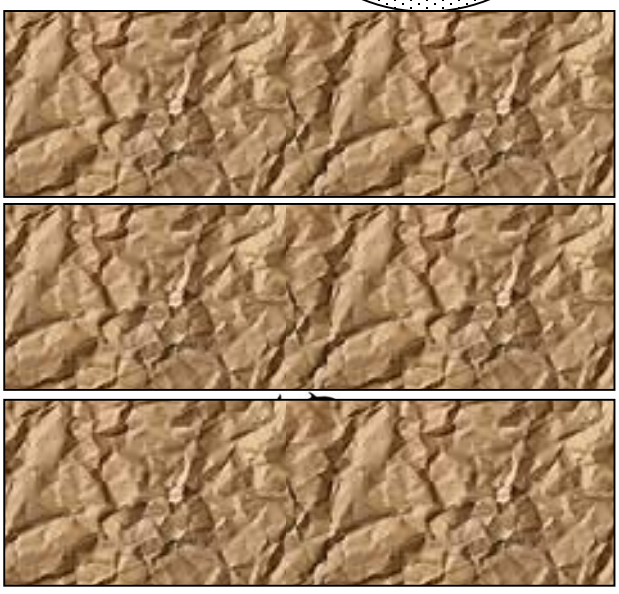


When I share with 5 other friends, my fraction part is __*one-sixth*
(word)

I can represent that fraction with numbers: _____.







First of all, compare the three unit fractions by writing the fractions in the rectangle and using < or > in the circle between the two fractions.
Students may arrange least to greatest OR greatest to least as long as the signs are correct.

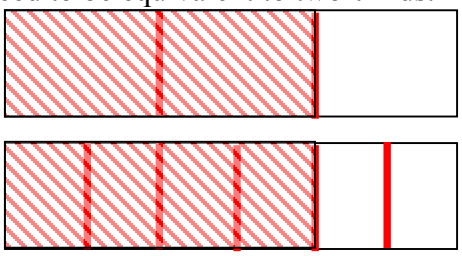
$\frac{1}{2}$ > $\frac{1}{3}$ > $\frac{1}{6}$

Circle the portion you would rather have.

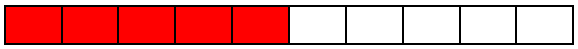
Explain why you would rather have the portion you circled.
I circled 1/6 because it's the smallest and I don't like jerky
(Students could choose either as long as
They can defend their choice.)

Now, use the 2 rectangles below to show how many sixths you would need to be equivalent to two-thirds.

$\frac{2}{3} = \frac{4}{6}$



Decimals
Divide the bar in half. Name each portion with a decimal.



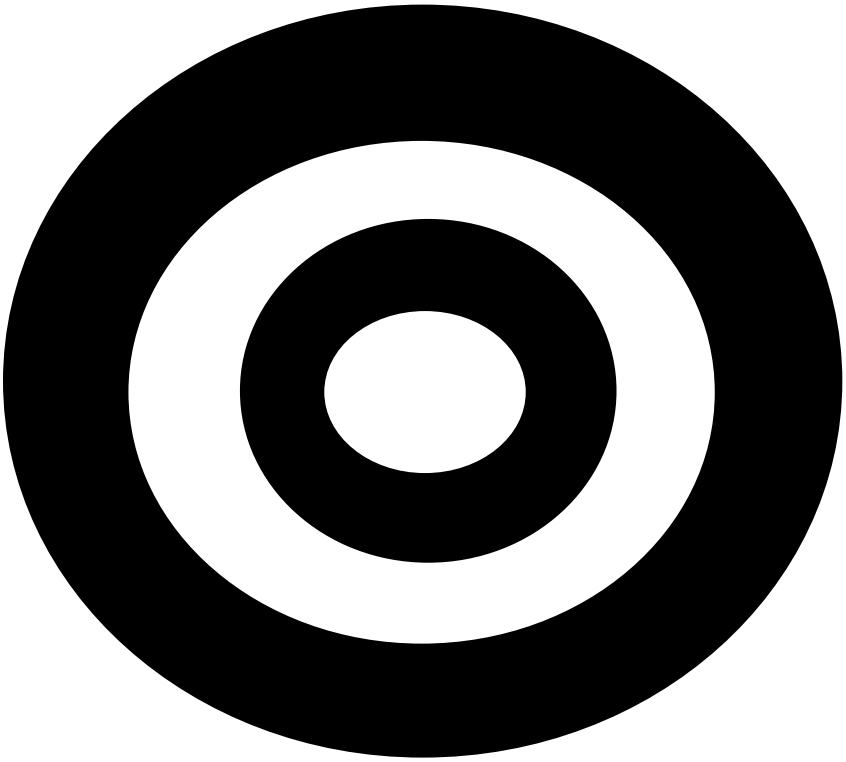
0.5 *0.5*

Summer Math

Student Packet/Paquete de alumno

Unit 3

English/Español



Target Number

BLM Unit 3, Follow-Up Lesson 3 **Family Fun Game Cards**

Printed on green cardstock –One set per partners for class; one set per student for home. (There are two pages of cards.)

A.
Write the fraction as a decimal.

Escribe la fracción como decimal.

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

B.
Write the fraction as a decimal.

Escribe la fracción como decimal.

$$\frac{6}{100}$$

C.
Write the fraction as a decimal.

Escribe la fracción como decimal.

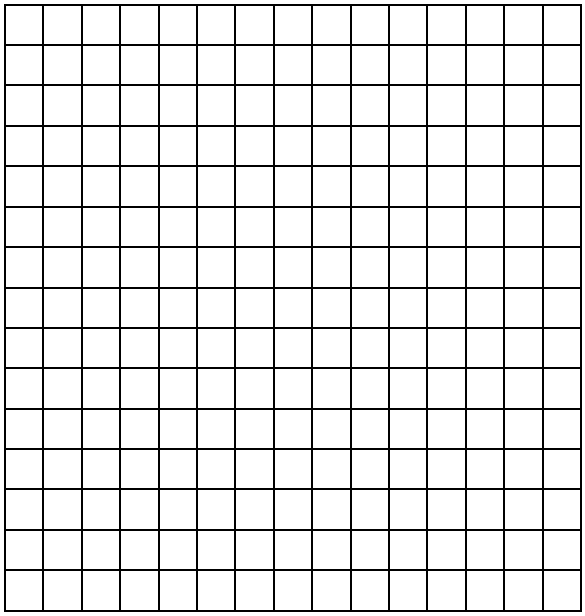
$$\frac{4}{10}$$

D.
Represent 13 x 13 using an array. Shade your answer on your grid paper.

Representa 13 x 13 usando un conjunto. Sombrea tu respuesta en tu papel de cuadrícula.

Solve 13 x 13 another way.

Resuelve 13 x 13 de otra manera.

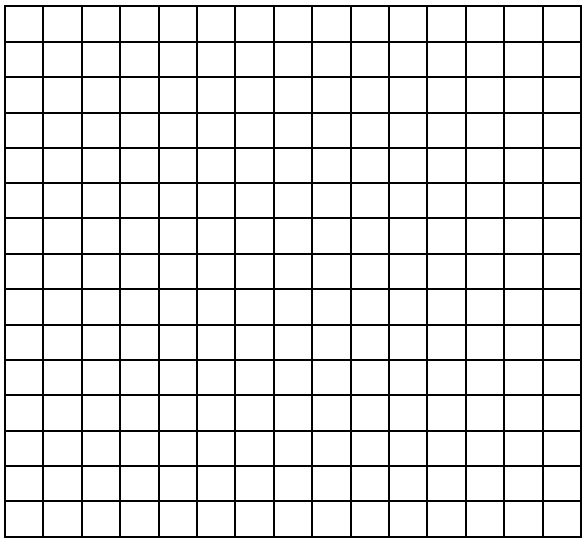


E.
Represent 11 x 13 using an array. Shade your answer on your grid paper.

Representa 11 x 13 usando un conjunto. Sombrea tu respuesta en tu papel de cuadrícula.

Solve 11 x 13 another way.

Resuelve 11 x 13 de otra manera.

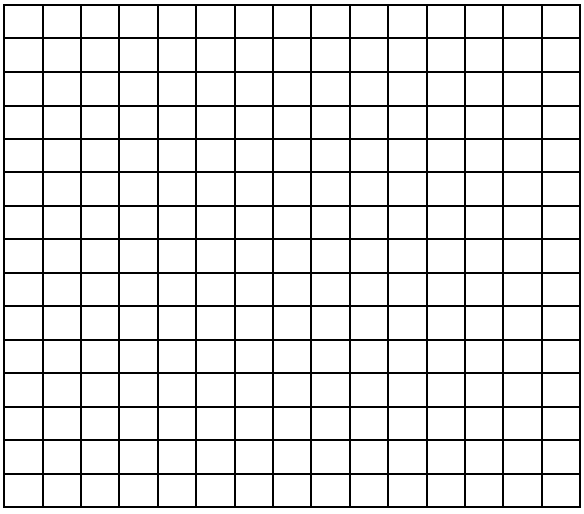


F.
Represent 13 x 15 using an array. Shade your answer on your grid paper.

Representa 13 x 15 usando un conjunto. Sombrea tu respuesta en tu papel de cuadrícula.

Solve 13 x 15 another way.

Resuelve 13 x 15 de otra manera.



BLM Unit 3, Follow-Up Lesson 3 **Family Fun Game Cards**

Printed on green cardstock –One set per partners for class; one set per student for home. (There are two pages of cards.)

G.

Arrange these decimals smallest to largest:

0.45 0.75

Arreglar los decimales de más pequeño a más grande.

H.

Arrange these decimals largest to smallest:

0.56 0.7

Arreglar los decimales de más pequeño a más grande.

I.

Arrange these decimals smallest to largest:

0.9 0.08

Arreglar los decimales de más pequeño a más grande.

J.

Which fraction is closest to

$\frac{2}{3}$**?**

$\frac{4}{6}$ $\frac{1}{2}$

¿Cuál fracción se aproxima más a

$\frac{2}{3}$**?**

K.

Which fraction is closest to

$\frac{5}{8}$ **?**

$\frac{1}{3}$ $\frac{1}{2}$

¿Cuál fracción se aproxima más a

$\frac{5}{8}$?

L.

Which fraction is closest to

$\frac{2}{8}$ **?**

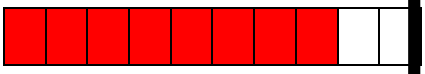
$\frac{1}{2}$ $\frac{1}{4}$

¿Cuál fracción se aproxima más a

$\frac{6}{8}$?

Printed on green cardstock –One set per partners for class; one set per student for home. (There are two pages of cards.)

M.



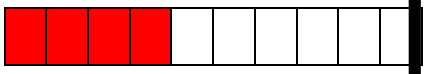
What fraction represents the shaded portion of the bar?

Write as a decimal.

¿Qué fracción representa la parte sombreada de la barra?

Escribe como un decimal.

N.



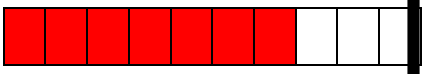
What fraction represents the shaded portion of the bar?

Write as a decimal.

¿Qué fracción representa la parte sombreada de la barra?

Escribe como un decimal.

O.



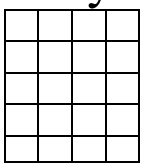
What fraction represents the shaded portion of the bar?

Write as a decimal.

¿Qué fracción representa la parte sombreada de la barra?

Escribe como un decimal.

P. Write the fact family for this array.



Escribe la familia de numeros para este conjunto.

Q.

$\square \div 6 = 4$

R.

$40 \div \square = 8$

BLM Unit 3, Follow-up Lesson 3 **Multiplication Matrix**
One per student for home use

Student Name: _____

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	38	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	122	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Write your unknown facts here.

CGI Graphic Organizer

(Notes)

Show your work:

Write an equation:

Answer: _____
(label)

Explain your strategy:

_____

_____

_____

_____

(Notes)

Show your work:

Write an equation:

Answer: _____
(label)

Explain your strategy:

_____

_____

_____

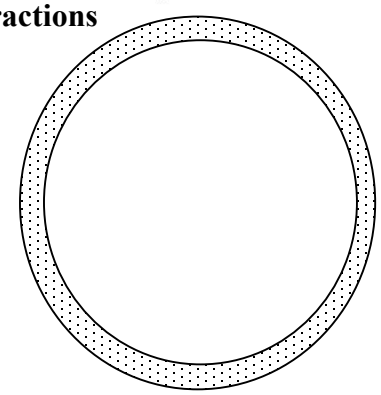
_____

BLM Unit 3, Snack Fraction Lesson 2 **Jerky Fractions**
(One sheet per student)

My name is _____

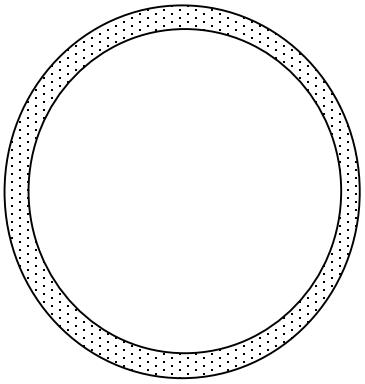
When I share with 1 other friend, my fraction part is _____.
(word)

I can represent that fraction with numbers: _____.



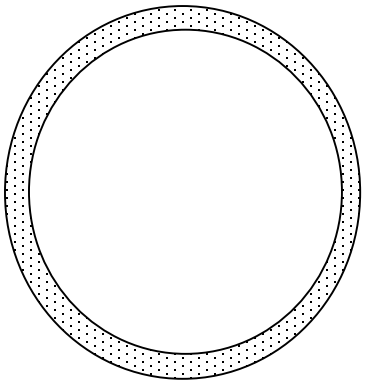
When I share with 2 other friends, my fraction part is _____.
(word)

I can represent that fraction with numbers: _____.



When I share with 5 other friends, my fraction part is _____.
(word)

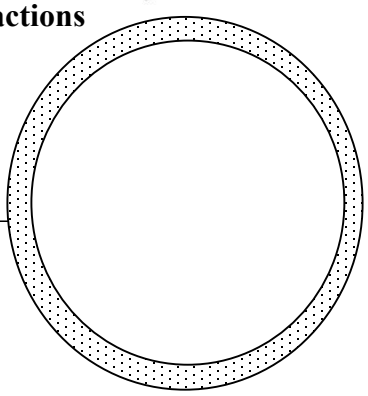
I can represent that fraction with numbers: _____.



BLM Unit 3, Snack Fraction Lesson 2 **Jerky Fractions**
(One sheet per student)

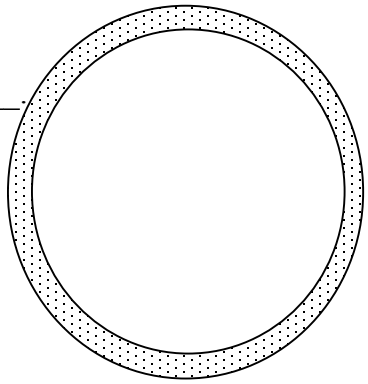
Mi nombre es _____

Cuando comparto con una persona mi porción fraccional es _____.
(palabra)



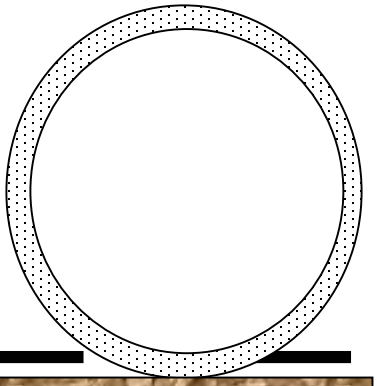
Puedo representar esta fracción con números: _____.

Cuando comparto con dos personas mi porción fraccional es _____.
(palabra)

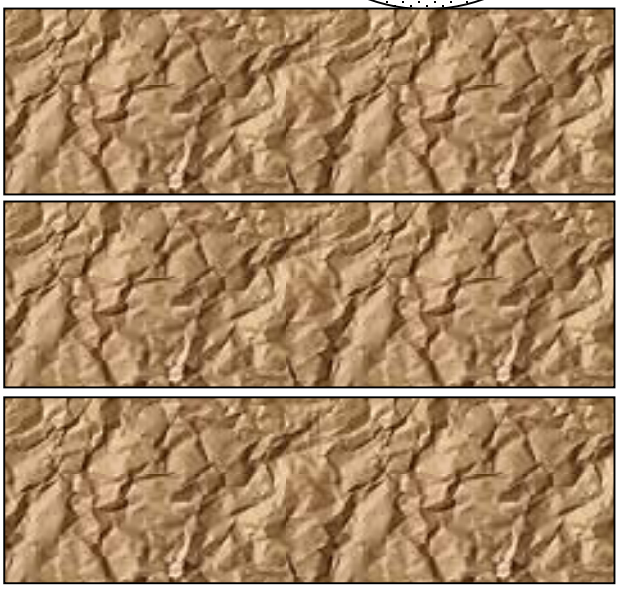


Puedo representar esta fracción con números: _____.

Cuando comparto con 5 amigos mi porción fraccional es _____.
(palabra)



Puedo representar esta fracción con números: _____.



BLM Unit 3, Snack Fraction Lesson 2 **Jerky Fractions**
(One sheet per student)

First of all, compare the three unit fractions by writing the fractions in the rectangle and using < or > in the circle between the two fractions.

Circle the portion you would rather have. _____ ◯ _____ ◯ _____

Explain why you would rather have the portion you circled.

Now, use the two rectangles below to show how many sixths you would need to be equivalent to two-thirds.

Decimals
Divide the bar in half. Name each portion with a decimal.

BLM Unidad 3, Fracciones de refrigerio Lección 2 **Fracciones de cecina**

(1 hoja por estudiante)

Antes que nada, compara las tres fracciones escribiéndolas en el rectángulo y usando < o > en el círculo entre ambas fracciones.

Circula la porción que preferirías tener. _____ ◯ _____ ◯ _____

Explica por qué preferirías tener la porción que circulaste.

Ahora, usa los 2 rectángulos siguientes para mostrar cuántos sextos necesitarías para que sean equivalentes a dos tercios.

Decimales
Divide la barra a la mitad. Nombra cada porción con un decimal.

Generic Family Fun Game Board

Materials Generic to All Units:

- Game Markers
- Game Cards for your Level
- Answer Key for your Level

Playing the Game

1. Begin in one of the corner shapes. There may be more than 1 player in each starting shape. Remember where you started.
2. On your turn, draw one of your level game cards and work the problem.
3. One of the other players uses the Answer Key to check your answer. If correct, roll the die and move ahead.

   If incorrect, do not move.

4. Game is over when the first person runs the entire track, ending back on the starting shape.

Tablero de juego

Materiales genéricos para todas las unidades:

- Fichas para jugar
- Tarjetas del juego para su nivel
- Clave de respuestas para su nivel

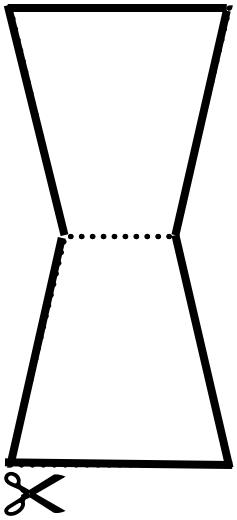
Cómo se juega

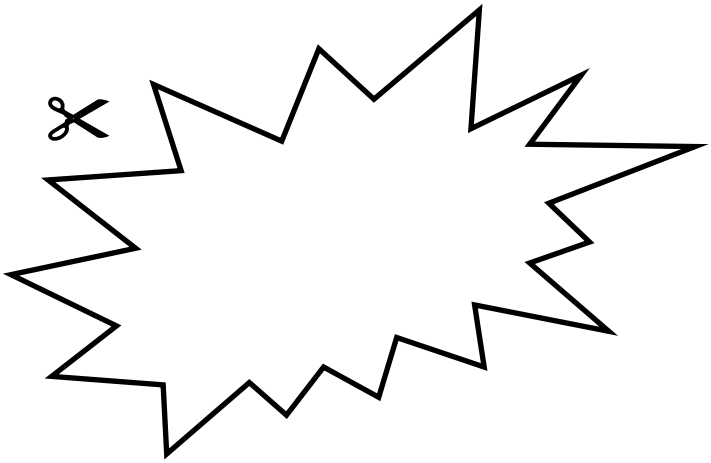
1. Empiece en una de las esquinas. Puede haber más de 1 jugador en cada figura de inicio.
2. Cuando sea su turno, saque una de las tarjetas de juego de su nivel y resuelva el problema.
3. Uno de los otros jugadores usa la clave de respuestas para ver si su respuesta es correcta. Si es correcta, tira el dado y sigue adelante.

   Si es incorrecta, no se mueve.

4. El juego se acaba cuando la primera persona recorre
toda la pista y termina en la figura de inicio.

Family Fun Game Pieces





1	2	3	4	5	6
6	5	4	3	2	1
4	5	6	1	2	3

Summer Math

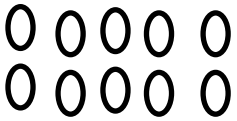
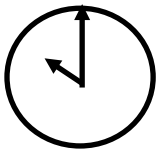
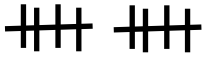
Educator Packet

Unit 4

Warm up: Target Number

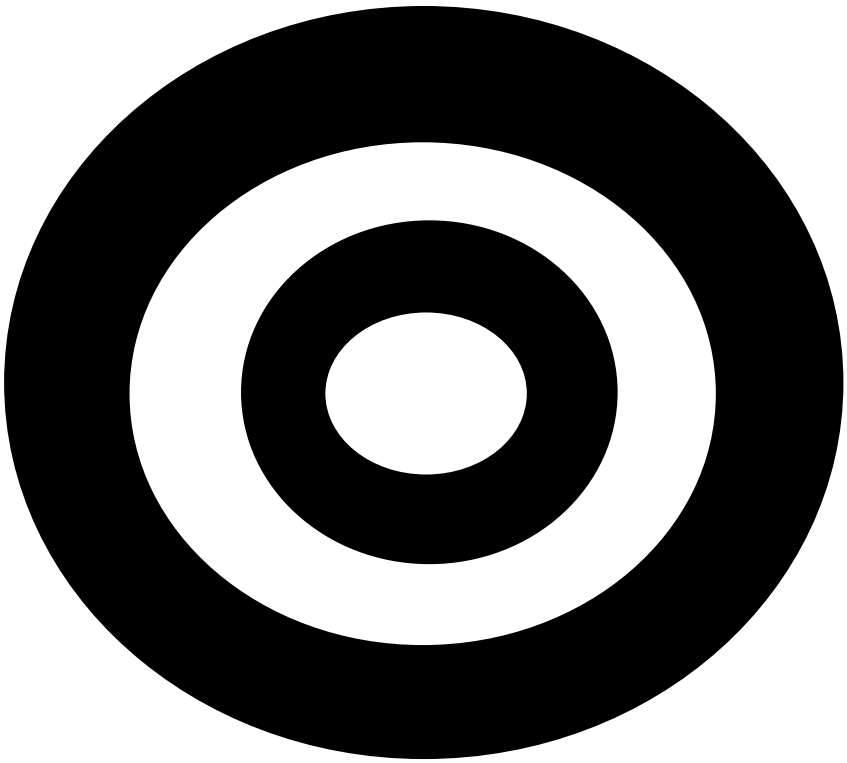
- The task is to represent the target number in different ways in one minute. Do a couple samples with students before starting the timer.
    a. Start all groups with the numbers 12 and 15.
        i. All target numbers are fair to use with students in grades 1 through 8.
        ii. Use numbers 20 and under for any "Cat-Icon" students in the group.
- Set the timer for one minute.
- Educators play along, and write examples to share related to the students' required math fluencies:
- At the end of the minute, students give ONE example at a time, going around the group a couple of times until all DIFFERENT responses are used. Students need to give **different** ways to represent the number. Writing, "7 + 3" is different from writing, "3 + 7". Drawing 7 circles and 3 circles is different from writing, "7 + 3."

Examples of some different ways to represent the number 10:

7 + 3	10 + 0	17 – 7	2 x 5	100 / 10	20/2
3 + 7	0 + 10	ten	5 x 2	10/1	10 x 1
					
One dozen eggs take away 2		2 + 2 + 2 + 2 + 2			100 - 90

Required [Math] Fluencies

Kindergarten	Add and subtract within 5	***Procedural Fluency***: can easily use a process to figure out the answer (for example, using manipulatives, diagrams)
Grade 1	Add and subtract within 10	***Procedural Fluency***
Grade 2	Single digit sums and differences (automaticity by the end of Grade 2); Add and subtract within 100	***Automaticity*** by the end of Grade 2: Knows the answer without stopping to use a process to figure out the answers.
Grade 3	Single digit products and quotients (product automaticity by the end of Grade 3)	***Automaticity for Products*** by the end of Grade 3
	Add and subtract within 1,000	***Procedural Fluency***
Grade 4	Add and subtract within 1,000,000	***Procedural Fluency***



Target Number

<u>Suggested Target Numbers</u>: Start with 12 and 15 for everyone for the first two sessions. Afterwards, numbers over 20 are fair for all grade bands except for the DOG ICON, which should just use numbers under 20**.**

12	15	24	36
60	48	100	45
90	50	75	

More choices: 9 18 6 20

FAMILY FUN GAME Directions

Key Points:

- Starting with Unit 2, the Family Fun Game gives students repeated practice in each of the Math Matters skills. This allows students to practice all of the skills throughout the summer.

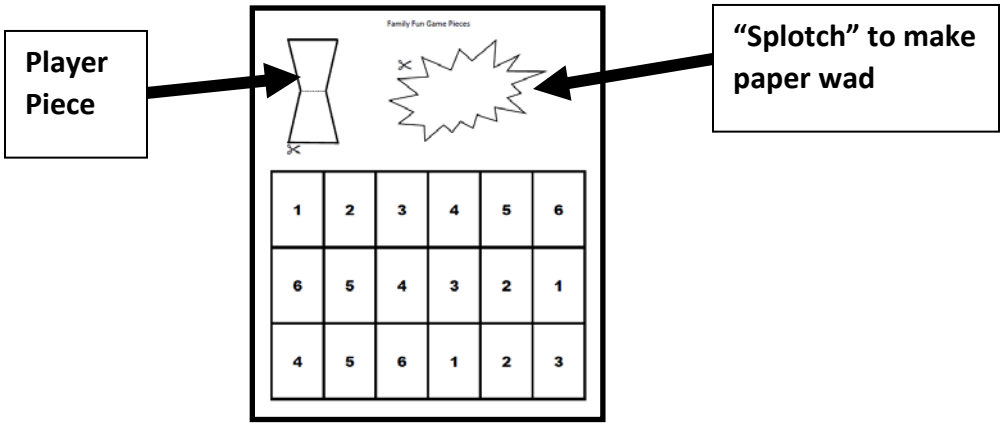
Process:

1. Each Student Packet has its own Family Fun Game Cards, allowing each student to participate with students who have different skills to practice.
2. Do not cut the cards apart! Starting with Lesson 2, the three cards in each row will practice the same skill.
3. Instead of students drawing a card, students select a problem from their grade band sheets. Students can select problems in the order they choose, BUT ask students to solve one problem from each row, before repeating from the row, so they practice each skill.
4. Game Directions are on the game board. Game boards are at the end of each Student Packet, so they are easy to pull off and use.
5. The best way to move around the board is to use dice. The Student Packets have a "Do It Yourself (DIY)" version to toss a small wad of paper onto a board of numbers.
6. Many students end up reading all of the problems in between turns as they search for the "best" ones to answer.

Do It Yourself (DIY) Game Pieces

Player: Cut the outside of the double trapezoid. Fold in half to make the player. If more than one student has the same color, students can write their names on the playing piece.

If you don't have a 6-sided die: Cut around the jagged "splotch" shape and wad the paper into a ball. Toss the ball onto the number board to find number of spaces to move.



BLM Unit 4, Follow-Up Lesson 3 Family Fun Game All Level Answer Key

Problem Letter	Kinder (pink)	1-2 (blue)	3-4 (green)	5-6 (yellow)	7-8 (peach)
A	14 ants	8 + 7 = 15 7 + 8 = 15 15 – 7 = 8 15 – 8 = 7	0.8	$6\frac{1}{4}$ or 6.25	3
B	4 eggs	5 + 7 = 12 7 + 5 = 12 12 -7 = 5 12 – 5 = 7	0.80	$\frac{5}{8}$ or 0.625 cups	6
C	7 brown	8 + 9 = 17 9 + 8 = 17 17 – 9 = 8 17 – 8 = 9	0.08	$423,294,920.10	4
D	Shows 10 counters Number 10	38	8	2134.448	scale factor 3
E	Shows 15 counters Number 15	23	63	$7400 down	scale factor 3
F	Shows 12 counters Number 12	38	49	10% water	fifth term 20
G	Penny	17	156 flowers	$48.50 tax	Length: 3078 mm Width: 1368 mm
H	Penny	4, 6 make ten	5 eggs	$33 late fee	Height: 0.64 feet
I	Dime	3,7 make ten	21 pounds	$375 earned	2.56 inches
J	2 pieces are the same size, fair	Path B is longer.	$4\frac{3}{4}$	$39.64	20 total candies
K	Cuts card in 2 equal pieces	Path A is shorter	$9\frac{1}{3}$	$12.20 tip	$157.50 total bill
L	Halves OR 1 out of 2 equal pieces	A is shorter than B. B is longer than A.	$99\frac{2}{4}$	25% tip	99 total chickens
M	13 drops of water	49 jelly beans	The 4 facts for 8x4=32	no. labels flipped	$57 sales price
N	3 thorns	35 fewer	The 4 facts for 6x9=54	yes. scale factor of (x6)	$31.25 sales price
O	10 miles	52 miles	7x8=56 8x7=56 56/7 = 8 56/8=7	60 students:1 bus	120 cookies
P	Set of 5 counters Set of 8 counters Mouse (8) had more	18 more	Equivalent to 1/3 can be 2/6 or 3/9 or 4/12....	30 notes hit	66 or 67 cents
Q	Set of 12 counters Set of 11 counters Lion (12) saw more	31 bananas	Equivalent to 1/2 can be 2/4 or 3/6 or 4/8....	$\frac{17}{12}$ or $1\frac{5}{12}$	$37.89 total cost
R	Set of 12 counters Set of 13 counters Mouse (13) saw more more	28 times	Equivalent to 1/4 can be 2/8 or 3/12 or 4/16....	$4\frac{1}{8}$	3 hours

CGI CHARTS:

With a few changes, Math Matters' CGI Chart is in New York State's Next Generations Learning Standards for Grade 3 and Grade 4 for use with multiplication and division word problems involving Equal Groups and Arrays and Area Problems.

Key Points:

- Allows students to solve the problem in a way they understand, instead of the "right" way.
    - **NY-3.OA.3 –** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.
        - E.g., using drawings and equations with a symbol for the unknown number to represent the problem.
    - **NY-4.NBT.5 –** 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.

Process:

1. ***Pick one word problem.*** Spend time on the process instead of a quick answer.
    - For Grade Band 3-4, the multiplication/division terms on the (English) CGI Chart have been updated to represent the Next Generation terminology changes.
        - The "Compare" row of addition/subtraction problems remains for use to practice addition and subtraction during the summer.
        - Use the STAR (Grade 3) ★ or the TRIANGLE (Grade 4) ▲ for types of word problems on the summer math assessments.
2. **Read the problem to students,** using the choice of differentiated numbers to fill in the blanks.
3. ***Read again and encourage students to take notes on the graphic organizer***. (modeling, teaching the first time)
4. ***Give students time to solve.*** (If struggling, prompt with, "What number does the problem start with?" Do you want to draw this or use manipulatives to recreate it?)
    a. Have manipulatives and paper for students to choose either medium for solving the problem.
5. ***Ask students to explain their process before asking them for an answer.*** This allows students time to self-correct and gives the Educator a clue about how the student is thinking.
6. ***At the end, look at the final answer together, to decide if it solves the problem***. How would you say this in a sentence?

Unit 4 CGI Problems for *The Classic Treasury of Aesop's Fables*

Compare	***(Difference Unknown)*** The stag had lots of points on his antlers. There were __ points on his left antler, and __ on his right antler. How many fewer points on the left antler than the right? (9, 12) (6, 11) (10, 13)	***(Bigger Unknown)*** Crow dropped __ small pebbles into the pitcher. He dropped __ more big pebble(s) than small pebbles. How many big pebbles did he drop into the pitcher? (118, 29) (47, 57) (197, 35)	***(Smaller Unknown)*** Crow has __ rough pebbles. He has __ more rough pebbles than smooth pebbles. How many smooth pebbles does Crow have? (102, 39) (211, 199) (112,79)

	(Unknown Product) **a x b = ?**	**(Group Size Unknown)** **a x ? = p and p /a = ?**	**(Number of Groups Unknown)** **? x b = p and p /b = ?**
Equal Groups	Crow was meticulous. He gathered his pebbles into ___ piles. He put ___ pebbles in each pile. How many pebbles did crow gather in all? (6, 7) (5, 6) (15, 16)	Crow was meticulous. He gathered ___ pebbles. He put ___ pebbles in each pile. How many piles did he have? (49, 7) (64, 8) (110, 11)	Crow was meticulous. He gathered ___ pebbles. He put them into ___ piles so that there was the same amount in each pile. How many pebbles in each pile? (36, 4) (42, 6) (243, 3)

Unit 4 CGI Problems for *The Classic Treasury of Aesop's Fables*

Compara	*(Diferencia Desconocida)* El ciervo tiene muchas puntas en sus astas. Había __ puntas en su asta izquierda, y __ en su asta derecha. ¿Cuántas puntas menos había en la izquierda respecto de la derecha? (49, 7) (64, 8) (110, 11)	*(Cantidad Desconocida)* El cuervo dejó caer __ piedras pequeñas en la jarra. Dejó caer __ piedra(s) grande(s) más que piedras pequeñas. ¿Cuántas piedras grandes dejó caer en la jarra? (49, 7) (64, 8) (110, 11)	*(Referente Desconocido)* El cuervo tiene __ piedras de superficie irregular. Tiene __ piedras de superficie irregular más que piedras de superficie lisa. ¿Cuántas piedras lisas tiene el Cuervo? (102, 39) (211, 199) (112,79)
	Multiplicación	**División de medidas**	**División partitiva**
Formación de grupos y Partición	El cuervo era meticuloso. Ordenó sus piedras en ___ pilas. Puso ___ piedras en cada pila. ¿Cuántas piedras juntó el cuervo en total? (6, 7) (5, 6) (15, 16)	El cuervo era meticuloso. Juntó ___ piedras. Puso ___ piedras en cada pila. ¿Cuántas pilas tenía? (49, 7) (64, 8) (110, 11)	El cuervo era meticuloso. Juntó ___ piedras. Las puso en ___ pilas para que hubiera la misma cantidad en cada pila. ¿Cuántas piedras había en cada pila? (36, 4) (42, 6) (243, 3)

Math Objectives
- Construct pictorial models of fractions.
- Compare fractional parts of a whole.
- Use fraction names and symbols to describe fractional parts of a whole.
- Use pictorial models to generate equivalent fractions.
- Compare fractions using pictorial models.

Language Objectives
- Discuss fraction comparisons.
- Discuss fraction equivalencies.
- Discuss fraction/decimal relationships.

Vocabulary
halves
fourths
eighths

Materials:
Per Student
- **BLM** Snack Bag Fractions
- **1 individual servings bag of 100 calorie snack**
- 8 lima beans

Per Partners:
- 2 paper plates
- 2 paper towels
- Chart paper with question**: How do you know that 3/4 = 6/8?**

ELPS (*English Language Proficiency Standards*)
2G, 3C, 3F, 4H

CCRS *(College and Career Readiness Standards)*
Math
I.A.1; I.C.1; IX.A.1,2,3;
IX.B.1,2;
IX.C.1
Cross-Disciplinary
I.B.1,2; I.C.1,2,3; I.D.1,2,3,4;
I.E.1,2

Unit 4, Lesson 2 — 3-4
Snack Fractions

Children should wash their hands before this activity if using food items.

Snack Fractions
As part of each math day, please include a quick "Snack Fraction" activity. If your district/school does not allow any snacks to be given to students, please alter the activity by providing the paper shape to be divided into fractional parts.

Today's snack fraction, although we will be practicing the same skills, is very different from others we have enjoyed.

First of all, each of you will have your own snack bag. This bag is sold "by the weight," and not by the individual number of pieces of snack that are in the bag. My first question to you is:

Did the snack bag give you and your partner fair shares, or halves, if we count PIECES of snack?

Please open your bags and compare your number of pieces in order to answer that question. (*Give them time to finish, and report back on their findings. As they are enjoying their snack, have them read through the BLM with you. This is similar to Lesson 1, except the amount shared is 8 rather than 16.)*

Snack Fraction Journal Writing: Snack Fraction Chart Paper
How do you know that 3/4 = 6/8?

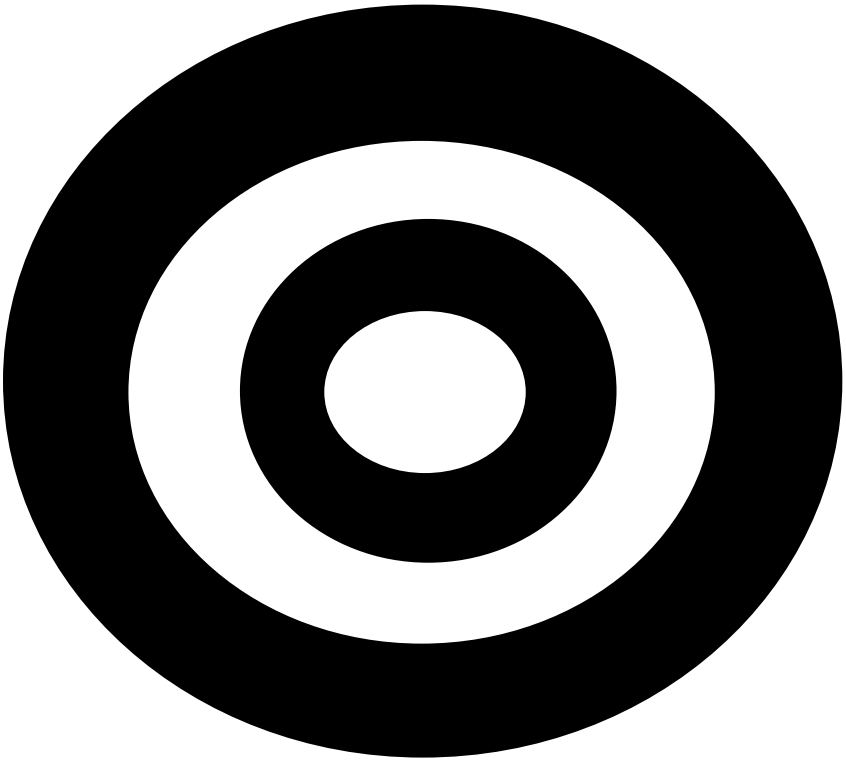
Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Summer Math

Student Packet/Paquete de alumno

Unit 4

English/Español



Target Number

BLM Unit 4, Follow-up Lesson 3 **Family Fun Game Cards**
Printed on green card stock –One set per partners for class; one set per student for home.

A.
Write the fraction as a decimal.

Escribe la fracción como decimal.

$\frac{8}{10}$

B.
Write the fraction as a decimal.

Escribe la fracción como decimal.

$\frac{80}{100}$

C.
Write the fraction as a decimal.

Escribe la fracción como decimal.

$\frac{8}{100}$

D.

___ x 7 = 56

E.

___ ÷ 7 = 9

F.

___ ÷ 7 = 7

G.
Daphne bought 12 vases of flowers. Each vase had a total of 13 flowers in it. How many flowers were there total?

Daphne compró 12 floreros. Cada florero tenía un total de 13 flores. ¿Cuántas flores había en total?

H.
Goose laid 35 golden eggs. They were divided equally into 7 boxes. How many eggs were in each box?

Ganso puso 35 huevos de oro. Se dividían igualmente en 7 cajas. ¿Cuántos cajas había en cada caja?

I.
Ellen's dog ate 3 pounds of dog food every week. How many pounds did the dog eat in 7 weeks?

El perro de Ellen comió 3 libras de comida para perros cada semana. ¿Cuántas libras comió el perro en 7 semanas?

Printed on green card stock –One set per partners for class; one set per student for home.

J.

Which number is closest to 5?

$4\frac{1}{4}$ $4\frac{3}{4}$

¿Qué número se aproxima más a 5?

K.

Which number is closest to 10?

$9\frac{1}{3}$ $9\frac{1}{6}$

¿Qué número se aproxima más a 10?

L.

Which number is closest to 100?

$99\frac{2}{4}$ $99\frac{2}{8}$

¿Qué número se aproxima más a 00?

M

Write the fact family for 8 x 4

Escribe la familia de hecho para 8 x 4

N

Write the fact family for 6 x 9

Escribe la familia de hecho para 6 x 9

O

Write the fact family for 7 x 8

Escribe la familia de hecho para 7 x 8

P.

Write the name of the other fraction equivalent to $\frac{1}{3}$

Escribe el nombre de la otra fracción equivalente a $\frac{1}{3}$

Q.

Write the name of the other fraction equivalent to $\frac{1}{2}$

Escribe el nombre de la otra fracción equivalente a $\frac{1}{2}$

R.

Write the name of the other fraction equivalent to $\frac{1}{4}$

Escribe el nombre de la otra fracción equivalente a $\frac{1}{4}$

CGI Graphic Organizer

(Notes)

Show your work:

Write an equation:

Answer: _____
(label)

Explain your strategy:

_____

_____

_____

_____

(Notes)

Show your work:

Write an equation:

Answer: _____
(label)

Explain your strategy:

_____

_____

_____

_____

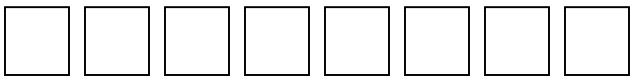
BLM Unit 4, Snack Fraction 2 **Snack Bag Fractions**
(One sheet per student)

Name _____

Suppose there were 8 snacks in your bag, and you were going to share with your little cousin.

Your little cousin only wanted $\frac{1}{4}$ of the bag.

1. Use the pictures to show your little cousin's portion and your portion.



2. Your cousin's portion is $\frac{1}{4}$ of the pieces. What is the equivalent fraction in eighths?

3. If your cousin's portion is $\frac{1}{4}$ of the snack, what fractional part is your portion?

4. What is the equivalent fraction for your portion in eighths?

Explain how you determined:

1. Your fractional portion of the snack:

2. The equivalent fractional portion in eighths for your part of the snack:

Would you rather have $\frac{1}{4}$ or $\frac{1}{8}$ of your favorite snack? _____ Why?

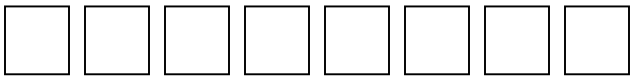
Name the UNshaded part of the bar.
Would this be greater than or less than 1/4?

BLM Unidad 4, Fracción de refrigerio 2 **Fracciones de bolsas de refrigerios**

Imagina que hay 8 refrigerios en tu bolsa, y que quieres compartirlos con tu primito.

Tu primito sólo quería $\frac{1}{4}$ de la bolsa.

1. Usa las imágenes para mostrar la porción de tu primito y tu porción.



2. La porción de tu primo es $\frac{1}{4}$ de las piezas. ¿Cuál es la fracción equivalente en octavos?

3. Si la porción de tu primo es $\frac{1}{4}$ de los refrigerios, ¿qué parte fraccional es tu porción?

4. ¿Cuál es la fracción equivalente a tu porción en octavos?

Explica cómo determinaste:

1. tu parte fraccional de los refrigerios:

2. la porción fraccional equivalente en octavos de tu parte de la carne:

¿Preferirías tener $\frac{1}{4}$ ó $\frac{1}{8}$ de tu refrigerio favorito? _____ ¿Por qué?

Nombra la parte SIN sombrear de la barra.
¿Esto sería más o menos que $\frac{1}{4}$

Generic Family Fun Game Board

Materials Generic to All Units:

- Game Markers
- Game Cards for your Level
- Answer Key for your Level

Playing the Game

1. Begin in one of the corner shapes. There may be more than 1 player in each starting shape. Remember where you started.
2. On your turn, draw one of your level game cards and work the problem.
3. One of the other players uses the Answer Key to check your answer. If correct, roll the die and move ahead.

   If incorrect, do not move.

4. Game is over when the first person runs the entire track, ending back on the starting shape.

Tablero de juego

Materiales genéricos para todas las unidades:

- Fichas para jugar
- Tarjetas del juego para su nivel
- Clave de respuestas para su nivel

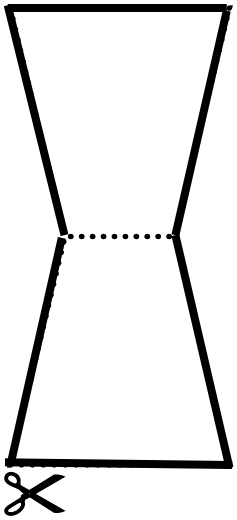
Cómo se juega

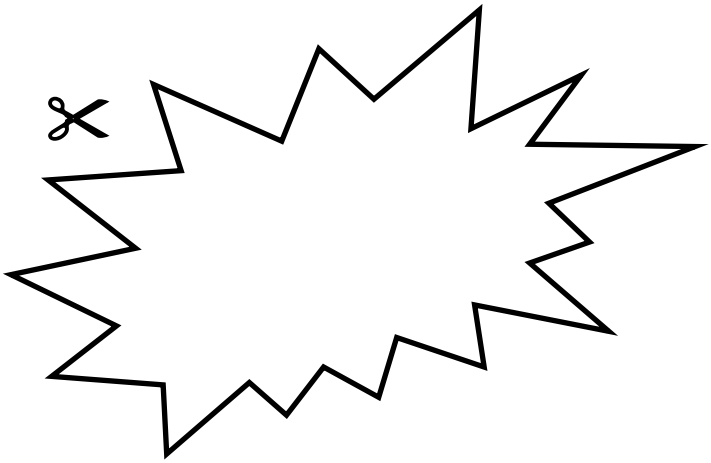
1. Empiece en una de las esquinas. Puede haber más de 1 jugador en cada figura de inicio.
2. Cuando sea su turno, saque una de las tarjetas de juego de su nivel y resuelva el problema.
3. Uno de los otros jugadores usa la clave de respuestas para ver si su respuesta es correcta. Si es correcta, tira el dado y sigue adelante.

   Si es incorrecta, no se mueve.

4. El juego se acaba cuando la primera persona recorre toda la pista y termina en la figura de inicio.

Family Fun Game Pieces





1	2	3	4	5	6
6	5	4	3	2	1
4	5	6	1	2	3

Summer Math

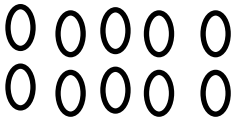
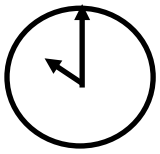
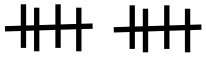
Educator Packet

Unit 5

Warm up: Target Number

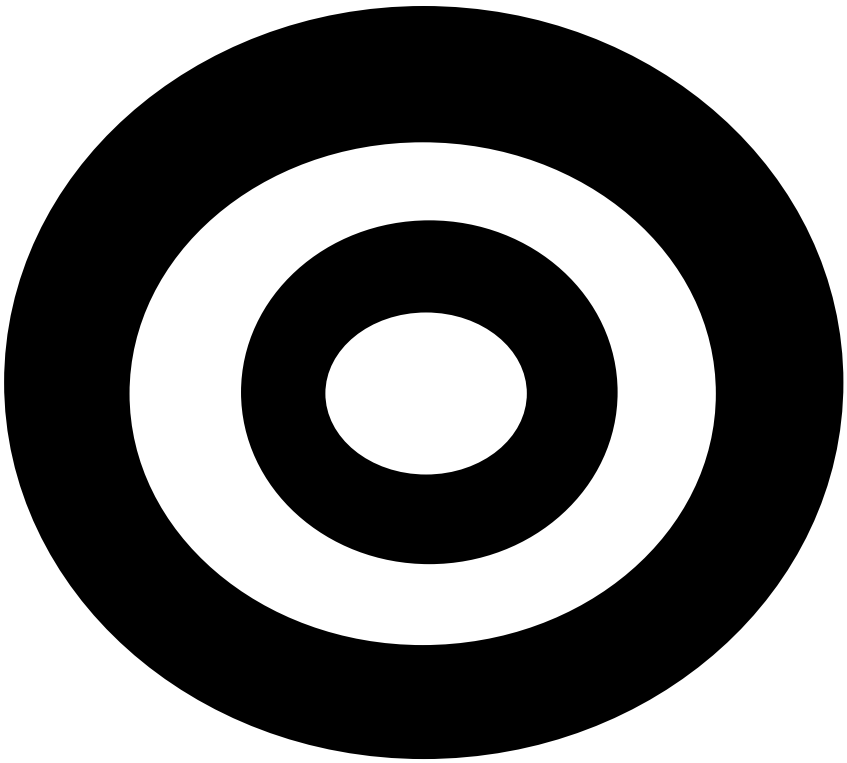
- The task is to represent the target number in different ways in one minute. Do a couple samples with students before starting the timer.
    a. Start all groups with the numbers 12 and 15.
        i. All target numbers are fair to use with students in grades 1 through 8.
        ii. Use numbers 20 and under for any "Cat-Icon" students in the group.
- Set the timer for one minute.
- Educators play along, and write examples to share related to the students' required math fluencies:
- At the end of the minute, students give ONE example at a time, going around the group a couple of times until all DIFFERENT responses are used. Students need to give **different** ways to represent the number. Writing, "7 + 3" is different from writing, "3 + 7". Drawing 7 circles and 3 circles is different from writing, "7 + 3."

Examples of some different ways to represent the number 10:

7 + 3	10 + 0	17 – 7	2 x 5	100 / 10	20/2
3 + 7	0 + 10	ten	5 x 2	10/1	10 x 1
					
One dozen eggs take away 2		2 + 2 + 2 + 2 + 2			100 - 90

Required [Math] Fluencies

Kindergarten	Add and subtract within 5	***Procedural Fluency***: can easily use a process to figure out the answer (for example, using manipulatives, diagrams)
Grade 1	Add and subtract within 10	***Procedural Fluency***
Grade 2	Single digit sums and differences (automaticity by the end of Grade 2); Add and subtract within 100	***Automaticity*** by the end of Grade 2: Knows the answer without stopping to use a process to figure out the answers.
Grade 3	Single digit products and quotients (product automaticity by the end of Grade 3)	***Automaticity for Products*** by the end of Grade 3
	Add and subtract within 1,000	***Procedural Fluency***
Grade 4	Add and subtract within 1,000,000	***Procedural Fluency***



Target Number

<u>Suggested Target Numbers</u>: Start with 12 and 15 for everyone for the first two sessions. Afterwards, numbers over 20 are fair for all grade bands except for the DOG ICON, which should just use numbers under 20**.**

12	15	24	36
60	48	100	45
90	50	75	

More choices: 9 18 6 20

FAMILY FUN GAME Directions

Key Points:

- Starting with Unit 2, the Family Fun Game gives students repeated practice in each of the Math Matters skills. This allows students to practice all of the skills throughout the summer.

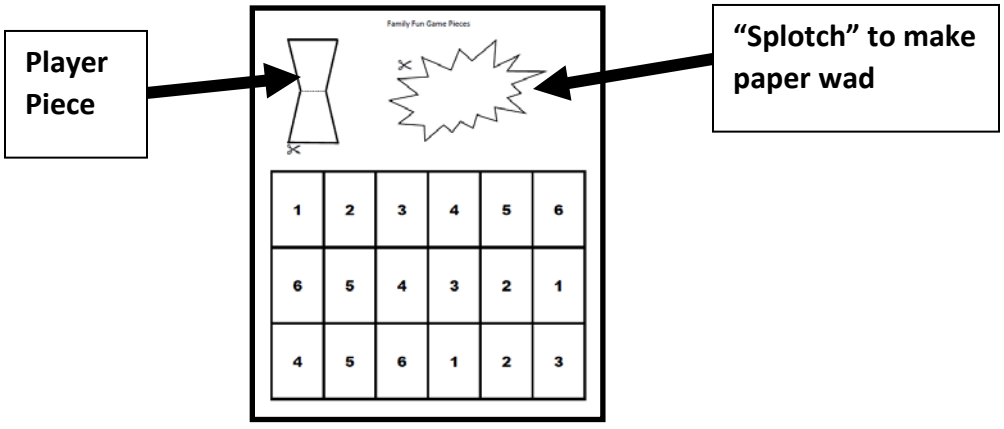
Process:

1. Each Student Packet has its own Family Fun Game Cards, allowing each student to participate with students who have different skills to practice.
2. Do not cut the cards apart! Starting with Lesson 2, the three cards in each row will practice the same skill.
3. Instead of students drawing a card, students select a problem from their grade band sheets. Students can select problems in the order they choose, BUT ask students to solve one problem from each row, before repeating from the row, so they practice each skill.
4. Game Directions are on the game board. Game boards are at the end of each Student Packet, so they are easy to pull off and use.
5. The best way to move around the board is to use dice. The Student Packets have a "Do It Yourself (DIY)" version to toss a small wad of paper onto a board of numbers.
6. Many students end up reading all of the problems in between turns as they search for the "best" ones to answer.

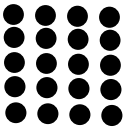
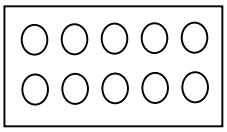
Do It Yourself (DIY) Game Pieces

Player: Cut the outside of the double trapezoid. Fold in half to make the player. If more than one student has the same color, students can write their names on the playing piece.

If you don't have a 6-sided die: Cut around the jagged "splotch" shape and wad the paper into a ball. Toss the ball onto the number board to find number of spaces to move.



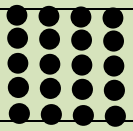
BLM Unit 5 Family Fun/Iguana Tales **TEACHER PAGES** (one of two pages) Answer key and what to color if you have the right answer.

	Problem	Suggested Strategy	Solution	Color in….
1	Find the sum of $42.50 and $37.49	algorithm	$79.99	2 of the 19 spines
2	A fraction equivalent to 0.5 is	Number sense	1/2 (or any equivalence)	½ of his legs (and the back leg counts)
3	Arrange least to greatest: 1 and 3/4 1 and 2/3	Number sense	1and 2/3, 1 and 3/4	His whole head (nose to the first body crease line)
4	Draw an array for 5 x 4	Technically, an array is as the solution depicts; but if they draw a grid, accept it.		6 of his tail segments
5	What's Missing? □ ÷ 7 = 9	Discuss this is part of a fact family. 7 x 9 - 63	63	5 of his body creases
6	42 balloons arranged in groups of 6. How many groups of balloons?	Draw the balloons	7 balloons	¼ of his legs
7	45 pennies in 9 stacks. How many pennies in each stack?	Divvy out drawings to 9 groups.	5 pennies	9 of his spines
8	3 more of these muffin pans.  How many muffins?	Draw rest of picture. Write number sentence	30 muffins	4 of his body creases
9	Write decimal for Two-hundredths: 2/100	Write it as you read it	0.02	8 of his tail segments
10	Write the decimal for this fraction: 3/4	Number sense benchmark	0.75	1 of his body creases
11	Create a number line and place the following on the line. 1/3 1/2	Draw number line. Decide between what whole numbers (0,1)	Finished number line	8 of his spines

BLM Unit 5, TV Lesson 2 **Iguana Tales** **TEACHER PAGES** (one of two pages)
One sheet per student TEACHER – These problems should be displayed one at a time on the board or Smart Board.

12	What's closest to 9? 8.09, 8.99	Number sense	8.99	¼ of his legs
13	What fraction represents the model? What decimal equals the fraction? 	Count parts of the whole.	1/4 = 0.4	Color in half of what is missing, OR if your iguana is done, create a big rock.
14	Write the equivalent decimal for $\frac{7}{100}$	Number sense	0.07	Color in the rest of what is missing, OR if your iguana is done, create grass around the iguana.

BLM Unit 5, Follow-Up Lesson 3 Family Fun Game All Level Answer Key

Problem Letter	Kinder (pink)	1-2 (blue)	3-4 Iguana Tales Specific information about strategies in 3-4 packets	5-6 (yellow)	7-8 (orange)
A	15 beans counted Number 15	2, 8 make ten	$79.99	0.5	8
B	9 beans counted Number 9	1, 9 make ten	1/2 (or any equivalence)	$8\frac{1}{8}$	10
C	10 beans counted Number 10	7 + 9 = 16 9 + 7 = 16 16 – 9 = 7 16 – 7 = 9	1and 2/3, 1 and 3/4	$0.01	0.12 cm
D	2 cicadas	8 + 7 = 15 7 + 8 = 15 15 – 7 = 8 15 – 8 = 7		1,111,111,110	87.5 feet OR 87.50 feet OR 87 ½ feet
E	8 mice	Last week: 12 miles This week: 11 Total:12+11=33miles	63	54.657 grams salt	$\frac{3\text{ ft}}{1\text{ yd}} = \frac{x\text{ ft}}{9\text{ yd}}$
F	9 leaves	David read 24 books.	7 balloons	11.92% chemical B	$\frac{16\text{ oz}}{1\text{lb}} \_ \frac{x\text{ oz}}{5\text{ lb}}$
G	Penny	14	5 pennies	$27.45 tax	$.26 OR 26 cents
H	Nickel	17	30 muffins	$350 tip	$0.40 OR 40 cents
I	Penny	13	0.02	$90 interest	$687.50
J	Top bar	one fourth OR One out of 4 equal pieces	0.75	$230 charged	$31.25
K	9 dots	Circle divided into 4 equal parts	Finished number line	3 cups cashews	3 hours
L	Bar on left	Lucy ate 4 cookies.	8.99	10% tip	4 hours
M	Must cut or tear card into approximately 2 equal pieces	Bob walked 4 miles.	1/4 = 0.4	False. Scale factor not consistent	$428
N	Halves, or 1 out of 2 equal pieces	7	0.07	True. Scale factor = (÷4) or($\times \frac{1}{4}$)	$1030.00
O	Both pieces are the same size	17		120 cotton balls: 1 bag	$18.34 or $18.35
P	7 flowers	65		48 babies	$59.34
Q	4 flowers	80		$\frac{12}{12}$ or 1 whole	200
R	0 frogs	85		$\frac{2}{15}$	96

CGI CHARTS:

With a few changes, Math Matters' CGI Chart is in New York State's Next Generations Learning Standards for Grade 3 and Grade 4 for use with multiplication and division word problems involving Equal Groups and Arrays and Area Problems.

Key Points:

- Allows students to solve the problem in a way they understand, instead of the "right" way.
    - **NY-3.OA.3 –** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.
        - E.g., using drawings and equations with a symbol for the unknown number to represent the problem.
    - **NY-4.NBT.5 –** 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.

Process:

1. ***Pick one word problem.*** Spend time on the process instead of a quick answer.
    - For Grade Band 3-4, the multiplication/division terms on the (English) CGI Chart have been updated to represent the Next Generation terminology changes.
        - The "Compare" row of addition/subtraction problems remains for use to practice addition and subtraction during the summer.
        - Use the STAR (Grade 3) ★ or the TRIANGLE (Grade 4) ▲ for types of word problems on the summer math assessments.
2. **Read the problem to students,** using the choice of differentiated numbers to fill in the blanks.
3. ***Read again and encourage students to take notes on the graphic organizer***. (modeling, teaching the first time)
4. ***Give students time to solve.*** (If struggling, prompt with, "What number does the problem start with?" Do you want to draw this or use manipulatives to recreate it?)
    a. Have manipulatives and paper for students to choose either medium for solving the problem.
5. ***Ask students to explain their process before asking them for an answer.*** This allows students time to self-correct and gives the Educator a clue about how the student is thinking.
6. ***At the end, look at the final answer together, to decide if it solves the problem***. How would you say this in a sentence?

Unit 5 CGI Problems for *My Mexico~Mexico mio*

Compare	*(Difference Unknown)* There were __ pounds of oranges and __ pounds of vanilla on the truck. How many more pounds of oranges than vanilla? (123, 77) (438, 99) (821, 687)	*(Bigger Unknown)* There were __ pounds of vanilla on the truck. There were __ more pounds of oranges than vanilla. How many pounds of oranges were there? (199, 27) (55, 275) (381, 49)	*(Smaller Unknown)* In the cargo truck there were __ pounds of coffee. That's __ more pounds of coffee than vanilla. How many pounds of vanilla are there? (75, 19) (123, 66) (620, 399)

	(Unknown Product) **a x b = ?**	**(Group Size Unknown)** **a x ? = p and p /a = ?**	**(Number of Groups Unknown)** **?x b = p and p /b = ?**
Equal Groups	There are __ corn stalks in a row of corn. There are __ ears of corn on one stalk. How many ears of corn in all? (8, 7) (30, 3) (14, 13)	A truck carrying oranges from Veracruz hauls __ bags of oranges. If there are __ bags of oranges in each crate, how many crates are there? (81, 9) (225, 5) (45, 3)	The children made __ adobe bricks. If they stack them in __ piles, how many bricks will be in each pile? (27, 3) (32, 4) (55, 5)

Unit 5 CGI Problems for *My Mexico~Mexico mio*

Compara	*(Diferencia Desconocida)* Había __ libras de naranjas y __ libras de vainilla en el camión. ¿Cuántas libras de naranjas más había en comparación con las de vainilla? (123, 77) (438, 99) (821, 687)	*(Cantidad Desconocida)* Había __ libras de vainilla en el camión. Había __ libras más de naranja que de vainilla. ¿Cuántas libras de naranjas había? (199, 27) (55, 275) (381, 49)	*(Referente Desconocido)* En el camión de carga había __ libras de café. Eso es __ libras más de café que de vainilla. ¿Cuántas libras de vainilla hay? (75, 19) (123, 66) (620, 399)

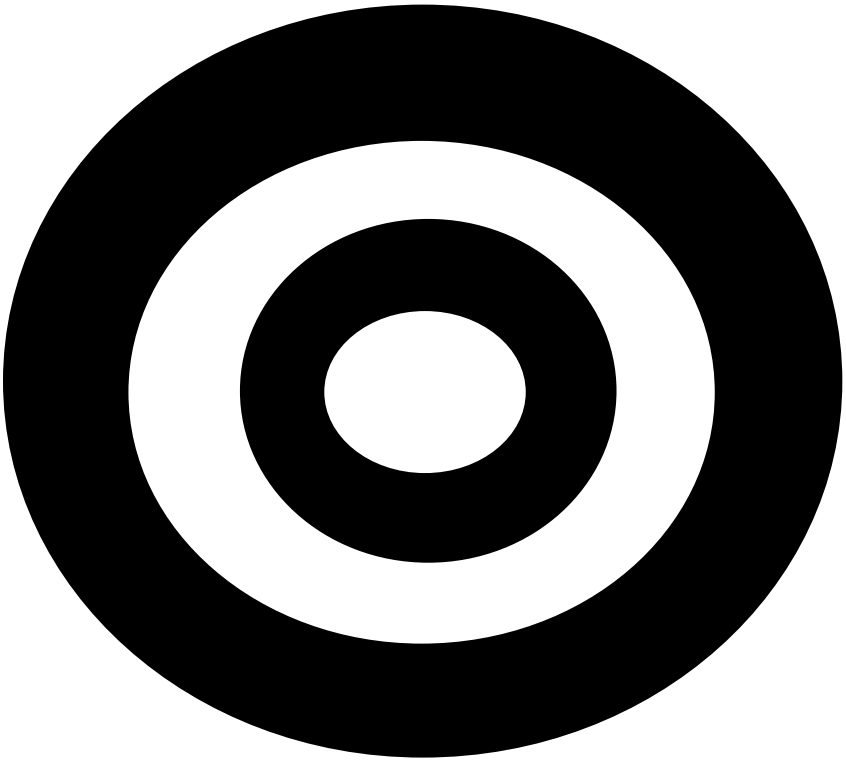
	Multiplicación	**División de medidas**	**División partitiva**
Formación de grupos y Partición	Hay __ plantas de maíz en una hilera de maíz. Hay __ mazorcas en una planta. ¿Cuántas son las mazorcas en total? (8, 7) (30, 3) (14, 13)	Un camión que transporta naranjas desde Veracruz transporta __ bolsas de naranjas. Si hay __ bolsas de naranja en cada cajón, ¿cuántos cajones hay? (81, 9) (225, 5) (45, 3)	Los niños hicieron __ ladrillos de adobe. Si los ordenan en __ pilas, ¿cuántos ladrillos habrá en cada pila? (27, 3) (32, 4) (55, 5)

Summer Math

Student Packet/Paquete de alumno

Unit 5

English/Español



Target Number

BLM Unit 5 **Family Fun/Iguana Tales Problem Cards** **TEACHER**

Duplicate on cardstock. Cut apart. Display these for students to see as you read them.

Find the sum of $42.50 and $37.49

Busca la suma de $42.50 and $37.49

Name a fraction equivalent to

Nombre una fracción equivalente a

0.5.

Arrange least to greatest:

Arregla de mínimo a máximo:

$1\frac{3}{4}$ $1\frac{2}{3}$

Draw an array for

Dibujo un conjunto por

5 x 4.

What's missing?

¿Qué falta?

$\square \div 7 = 9$

42 balloons arranged in groups of 6. How many groups of balloons?

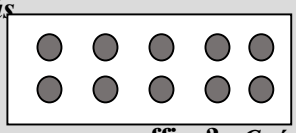
42 globos arreglados en grupos de 6. ¿Cuántos grupos de globos?

45 pennies in 9 stacks. How many pennies in each stack?

45 centavos en 9 montones. ¿Cuántos centavos en cada montón?

This muffin pan and 3 more.

Este molde de magdalenas y 3 más



How many muffins? ***¿Cuántas magdalenas?***

Write decimal for: Two-hundredths.

$\frac{2}{100}$

Escribe un decimal para: Tres y dos centésimos.

Write decimal for

Escribe el decimal para: $\frac{3}{4}$

Create a number line and place the following on the line:

Crea una línea numérica y coloca los números siguientes en la línea:

1/3 1/2

Which is closest to 9?

¿Qué número es más cerca a 9?

8.09 8.99

What fraction represents the model? Write the decimal.

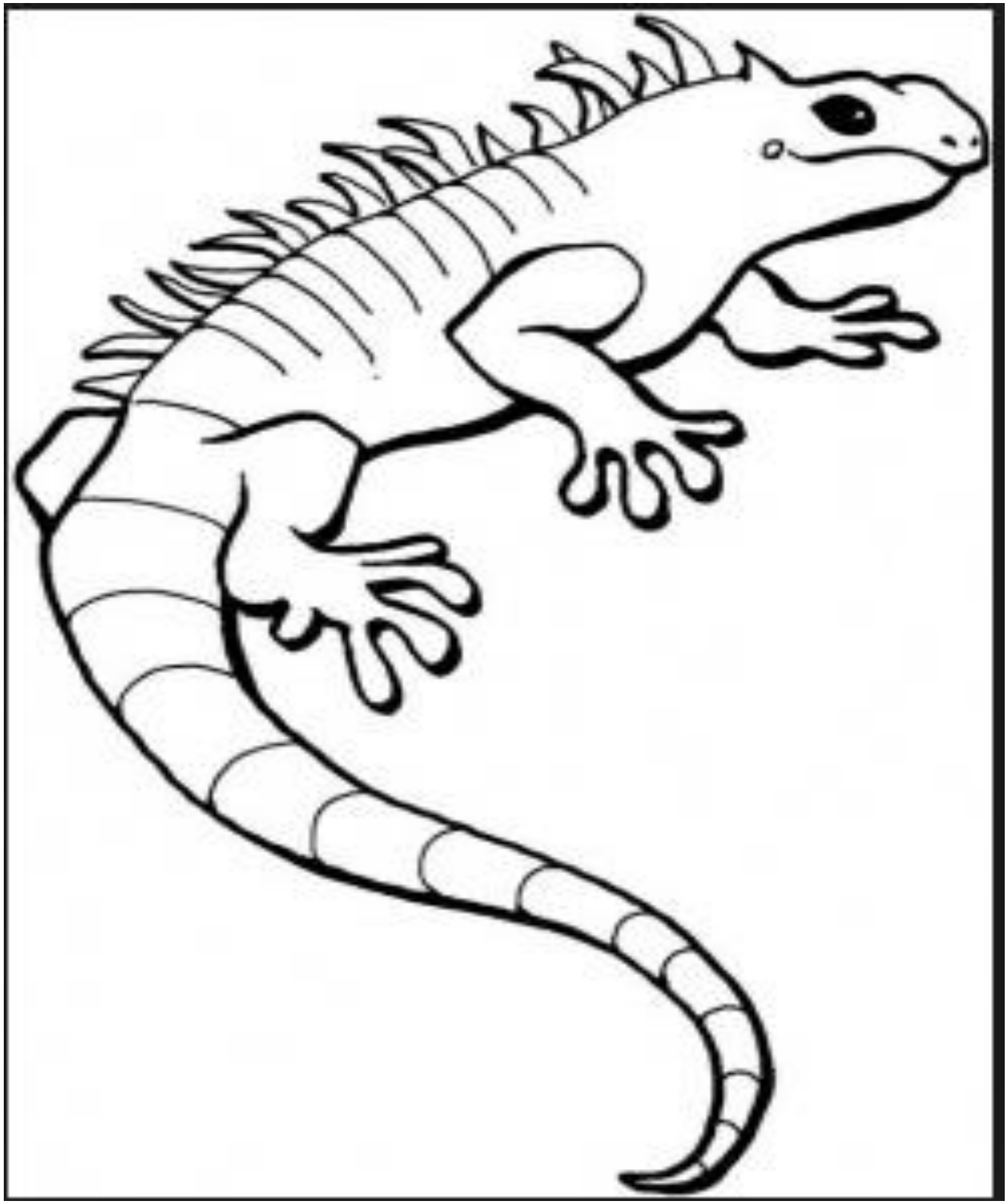
Qué fracción representa el modelo? Escribe el decimal.

Write the equivalent decimal for:

Escribe el decimal equivalente para:

$\frac{7}{100}$

BLM Unit 5, TV Lesson 2 **Iguana Tales Coloring**
One sheet per student



CGI Graphic Organizer

(Notes)

Show your work:

Write an equation:

Answer: _____
(label)

Explain your strategy:

_____

_____

_____

_____

(Notes)

Show your work:

Write an equation:

Answer: _____
(label)

Explain your strategy:

_____

_____

_____

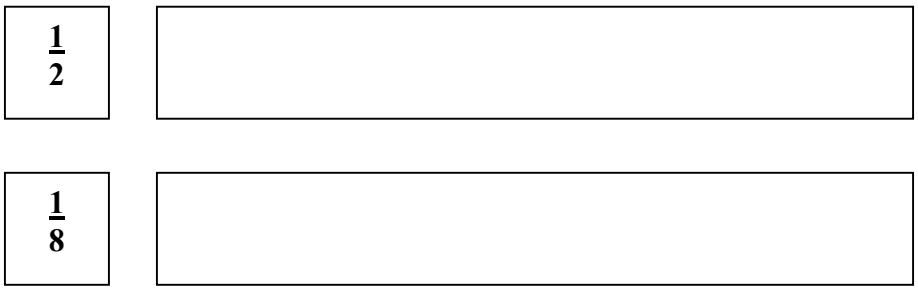
_____

BLM Unit 5, Snack Fraction **Crackers and Nutella Fractions**
(One sheet per student)

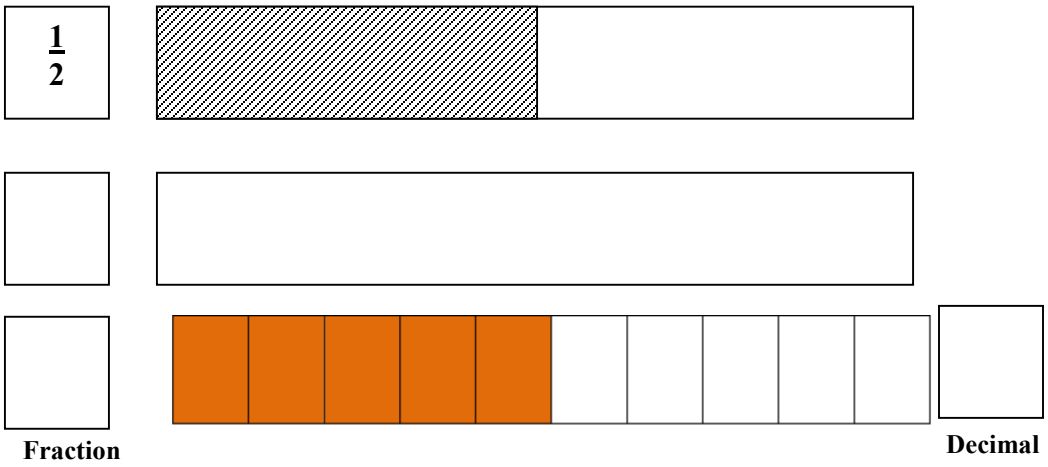
Name _____

These rectangles represent one of the Graham Crackers. Follow the directions to divide the rectangle and compare the pieces.

Which fractional piece of the Graham Cracker (rectangle) is larger?
Circle your answer.
Use pictures to verify your answer.



Use the picture below to find an equivalent fraction to one-half.



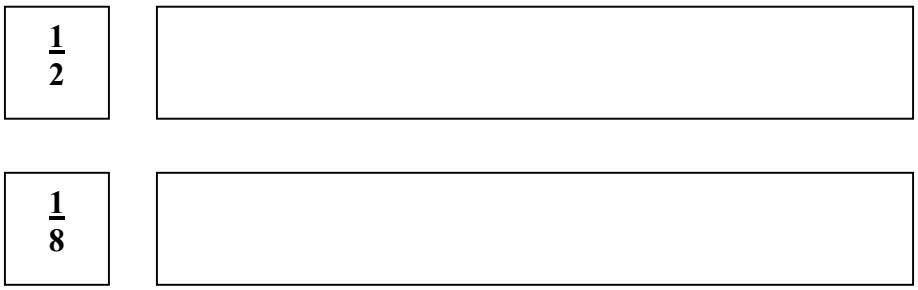
Write a comparison statement comparing your equivalent fraction to the shaded portion of the bar. (<, >, or =) _____ ◯ _____

BLM Unit 5, Snack Fraction **Crackers and Nutella Fractions**
(One sheet per student)

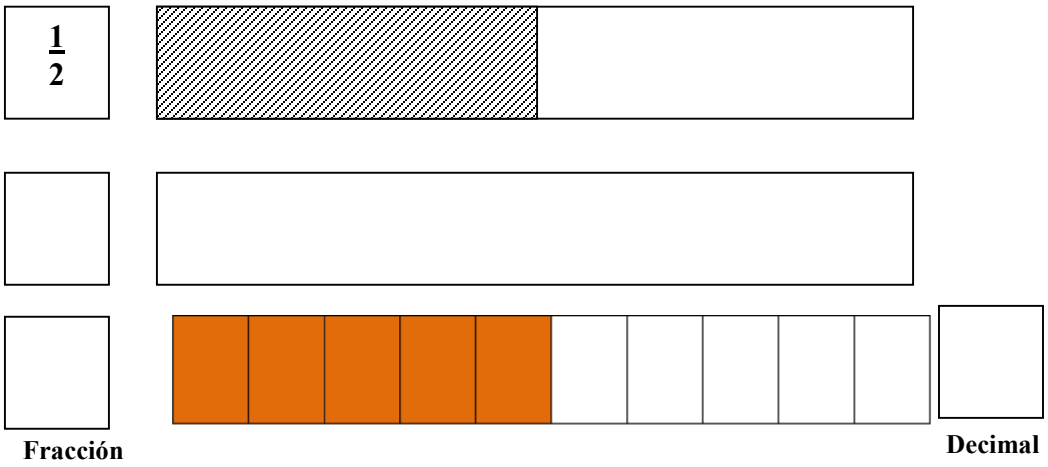
Name _____

Estos rectángulos representan una de las galletas. Sigue las instrucciones para dividir el rectángulo y comparar las piezas.

¿Qué parte fraccional de la galleta (rectángulo) es mayor?
Circula tu respuesta.
Usa dibujos para verificar tu respuesta.



Usa la siguiente imagen para encontrar una fracción equivalente distinta a un medio.



Escribe una oración para comparar tu fracción equivalente con la porción sombreada de la barra. (<, >, o =) _____ ◯ _____

Generic Family Fun Game Board

Materials Generic to All Units:

- Game Markers
- Game Cards for your Level
- Answer Key for your Level

Playing the Game

1. Begin in one of the corner shapes. There may be more than 1 player in each starting shape. Remember where you started.
2. On your turn, draw one of your level game cards and work the problem.
3. One of the other players uses the Answer Key to check your answer. If correct, roll the die and move ahead.

   If incorrect, do not move.

4. Game is over when the first person runs the entire track, ending back on the starting shape.

Tablero de juego

Materiales genéricos para todas las unidades:

- Fichas para jugar
- Tarjetas del juego para su nivel
- Clave de respuestas para su nivel

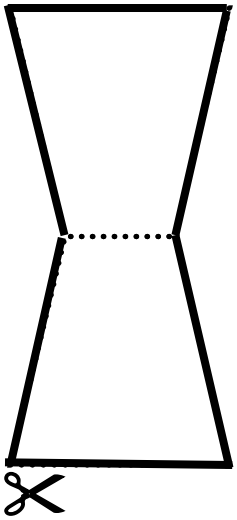
Cómo se juega

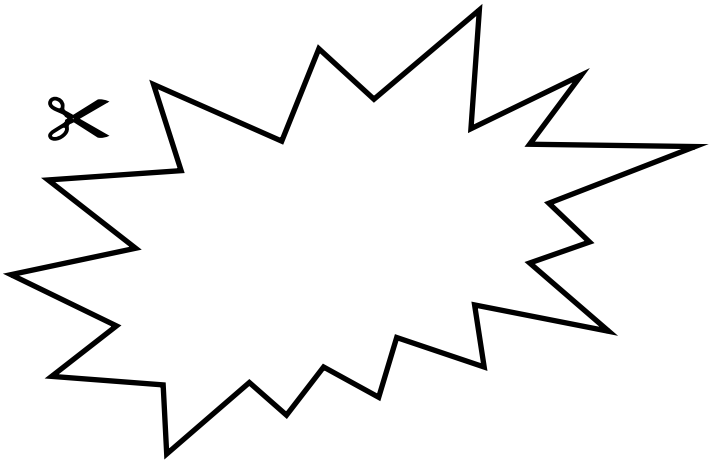
1. Empiece en una de las esquinas. Puede haber más de 1 jugador en cada figura de inicio.
2. Cuando sea su turno, saque una de las tarjetas de juego de su nivel y resuelva el problema.
3. Uno de los otros jugadores usa la clave de respuestas para ver si su respuesta es correcta. Si es correcta, tira el dado y sigue adelante.

   Si es incorrecta, no se mueve.

4. El juego se acaba cuando la primera persona recorre
   toda la pista y termina en la figura de inicio.

Family Fun Game Pieces





1	2	3	4	5	6
6	5	4	3	2	1
4	5	6	1	2	3

Literature Vocabulary
savanna
habitat
weather
lightning
burrows
shrubs

Math Vocabulary
factors
products
multiplication
division
fact family
area model
array model

Materials
- Portion cups – 12 per student
- 1 sheet dark construction paper
- Base ten units – 60 per student
- **BLM TM** – Multiple Ways to Multiply from TM Lesson

Time Clue
BB = 1 minutes
CI = 26 minutes
AC = **1** minute

ELPS (*English Language Proficiency Standards*)
1D, 1G, 2D, 2I, 3C, 3E, 3I

CCRS *(College and Career Readiness Standards)*
ELA
IV.A.3; IV.B.1,2,3; I.B.1; I.C.1; *II.D.1,2;*
Math
VIII.A.1,2,3,4,5; VII.B.1,2; VIII.C.1,3; IX.C.1,2,3.
Cross-Disciplinary
I.D.1,2,3,4; I.E.1,2.

Classroom Teachers
Please circulate the room to see that students are not having difficulty representing the problems.

Unit 2, Lesson 1 3-4

TV Lesson

Read objectives while pointing to the words in the math lesson objectives. After each math objective, show children what that means.

Math Objectives:
- Represent multiplication facts by using a variety of approaches, such as repeated addition, equal-sized groups, array and area models, equal jumps on a number line and skip counting.
- Model factors and products using area and array models.
- Represent multiplication and division situations in pictures, word and number form.

Language Objectives:
- Use the math vocabulary during the activity.
- Discuss solution strategies.

Building Background, Math
Multiplication is a great short cut! I'm sure you've already touched on multiplication during your regular school, but it's an important skill, so we're going to look at it in many different ways during this unit. You've already looked at repeated addition as another representation, and your Classroom Teacher introduced you to two more representations when she talked about the cookies and chocolate chips: same-sized sets and arrays. We'll work on all of those representations today, and we'll see what multiplication word problems look like, too.
Ok, let's get started.

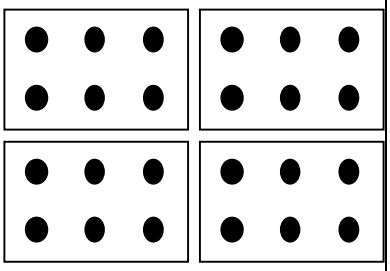
Comprehensible Input
I'd like to know your Classroom Teacher's baker friend. I'll bet those are great chocolate chip cookies. We're going to see just how she could use repeated addition, same-sized sets and the array model to figure out how many chocolate chips and how many cookies she has in her batches.

Let's look at your materials. These portion cups will represent the cookies. The base ten units will represent our chocolate chips, and the piece of construction paper will be our baking pan – it's just a way to keep our batches together. Let's work together now, please.

Let's say that the baker was trying out a new recipe and decided to bake a test batch of six cookies. When you bake cookies, you usually place the dough in tidy rows and columns with enough room for the dough to spread out during baking. Let's make two rows of three cookies. (*Do so, putting the portion cups in a 2 x 3 array on the construction paper "cookie sheet."*)

SMART BOARD Collect data on the board, but use the real materials for the cookie demo.	**Unit 2, Lesson 1** **3-4**  **TV Lesson** - continued Ok, give it a little time and the cookies bake *(ding – sound of timer)*; time to take out the cookies. *(Just leave the materials where they are.)* The baker places the chocolate chips in the cookies NOW. Let's say she wants to push five chips into each of the warm cookies. (*Count and drop 1, 2, 3, 4, 5 unit cubes into each portion cup.)* The question is, how many chocolate chips did she use? First, think of the Math Movie in your mind – Tell your classroom teacher what you are seeing boys and girls? You may use your models to explain, too *(pause).* **PIRATE**: Well, I see six cookies on a cookie sheet. And I see five big yummy chocolate chips pushed into each warm cookie! **TEACHER**: Excellent math movie, Capt. Portio. Did you see that too, boys and girls? Let's write than in the problem column on our record sheet. The cookies are our groups – so we have six groups. And there are five chocolate chips in each group. The problem then is six groups of five chips (*write in the problem column*). How can you figure that one out? Tell your teacher what you would do to figure the number of chips the baker used. *(pause)* **PIRATE:** Well, we could use repeated addition. That would be 5 + 5 + 5+ 5+ 5+ 5=. Hmm, I can skip count by 5s six times *(do so to 30 using fingers to keep track of the six cookies).* **TEACHER**: That's certainly a way, Capt. Portio. And we know that we could use a multiplication number sentence 6 groups of 5 translates to 6 x 5 which we now know equals 30. So 6 x 5 = 30. Remember that you have two FACTORS and one PRODUCT. Circle the factors in the number sentence, and underline the PRODUCT. Six and six are factors. 30 is the product of the two factors We have also created "same-sized" sets with our chocolate chips. We can draw a picture of those same-sized sets. What would you draw, boys and girls? Tell your Classroom Teacher. *(pause)*

TEACHERS:
All problems generate a MATH MOVIE. We are not talking joining or separating. We are talking about the images that appear in our minds when we read a word problem. No matter what type of problem you read, there is some sort of action taking place. Please encourage students to see that action.



TV Lesson - continued

PIRATE: I see, I could draw five little circles in one set, then draw that set a total of six times like this (*draw on the record sheet whether paper or Smart Board)*.

That gives me a picture of my Math Movie! Now I could count them one by one; or I could skip count by 5s; or if I know my multiplication tables, I can multiply 6 x 5. But the picture helps me see the number of chips and what the math movie is! There are still 30 chips (*count by 5s*).

TEACHER: Great job! Yes, we have just used another multiplication strategy, and that is to draw a picture of same-sized sets. And anytime you SEE a picture that has multiple sets of the same number in each set, you know you can multiply to find the answer!

Let's draw that picture on our record sheet in the "picture of same-sized sets" column (*do so*).

Now, suppose the baker had made four cookie sheets that looked exactly like this one (*refer back to the cookie sheet*). How many COOKIES would she have made?

First, what is our problem? What math movie do you see? Please tell your teacher what the problem is, or what math movie you see. Remember, the baker made FOUR cookie sheets that looked exactly like this one. (*pause*)

PIRATE: Well, I see four cookie sheets. On each sheet there are six cookies. So I would say the problem is four groups of six cookies.

TEACHER: Yes, that is the problem. There are four groups, or cookie sheets, with six cookies each. Let's write that on our record sheet. (*Write four groups of six cookies in problem column*).

We could represent that with repeated addition. 6+6+6+6. That's not so easy to skip count if you don't know your sixes. Let's record the repeat addition, and we'll leave the answer for a bit.

We could use our multiplication sentence. 4 x 6.
Hmm, but if you don't know your times tables, that could be a problem, too. So we only have the two factors here, don't we? Go ahead and circle the two FACTORS.

Unit 2, Lesson 1 3-4

TV Lesson - continued

Look at the cookie sheet. What we have created is an ARRAY. We have arranged those cookies in rows and columns. We call that an ARRAY. We can draw our cookie sheet array four times in the array model column. You'll have to draw small, though, to fit them all in. *(do so)*

Each one of those cookie sheets is and ARRAY. In fact, each is a two by three array (*focus on one cookie sheet, tracing the two horizontal ROWS when you say two, and the three vertical columns when you say three*).

I've put the four cookie sheets together to make a really big array. How many rows are there in this big cookie sheet? Let's count them (*four, tracing each horizontal row*) and how many columns do we have? (*six, tracing each vertical column as you count*). We still have our four groups of six. And we can see that we have 24 cookies now. That is our PRODUCT. You may write 24 as the product in the multiplication sentence – be sure to underline it!

When you have a set of rows and columns that like we do with these cookies, and the things inside the set are not touching, then you have an ARRAY.

What other things come in an ARRAY?

PIRATE: Well, eggs in a carton seem like they come like that.

SMART BOARD
In modeling other things that come in arrays, you can certainly have the REAL objects, and just use that for the discussion of the rows and columns; or you can have photographs on the SMARTBOARD, using the board to trace the rows and columns.

(Either the real thing and demo the dialog below with it, or show picture of eggs in a carton on Smart Board, then do all the following recording on the board, too.)

Yes, they do. These eggs *(referring to picture or real eggs in carton)* are in a two (rows) by six (columns) array. Let's record this example.

- What would our problem be for this egg carton? *(two groups of six)*
- And if we wrote that as repeated addition, what would we write? 6 + 6 = 12.
- What about a multiplication number sentence?
  Two groups of six is 2 x 6 = 12. FACTORS? PRODUCT?
- And we said this can be represented as an array. Let's draw this array *(do so).*

Can you think of something else you buy that might come in an array? Boys and Girls, can you tell your teacher something else that might come in an array? *(pause)*

Classroom Teachers:
You may need to complete the array investigation during the follow-up lesson. Please follow the same format that the TV Teacher has used to finish if necessary before the actual Follow-up practice.

PIRATE Corner
Unit 2 Lesson 1 - CGI
Tell us all the different strategies used today to solve your CGI problem. Share your class posters if you can.

Unit 2, Lesson 1 3-4

TV Lesson - continued

PIRATE: How about a six pack of soda? They would be an array.

TEACHER: Yes, a six pack of soda is also arranged in an array. *(Draw it, or show real six pack of soda.)*
Let's record that example:

- What is our problem? two groups of three
- How would you represent that as repeated addition? 3 + 3 = 6
- The multiplication sentence? 2 x 3 = 6 FACTOR? PRODUCT?
- Let's draw this array (*do so in the array model column*).

PIRATE: Oh, and I gave my Mom a box of chocolates. They were arranged in an array, too!

TEACHER: (*Real box of chocolates or photograph on SMART BOARD*) Yes, this box certainly is an array – it is a rectangular shape, and the candies inside are arranged in rows and columns. Take a close look at this array, boys and girls.

- What would be the problem if you are trying to figure how many candies are in this box? (*depends on the candy box*)
- Repeated addition number sentence?
- What about a multiplication sentence? *(create)* FACTORS? PRODUCT?
- And our array model?

There are many ways to represent multiplication, boys and girls. Can you name the ones we've worked with during this lesson? (*pause, then repeated addition, same-sized sets, array model, multiplication sentence*)

PIRATE: Well, and you used multiplication today during your Daily Routines. Where? In the CGI. *(Explain task.)*

TEACHER: Thank you! What kind of strategy did you use, boys and girls – we can't wait to see your posters and read your descriptions!

Objectives: And now before we go, let's review what we have learned today! *(do so)*

BLM Unit 2, Lesson 1
(One page per student)

Multiple Ways to Multiply

Problem/*Problema*	**Repeated Addition** *Adición repetida*	**Multiplication** *Multiplicación*	**Picture of Same-sized Sets** *Modelo de sets del mismo tamaño*	**Array Model** *Modelo de matriz*

Literature Vocabulary
savanna
habitat
weather
lightning
burrows
shrubs

Math Vocabulary
factors
products
multiplication
division
fact family
area model
array model

TV Materials:
- Student "Area Squares" BLM from Lesson 2
- 60 base ten units per student
- Metric ruler 1 per student
- **BLM** cm Graph Paper

Time Clue
BB = 1 minutes
CI = 26 minutes
AC = 1 minute

ELPS (*English Language Proficiency Standards*)
1D, 1G, 2D, 2I, 3C, 3E, 3I

CCRS (*College and Career Readiness Standards)*
Math
I.B.1; I.D.1; VIII.A.1,2,3,4,5; I.B.2; IX.A.1,2,3; IA.B.1,2; IX.C.1; X.A.1;
Cross-Disciplinary
I.C.1,2,3; I.D.1,2,3,4; I.E.1,2

Classroom Teachers
Please circulate the room to see that students are not having difficulty following directions.

Unit 2, Lesson 3 3-4

TV Lesson

Read objectives while pointing to the words in the math lesson objectives. After each math objective, show children what that means.

Math Objectives:

- Model factors and products using area and array models.
- Represent multiplication and division situations in picture, word, and number form.
- Use patterns and relationships to develop strategies to remember basic multiplication and division facts, such as fact families.

Language Objectives:

- Use the math vocabulary during the activity.
- Discuss solution strategies.

Building Background, Math

Let's take a look at our word wall to see which of our math vocabulary we have already seen demonstrated in the lessons. Boys and girls, tell your teacher which words we have already used in our lessons. (*Give them time: all but division.)*

Well, that just leaves one vocabulary word for us: division. And we are going to work with division today.

In Lesson 2 you used the area model to find the product of the number of rows in the rectangle times the number of columns in the rectangle. Let's take a look at the area poster that we did together – 3 cm by 5 cm.

(Remind students of the two rectangle dimensions, and of the multiplication number sentence that represents each.) And we wrote on our record sheet that the factor, factor, product of each of these rectangles is 3, 5, 15.

PIRATE: Yes, because the rectangles didn't change size. You just turned, or rotated the second one so it was tall and skinny instead of short and fat.

TEACHER: Just as these two rectangles are related, so are the number sentences. They are part of a family, a **fact family**, and we're going to find two more members of that family today.

TV Lesson - continued

Comprehensible Input
We can use these rectangles, the area model to find all sorts of information. We know that we can find the AREA, or how many squares it takes to fill up the inside of the shape, when we know the width and the length.

But we can also find a missing side measurement if we know the total area and the measure of the other side.

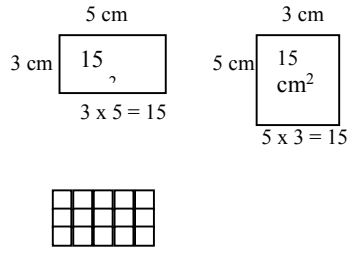
Let's try one.

Suppose we know that the area is 15. Let's use our base ten units to represent our area. Take your rulers and measure one face of the base ten cube. (*You do so, too.*) What does the face measure?

PIRATE: Oh, it's one cm by one cm.

TEACHER: Yes, it is. These base ten cubes are great for measuring area as long as we think about the top face that is facing us. So this becomes our unit of measure – the square on the top of this cube.

(*Put **one cube** on the construction paper under the 3 x 5 rectangle. You'll ultimately need space above the area model you're going to create to write the division number sentence. See model for ultimate placement.)*



Let's say that we do know the area is 15 cm^2, and we know that one side is 5 cm^2. We also know that the edge of our cube measures one cm, so we can count over enough using our base ten block five cm. (*Count from your one block over to a total of five, showing that you are using the edge to measure, and build the top row.)*

PIRATE: Oh, that's going to be easy. We know how to skip count by fives! We just keep building till we reach 15!

TEACHER: Right, Capt. Portio! We have built a rectangle now that is one cm wide and five cm long (*trace both measures with your finger or on the Smart Board*). What is the area of this rectangle? Tell your teacher, boys and girls *(slight pause)*. The area is 5 cm^2
We're not to 15 cm^2 yet, so let's keep building.

Build another row of base ten units under this one *(do so and have students do so)*. What are the dimensions of our rectangle now? *(pause)*

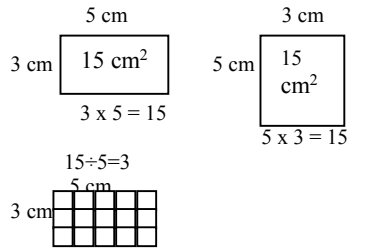
TV Lesson - continued

PIRATE: I see, this is a two cm by five cm, and the area is 10 cm^2.

TEACHER: Right, and we don't have our area of 15 cm^2 yet, do we? Build another row, and see what the dimension and the area are then *(pause)*.

PIRATE: The area is 15 cm^2. We did it! And now we know the measurement of the missing side. We built it – the missing measure is one cm, two cm, three cm long *(highlight the cm as you count)*.

TEACHER: Let's label our area model to show what we did. First we knew the area was 15 cm^2 and that the one side was five cm long *(label the five cm side)*.



We built our area model until we had all 15 square faces facing up at us, and we counted the cm on the missing measure side and found there were 3 cm *(label)*.

We just modeled a division problem. We took 15 cubes, divided them into groups of five, and found that we had three groups. Our division number sentence is 15 ÷ 5 = 3. *(Write this above the base ten model.)*

PIRATE: And there are those two factors and the product again, three, five, 15.

TEACHER: Right, Capt. Portio – this is a related fact. This is another part of the three, five, 15 multiplication / division fact family.

PIRATE: Then there must be one more. Can we find it?

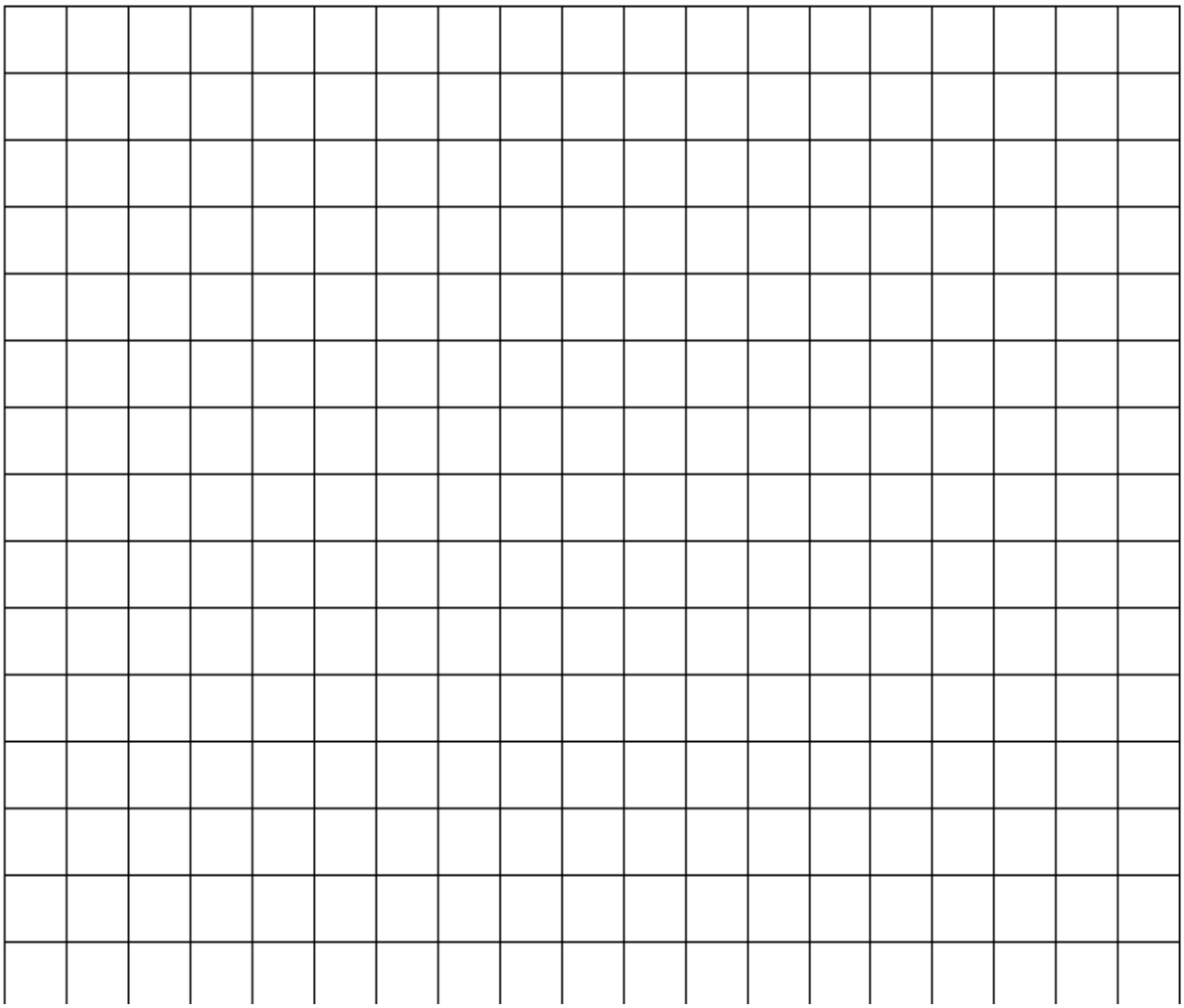
TEACHER: Sure – what is the area that we know? *(pause)* 15 cm^2, and this time, we'll have the information for the three cm side.

(*Work that one just as you did for the first one, only a little faster. Capt. Portio might not participate as much, but be sure you ask the students to conjecture as you go about what to do*.)

We now have our three, five, 15 fact family. Let's write those number sentence representations on the board *(do so).*

SMART BOARD **Classroom Teachers:** Your follow-up task is to complete the assignment. Students will need their other three area posters from Lesson 2. **Arthimus Portio's Corner** **Lesson 3 - Measurement** You used an area model and an array model today in your measurement lab. Probably you talked about the way the two strategies are alike and different. Share your thoughts with us.	**Unit 2, Lesson 3** **3-4** **TV Lesson** - continued During your follow-up lesson, you will find the division representations for the factor, factor, product fact family on the rest of your area posters. Practice this really well, boys and girls, because we are going to use a similar method very soon with base ten blocks to multiply and divide 2-digit numbers by 2-digit numbers! **PIRATE:** *(One of your "punny" remarks and explain the task.)* **Objectives:** And now before we go, let's review what we have learned today! *(do so)*

1 cm Graph Paper



Literature Vocabulary

Math Vocabulary
(repeated vocabulary)
factors
products
multiplication
division
fact family
area model
array model

Materials
If possible, have two different color base ten sets per the following:

- Base ten sets (product, or inside the frame) – 1 flat, 18 longs, 35 units per student
- Base ten sets (factors, or frame) –5 longs, 18 units per student

If you do not have two colors, make sure your students have a total of both sets in the color that you do have.

Time Clue
BB = 1 minutes
CI = 26 minutes
AC = **1** minute

ELPS (*English Language Proficiency Standards*)
2A, 2C, 2F, 2I, 3H, 3I, 3J, 4C

CCRS *(College and Career Readiness Standards)*
Math
VIII.A.1,2,3,4,5; VII.B.1,2; VIII.C.1,3; IX.C.1,2,3.
Cross-Disciplinary
I.D.1,2,3,4; I.E.1,2.
ELA
II.A.4.6,7, 10; II.B.1; II.D.1; IV.A.3;

SMART BOARD
Show models of arrays and corresponding algorithms.

Unit 3, Lesson 1 3-4

TV Lesson

Read objectives while pointing to the words in the math lesson objectives. After each math objective, show children what that means.

Math Objectives:

- Represent multiplication facts by using a variety of approaches, such as repeated addition, equal-sized groups, array and area models, equal jumps on a number line and skip counting.
- Model factors and products using area and array models.
- Represent multiplication and division situations in pictures, word and number form.

Language Objectives:

- Use the math vocabulary during the activity.
- Discuss solution strategies.
- Explain the relationship of the array model to the number representation of multiplication and division.

Building Background, Math

You've been visualizing multiplication; that is, seeing the math movie in multiplication problems. As you think about multiplication, what operation can you use to "undo" multiplication? *(division)*

We're going to work with array models today to see the connection between multiplication and division. This connection will lead us to fact families. Let's look at one family, a fact family of 1, 12, 12.

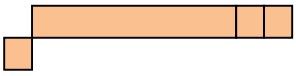
First, look at your base ten sets. Many of you may have two different colors. Separate those colors now. You have one color set of just five longs and 18 units. We're going to use these in an outside frame on our array building. Don't worry if you don't' have the two colors. We'll show you how to compensate. You have another set that has one hundred, 18 tens and 35 units. This set will be used to fill in the array.

Comprehensible Input

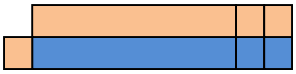
Suppose Millie had found egg cartons that held just the usual 12 eggs? Let's make an array to prove that one carton has 12 compartments in it. So our question is, how many compartments are there in one carton that holds a dozen eggs?

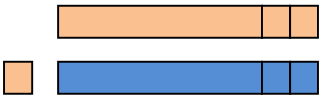
Classroom Teachers
Please circulate the room to see that students are not having difficulty representing the problems.

MAKING THE FRAME

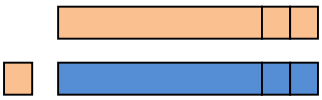


FILLNG THE FRAME





FACTORS and PRODUCTS



1 x 12 = 12

12 x 1 = 12

Unit 3, Lesson 1 3-4

TV Lesson - continued

MAKING THE FRAME

We know we have one carton. And that each carton has 12 compartments in it. What are the fewest base ten blocks that we can use to represent 12? *(pause)* (*One ten and two ones)*
Here is our frame. We are going to build an array inside this area. An array is a rectangle of rows and columns. This one has one row *(point or highlight the one unit)* and it has 12 columns *(highlight the columns)*.

FILLING THE FRAME

Let's fill the frame. What is the largest base ten block that can be used to begin to fill the frame? *(pause, a ten) (Place the ten rod.)* If you have your second color, please use that color to fill the frame. What other base ten blocks do we need to fill the frame? *(pause, two units) (place them)*

Now we have filled the frame. If you only have one color base ten blocks, pull your frame away. We only want to observe the filling.

- What number does the filling represent? *(pause)* Let's count it up.
- One ten and two ones.
- Do we need to make any trades? *(no)*
- That equals 12.

FACTORS AND PRODUCTS

We have created our frame using two numbers of the number family 1, 12, 12. The frame numbers are our FACTORS. The array that we built to fill the frame is the PRODUCT of our two FACTORS.

What number sentence could you write to represent our array as the product of two factors? *(pause)* When working with arrays and area models, we usually name the array as ROWS times COLUMNS. Let's use that mathematical understanding. We have one row. We have 12 columns. 1 x 12, and we know that the filling is 12 blocks. So 1 x 12 = 12.

That was very obvious, I know, but sometimes it's very helpful to start a new procedure with simple examples so you can really understand the relationships involved.

Now, if this array relationship represents 1 x 12 = 12, how could we show the relationship to the turn-around fact 12 x 1 = 12? *(pause)*

Rotate the whole model *(do so and ask students to do so)* and make a minor adjustment *(move the single unit to the top of the array)*. Now we see that our array shows us that we have 12 rows and one column. But our answer is still. . . Twelve.

TV Lesson - continued

REPRESENTING DIVISION

Suppose now that I knew I had a **total** of 12 compartments and I could see that I had 12 rows. What I didn't know is how many egg cartons I would have. I know, that is REALLY obvious, but let's work through that with our base ten model.

REPRESENTING DIVISION

I can start with the filling because I already know the TOTAL. *(Use the 12 out of the filling color.)* This is actually my product.

And I know that I have 12 rows, so I can use the 12 frame *(do so)*. This is actually one of my factors.

Now, I need the other factor. How many base ten blocks do I need to fill the frame? *(one unit – place it)* I now have my second factor.

What do the factors represent? *(Twelve represents the number of compartments in one egg carton; one represents the number of cartons.)*

12 ÷ 12 = 1

What does the product represent? *(the total number of compartments)*

And how can I represent in numbers what I just did? Talk to your teacher about that. *(pause)* This was a division problem. I had a total of 12 compartments *(point to the filling)*. So, if there are 12 compartments per carton, *(point to 12 in frame)* how many cartons did I have?

12 ÷ 12 = 1

12 ÷ 1 = 12

What if I knew I had a TOTAL of 12 compartments and that I had one egg carton? I would want to know how many compartments were in each carton. Now, I know the TOTAL, or product, of 12 *(show filling blocks)* and one carton, which is a frame or factor *(place one on the row)*. How many frame or factor blocks does it take to fill the top of the frame? Be sure to use the fewest number of blocks. *(12: one ten and two ones)*

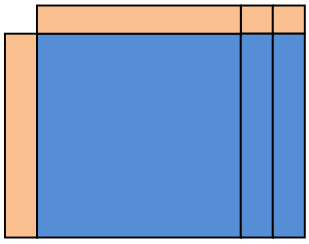
FACT FAMILY REPRESENTATION

We now have all four of the number sentences in our multiplication/division fact family for 1, 12, 12.

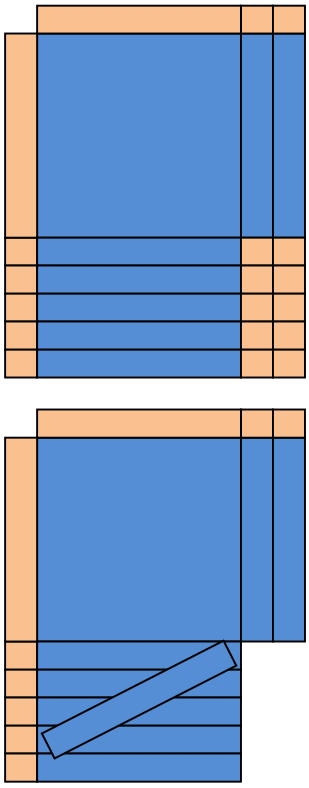
1 x 12 = 12 12 x 1 = 12
12 ÷ 1 = 12 12 ÷12 = 1

Let's try one a little more challenging. What if Millie Mouse had found 10 of those dozen-egg cartons?

10 x 12



15 x 12



Arthimus Portio's Corner
Lesson 1 - Graph
Which monster did your class select as the friendliest monster? Why do you think that is so? What makes the choice scarier than others on the graph?

Unit 3, Lesson 1 3-4

TV Lesson - continued

(Follow the same process, but Millie has 10 egg cartons with 12 compartments each. How many total compartments are there? (10 x 12) *You will have one hundred in each. Be sure you have asked, "What is the largest base 10 block you can use to start filling this frame?" The hundred block. And, of course, ask, "Do you have enough to make a trade?" (no) Count up the blocks:*
100 + 20 = 120 *10 x 12 = 120*

Millie had 15 egg cartons with 12 compartments each. How many total compartments are there? You will have trading in 15 x 12. Be sure that you ask each time, "Do we have enough to make a trade?"(yes) Take 10 units and trade for one ten. Place the ten across another group of tens. Count up the blocks. 100 + 80

It is critical that you work through this last problem with the students before the end of the lesson.

You'll be solving multiplication and division word problems, but also creating at least one of each.

Pirate: (Discuss the Pirate's Corner task.)

Objectives: And now before we go, let's review what we have learned today! *(do so)*

Literature Vocabulary
mystery
clever
invention
wire
spring (3 different meanings)
mattress
brave

Math Vocabulary
(repeated vocabulary)
factors
products
multiplication
division
fact family
area model
array model

Materials
If possible, have two different color base ten sets per the following:
- Base ten sets (product, or inside the frame) – 1 flat, 18 longs, 35 units per student
- Base ten sets (factors, or frame) – 5 longs, 18 units per student

If you do not have two colors, make sure your students have a total of both sets in the color that you do have.
- **BLM**– Monster Problems – 1 per student
- **BLM –** Division Description 1 for teacher

Time Clue
BB = 1 minutes
CI = 26 minutes
AC = **1** minute

ELPS (*English Language Proficiency Standards*)
2A, 2C, 2F, 2I, 3H, 3I, 3J, 4C

CCRS *(College and Career Readiness Standards)*
Math
VIII.A.1,2,3,4,5; VII.B.1,2; VIII.C.1,3; IX.C.1,2,3.
Cross-Discplinary
I.D.1,2,3,4; I.E.1,2.
ELA
II.A.4.6,7, 10; II.B.1; II.D.1; IV.A.3

Unit 3, Lesson 2 3-4

TV Lesson

Read objectives while pointing to the words in the math lesson objectives. After each math objective, show children what that means.

Math Objectives:
- Model factors and products using area and array models.
- Represent multiplication and division situations in pictures, word and number form.
- Relate the model to the partial product and traditional algorithm.

Language Objectives:
- Use the math vocabulary during the activity.
- Discuss solution strategies.
- Explain the relationship of the array model to the number representation of multiplication and division.

Building Background, Math
Let's use what we've learned about multiplying 2-digit by 2-digit numbers to solve word problems. We've also taken a look at finding the missing factor, or dividing, using the array model. Some of the problems we'll solve will be multiplication; others will be division. As with all word problems, there is a math movie to see which will guide you to the action in the problem – join or separate. I'll ask you to tell your teacher what math movie you saw. Use my brief pause to quickly discuss the action.

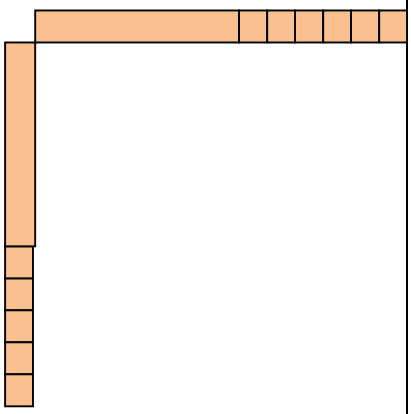
So here is our process:
- Read through the problem with me and watch for the math movie.
- Describe the math movie to your Classroom Teacher and class.
- Create an array or area model to solve the problem.
- Regroup as needed to write a numerical representation of the product.
- Connect the model to the traditional algorithm.

PIRATE: Hey, wait a minute! We haven't really connected the model to the, the, the, al-go-ri-thm. What is that anyway?

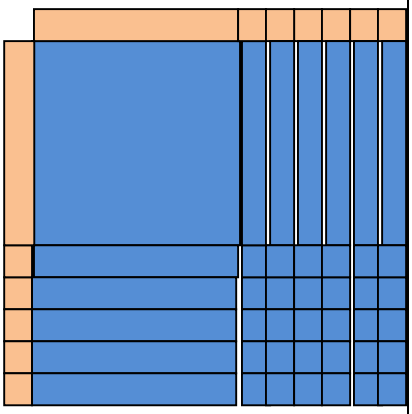
SMART BOARD
Show models of arrays and corresponding algorithms.

Classroom Teachers
Please circulate the room to see that students are not having difficulty representing the problems.

MAKING THE FRAME



FILLNG THE FRAME



Unit 3, Lesson 2 3-4

TV Lesson - continued

Comprehensible Input
TEACHER: Good question and good place to start. First of all, the "algorithm" is the process by which we use numbers to compute. That is, any time we add, subtract, multiply or divide, we have certain steps that we go through to accomplish the computation. Those steps are the algorithm.

Let's take a look at our first problem. First we'll solve it using our base ten blocks. Then we'll solve it using just numbers and the "algorithm," or computation steps.

Problem:
There were 15 monsters at the Monster Mash. Each monster ate 16 monster snack cookies. How many cookies did they eat?

What is the **math movie** you saw in your mind when we read the first problem? *(Pause to discuss – then pirate can answer.)*

Looks like we have multiple sets of the same number of cookies. That tells me I can short-cut repeated addition and multiply.

Using our blocks, we need our two **factors**. What are they? *(pause to gather)*

15 monsters – that would be the groups of
16 cookies each – that's the number in each group.

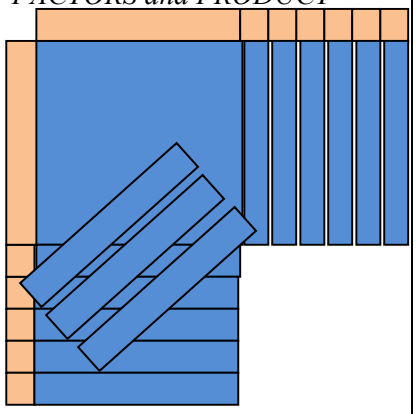
MAKING THE FRAME
What are the fewest number of base ten blocks I can use to make 15? *(quick pause) (One ten and five ones)* Let's make that our "rows" factor.

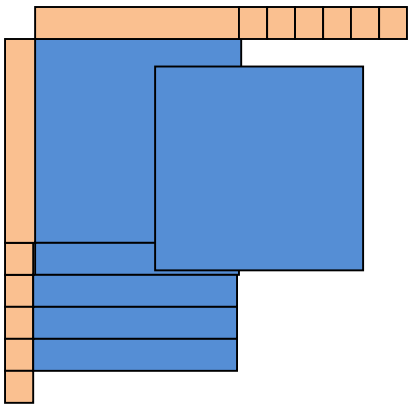
And what are the fewest blocks we can use to make 16? *(pause) (one ten and six ones)* Let's make the columns factor.

FILLNG THE FRAME
What is the largest base ten block you can use to start filling in the frame? *(pause)* This looks like a 10 times 10 space here – we can start with a 100 flat. *(do so)* Can we use any more hundred flats in this array? (*No – demonstrate that another hundred would simply spill outside of the frame boundaries.*)

What's the next block we can use? *(pause) (a ten rod)* Where do they go? *(pause) (six up at the top, and five running down the bottom)*

FACTORS and PRODUCT





Product represented numerically

2 4 0

TV Lesson - continued

FACTORS AND PRODUCT

We have our two factors, 15 and 16. And we have our product which is the filling of the frame.

Let's count up our product.

First of all, are there any exchanges that we can make? *(Pause to discuss.)*

I see a whole big bunch of ones. Let' count them (*count by 5s*). There are 30 ones. What shall we do? (*pause*) Trade them in sets of ten for tens. *(Model trading ten units at a time until you have three tens.)*

We still have THIRTY. We just have them in a different form – three tens instead of 30 ones.

How many ones do we have now? *(none, zero)* Let's start representing our product in numbers. *(See illustration – just write the zero now.)*

What about the tens? Can we regroup any of the tens? *(pause)* Yes, we have 14 tens or 140, so we can trade 10 tens for one hundred *(do so)*.

We still have 140, we just have it in a different form – one hundred and four tens instead of 14 tens.

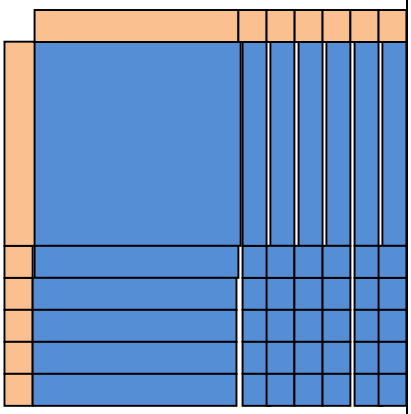
How many tens do we have now? *(pause – 4)* Let's record that in our numerical representation *(write four in the tens place)*.

Do we have any more trades we can make? *(pause)* No, we do not. We have not yet recorded our hundreds. How many hundreds do we have? *(pause) (2)* Let's write two in the hundreds place to represent our two hundreds blocks *(do so)*.

According to our model, our product is 240. What does that 240 represent in our word problem? Read problem #1 again to see what 240 represents *(pause)*. It's the total number of cookies all those monsters ate – whew, that's a bunch!

Now, let's connect what we did with our blocks to the algorithm, or the steps we would take with numbers to multiply 15 x 16.

SMART BOARD
Really handy as a Ppt presentation for this correlation.



Unit 3, Lesson 2 3-4

TV Lesson - continued

First we'll compute using a very old process called "Partial Products."
Let's set up our standard 2-digit multiplication format.

Partial Products

16
x15
30
50
60
100
240

Every time we multiply, we are going to record the product, and we are going to check our base ten model to see how that product is represented in the model. Let's go. Please be sure you are working along with me.

5 x 6 = 30
Notice that I am writing the entire product in my algorithm – partial products, remember. Now, can you see the 30 in our model? Sure, the 30 units.

What does this one represent? *(the one ten in 16*) The one in this place in 16 tells me that I have one ten. So I'm really multiplying 10 by 5, and that equals 50. Can you find the 50 in our model? Yes, these five tens.

Now, what does this one in the 15 represent? *(10)* So when I multiply by this one, I'm really multiplying by 10. 10 x 6 = 60. And where are these six tens in our model? Sure, these vertical tens at the top of the model.

Finally, I have 10 x 10 and that is 100. That's obvious where that is in the model, isn't it?

Let's add up our partial products to see what our total is *(do so aloud)*. Yes! 240, just like we modeled!!!

You can use partial products anytime you want as a strategy to multiply numbers. Just remember the place value of the digits in each number.

PIRATE: But I know a shorter way to multiply. Where did that come from, and how does that relate to the model?

Unit 3, Lesson 2 3-4

TV Lesson - continued

TEACHER: Good question, Capt. Portio! You know, mathematicians are lazy – they want to find the quickest most efficient way to work with numbers. A long time ago some very smart mathematician saw that you could condense the partial product process by regrouping in the algorithm. Let's check that out.

Arthimus Portio's Corner
Lesson 2 –Graphing
Which monster did your class select as the fiercest monster? Why do you think that is so? What makes the choice scarier than others on the graph?

16 x15 30 50 60 100 240	3 16 x15 180 160 240	Because we know how to regroup, trade, exchange, we can combine steps. 5 x 6 = 30. That is 0 ones and three tens. Let me put those tens in the tens place in the algorithm. And five times 10 is 50 add the 30 and we have 80. Our answer for multiplying 5 x 16 is 80. Now we're multiplying by 10. 10 times six is 60. Let me record that. And 10 x 10 = 100; this is the hundreds place. *(Repeat the same process for multiplying by the 10 in 15.)*

(If you have time, work through problem #2 which is division. If you do not have time to work through the entire process, at least set up the base ten model.)

PIRATE: *(Close the lesson and discuss the Pirate's Corner task.)*

Objectives: And now before we go, let's review what we have learned today! *(do so)*

BLM Unit 3, TV and Follow-up Lesson 2 **Monster Math**
(One page per student)

1. There were 15 monsters at the Monster Mash. Each monster ate 16 monster snack cookies. How many cookies did they eat?

2. Master Chef Moonie Monster baked 132 dozen Monster Mash snack cookies. If each of his baking pans baked 12 dozen cookies, how many pans of cookies did he bake?

3. Claris Coppertop, County Clerk of Copperton County, counted 143 copper-colored eyes at the Monster Mash. Each monster had 14 copper-colored eyes. How many monsters were there?

4. Pinky Fuzz was trucking snails to the Monster Mash. His truck carried 14 tons, and he carried 17 full truck loads of snails to the Mash. How many tons of snails did Pinky Fuzz truck to the Monster Mash?

BLM Unidad 3, TV Lección de seguimiento 2 **Matemáticas "Monster"**

(1 página por estudiante)

1. Habían 15 monstruos en el Monster Mash. Cada monstruo se comió 16 galletitas de monstruos. ¿Cuántas galletitas se comieron?

2. El Chef Magistral Moonie Monster horneó 132 docenas de galletitas Monster Mash. Si en cada uno de sus moldes de hornear se horneaban 12 docenas de galletitas, ¿cuántos moldes de galletitas él horneó?

3. Claris Coppertop, Secretario del Condado de Copperton, contó 143 ojos color cobre en el Monster Mash. Cada monstruo tenía 14 ojos color cobre. ¿Cuántos monstruos había allí?

4. Pinky Fuzz transportaba caracoles en su camión al Monster Mash. Su camión llevaba 14 toneladas y llevó 17 cargas completas de caracoles al Mash. ¿Cuántas toneladas de caracoles llevó Pinky Fuzz en su camión al Monster Mash?

BLM Unit 3, TV and Follow-up Lesson 2 **Division Description**
(One page per student)

Work through Problem #2 to show how to divide using base ten blocks and how to relate the model to the algorithm. (NOTE: The two division problems given are purposely simple – there are no regroupings necessary, and no remainders.)

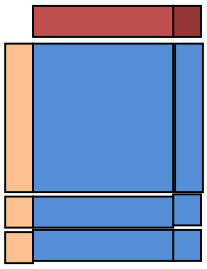
Master Chef Moonie Monster baked 132 dozen Monster Mash snack cookies. If each of his baking pans baked 12 dozen cookies, how many pans of cookies did he bake?

Process Using Base Ten

- Read the problem, looking for the math movie.
- Decide on the factors and product. This time, the product is known.
  Factor 12
  Factor *x*
  Product 132

- Begin with the first factor, then arrange the product inside the incomplete frame so that the ones match the known factor. The missing factor is then filled in to match the product.

1. Known factor



2. The missing factor is then filled in to match the product.

3. Product arranged so that the two units in the product will match the two units in the known factor, 12.

4. Fill in with tens to complete the array.

Process of Partial Products

Just remember you are working in place value. Partial Product division is just like partial product multiplication. Ever y time you divide in the place value, write down the factor

$12\overline{)132}$ $\underline{-120}$ 12	10 $\underline{+\ 1}$ 11	• 132 divided by 12 – I know that 10 x 12 = 120. That's close enough for my first division. • When I subtract 120 from 132, I have a remainder of 12. • 12 divided by 12 is 1. My missing factor is 11. As you work with the traditional algorithm, be sure that you are STILL dividing in place value. So, when you divide the 12 into "13," you are really dividing into 130. Be sure that you MULTIPLY back by 10 so that your traditional algorithm still shows 132 – 120.

BLM Unidad 3, TV y Lección de seguimiento 2 **Descripción de división**
(1 página por estudiante)

Trabajaremos con el Problema #2 para mostrar cómo dividir usando los bloques base 10 y cómo relacionar el modelo con el algoritmo. (NOTA: Los 2 problemas de división proporcionados son sencillos a propósito – no hay que hacer reagrupamientos ni hay residuales.)

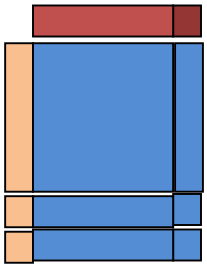
El Chef Magistral Moonie Monster horneó 132 docenas de galletitas Monster Mash. Si en cada uno de sus moldes de hornear cabían 12 docenas de galletitas, ¿cuántos moldes de galletitas horneó?

Procedimiento usando Base 10

- Lee el problema, buscando la película de matemáticas.
- Decide cuáles son los factores y el producto. Esta vez se conoce el producto.
  Factor 12
  Factor *x*
  Producto 132

- Empieza con el primer factor, luego ordena el producto dentro del marco incompleto para que los unos igualen el factor conocido. Luego, se llena el factor que falta para que iguale el producto.

1. Factor conocido



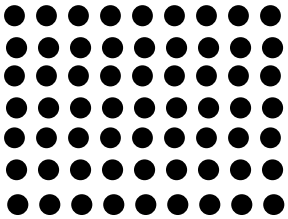
4. El factor que falta entonces se llena para que iguale el producto.

2. El producto se ordena de manera que las dos unidades en el producto igualarán las 2 unidades en el factor conocido, 12.
3. Llena con bloques de 10 completar el conjunto.

3rd Grade Post-Test Teacher Scoring Instructions and Answer Key

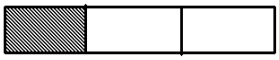
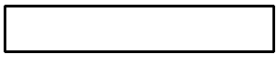
Note: ***"Strategy"*** refers to any method that could lead to the correct answer. Students may use a correct strategy and still get an incorrect answer.

Note: ***Writing labels*** is important to stress during instruction. However, for the purpose of this assessment, students do not lose credit when the label is missing.

Objective/Needs	Problems Points
NY-3.OA.3 – Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. **1a–Award 1 point** for a correct array **1b-Award 1 point** if student writes all four number sentences of the fact family	1a. Draw an *array* to model 6 x 7. You may draw this freehanded, or use the grid provided.  **1a. Array:** Student can draw an array or shade in the grid to represent 6 x 7. This array represents 6 rows by 7 columns. An array with 7 rows by 6 columns can be accepted. 1b.Write the fact family for 6 x 7. **1b. Fact Family:** 6 x 7 = 42 42 ÷ 7 = 6 7 x 6 = 42 42 ÷6 = 7 Number sentences can be in any order as long as all 4 are recorded.
NY-3.OA.4 – Determine the unknown whole number in a multiplication or division equation relating three whole numbers **2-Award 1 point** for the correct answer	**2.** 36 ÷ 6 = 6
NY-3.OA.1 – Interpret products of whole numbers. e.g., Interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. **3-Award 1 point** for the answer	**3.** Which picture below could be used to model 3 x 5? **ANSWER: C** (3 groups of 5) **C** 

Note: ***"Strategy"*** refers to any method that could lead to the correct answer. Students may use a correct strategy and still get an incorrect answer.

Note: ***Writing labels*** is important to stress during instruction. However, for the purpose of this assessment, students do not lose credit when the label is missing.

NY-3.OA.3 – Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. E.g., using drawings and equations with a symbol for the unknown number to represent the problem. **CGI** – Equal Groups *(Result Unknown or "a x b = ?")* **4a–Award 1 point** for the answer **4b–Award 1 point** for ***showing*** a reasonable strategy	**4.** Carlos caught 18 fish and wanted to freeze them in equal shares for 3 meals. If the fish are all about the same size, how many fish should he put in each freezer container? Show your strategy. **ANSWER: 6 fish**. **Strategy:** Students could draw a picture where 18 fish has been divided among 3 meals; they could skip count; they could use repeated subtraction; they could draw tally marks, they could use a division sentence. (3 x ___ = 18 or 18 ÷ 3 = ___
NY-3.OA.3 – Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. **CGI** – Change Unknown or ("a x ? = p" or "p/a=?") **5a-Award 1 point for the answer** **5b-Award 1 point** for ***showing*** a reasonable strategy	**5.** Juanita was packing the 24 dolls in her doll collection. She wanted to pack only 4 dolls per box. How many boxes will she need? Show your strategy. **ANSWER: 6 boxes.** **Strategy:** Students could draw a picture where 24 dolls (dots) have been divided by groups of 4 to see how many boxes she needed; they could skip count; they could use repeated subtraction; they could draw tally marks, they could use a division sentence. (24 ÷ 4 = ____ or ____ x 4 = 24)
NY-3.NF.3b – Recognize and generate equivalent fractions. e.g., 1/2 = 2/4; 4/6 = 2/3 Explain why the fractions are equivalent.	**6.**  The model shows $\frac{1}{3}$.  6a.Use the second rectangle to model a different fraction equivalent to $\frac{1}{3}$. 6b.Write the name of the other fraction equivalent to $\frac{1}{3}$. _____

6–Award 1 point if the student does **both parts correctly:** shows an equivalent fraction in the rectangle ***and*** writes the fraction name.

(#6 continued)

Answers*:* 6a. Students should use the blank rectangle to model (draw and shade) the equivalent fraction, as well as write the fraction.

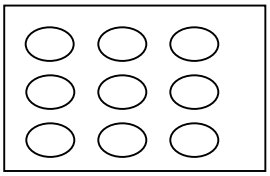
6b. The written fraction could be in words, although most students will use the numeric form. For example, a possible answer would be 2/6 which could also be written acceptably as two sixths.

NY-3.OA.3 – Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. E.g., using drawings and equations with a symbol for the unknown number to represent the problem.

7–Award 1 point if the student has ***both*** the correct answer ***and*** shows a reasonable strategy

7.

Karli is making batches of cookies on a small cookie sheet. If she bakes 5 pans just like the picture, how many cookies will she bake? Show your strategy**.**



ANSWER: 45 cookies.

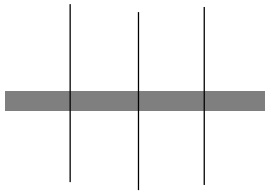
Strategy: Students could draw additional pans, use repeated addition; skip count, tally; use multiplication.
(5 x 9 = ___; 9 + 9 + 9 + 9 + 9 =____)

NY-3.NF.3b – Recognize and generate equivalent fractions. e.g., 1/2 = 2/4; 4/6 = 2/3 Explain why the fractions are equivalent. **NY-3.NF.3d** – Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons rely on the two fractions referring to the same whole. Record the results of comparisons with the symbols >, =, <, and justify the conclusions, e.g., by using a visual fraction model.

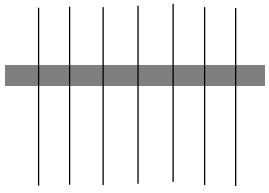
8–Award 1 point if the student ***divides each*** rectangle appropriately, ***circles*** the larger fraction, ***and*** writes the fractions in the correct blank space.

8a. Divide the cakes into the fractional parts.

$\frac{1}{4}$ of this string



$\frac{1}{8}$ of this string



8a.Divide: Students do not have rulers to be exact, but need to represent understanding.

8b.Circle: Students can circle the fraction or the portion on the rectangle.

8c.Compare: 1/4 > 1/8

8b.Compare the fractions. $\frac{1}{4}$ or $\frac{1}{8}$?

Which fractional part is larger

Circle the fractional portion on the picture that is larger.

8c. Using the fractions above write the comparison statement.

$\frac{1}{4}$ _____ > _____ $\frac{1}{8}$

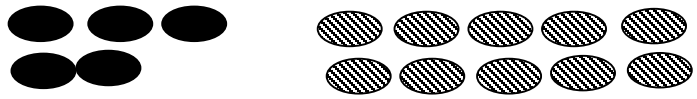
Post-Test

Name_____

☐1a 1 Point Array ☐1b 1 Point Fact Family	**1a. Draw an *array* to model 6×7. You may draw this freehanded, or use the grid provided.** **1b. Write the fact family for 6×7.**
☐2 1 Point	2. ☐ **÷ 6 = 6**

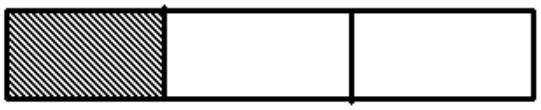
Post-Test

Name_____

☐3 1 Point	**3. Which picture below could be used to model 3×5? Circle your answer.** **A**  **B**  **C**  **D** 
☐4a 1 Point answer ☐4b 1 Point strategy	**4. Carlos caught 18 fish and wanted to freeze them in equal shares for 3 meals. If the fish are all about the same size, how many fish should he put in each freezer container?** **Show your work.**

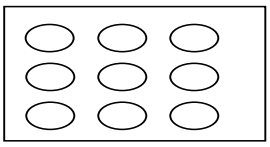
Post-Test

Name_____

☐5a 1 Point answer ☐5b 1 Point strategy	**5. Juanita was packing the 24 dolls in her doll collection. She wanted to pack only 4 dolls per box. How many boxes will she need?** **Show your work.**
☐**6** **1 punto**	**6.**  **This model shows $\frac{1}{3}$.**  **6a. Use the second rectangle to model a different fraction equivalent to $\frac{1}{3}$.** **6b. Write the name of the other fraction equivalent to $\frac{1}{3}$.** _____

Post-Test

Name_____

☐7 1 punto	**7. Karli is making batches of cookies on a small cookie sheet. If she bakes 5 pans just like the picture, how many cookies will she bake?** **Show your work.** 
☐8 1 Point	**8a. Divide each string into fractional portions.** $\frac{1}{4}$ **of this string**  $\frac{1}{8}$ **of this string**  **8b.Compare the fractions.** **Which fractional part is larger** $\frac{1}{4}$ or $\frac{1}{8}$? **Circle the fractional portion on the picture that is larger.** **8c. Using the fractions above write the comparison statement.** _____ > _____
_____**/11** **(Total points)**	

Post-Test SPANISH

Name_____

☐1a
1 punto
conjunto

☐1b
1 punto
familia
de
hecho

1a. Dibuja una matriz (array) que muestre 6 x 7. Puedes hacer un dibujo libre, o puedes utilizar la cuadrícula..

1b. Escribe la familia de hecho (fact family) para 6 x 7.

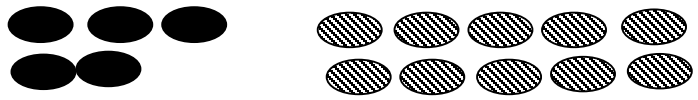
☐2a
1
punto

2.

$\square \div 6 = 6$

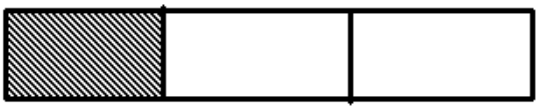
Post-Test SPANISH

Name_____

☐3 1 punto	**3. ¿Cuál de los dibujos que ves a continuación puede utilizarse para modelar 3 x 5?** **Señala con un círculo tu respuesta.** **A**  **B**  **C**  **D** 
☐4a 1 punto respuestas ☐4b 1 punto estrategia	**4. Carlos pescó 18 peces y quería congelarlos en porciones iguales para 3 comidas. ¿Cuántos peces deberá poner en cada contenedor del congelador si los peces son todos más o menos del mismo tamaño?** **Muestra tu trabajo.**

Post-Test SPANISH

Name_____

☐5a 1 punto respuestas ☐5b 1 punto estrategia	**5. Juanita estaba guardando 24 muñecas de su colección. Quería guardar 4 muñecas en cada caja. ¿Cuántas cajas necesitará?** **Muestra tu trabajo.**
☐6 1 point	**6.**  **El modelo muestra $\frac{1}{3}$.**  **6a. Usa el segundo rectángulo para modelar otra fracción equivalente a $\frac{1}{3}$.** **6b. Escribe el nombre de la otra fracción equivalente a $\frac{1}{3}$.** _____

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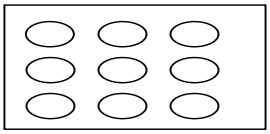
Name_____

☐7 1 punto	**7. Karli está preparando grupos de galletas en una bandeja. ¿Cuántas galletas hará en total si prepara 5 bandejas como la del dibujo?** **Muestra tu trabajo.** 
☐**8** 1 punto	**8a. Divide la cuerda en las partes fraccionarias.** $\frac{1}{4}$ **de esta cuerda**   $\frac{1}{8}$ **de esta cuerda** **8b. Compara las fracciones.** **¿ Qué parte fraccionaria es más grande,** $\frac{1}{4}$ o $\frac{1}{8}$ **?** **Marca la parte fraccionaria en el dibujo que es más grande.** **8c. Usando las fracciones arriba escribe la oración de comparación.** _____ > _____

_____/ 11

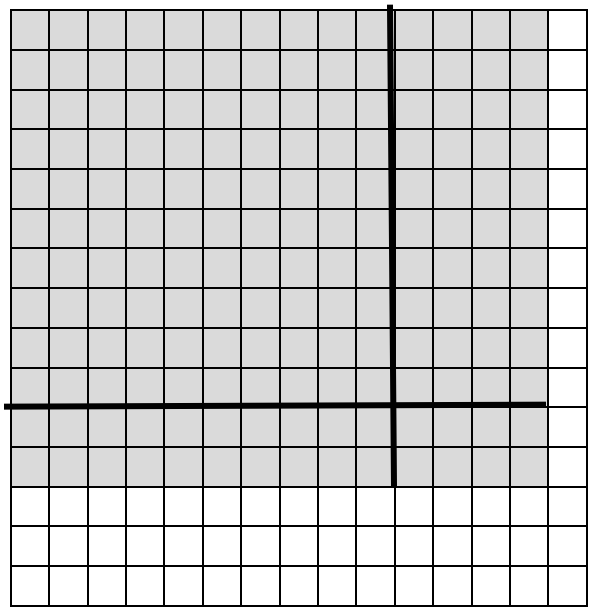
Total points

Pre-/Post- Supplies

	Base Ten manipulatives suggested for students to have available to use. • Hundreds, tens, ones

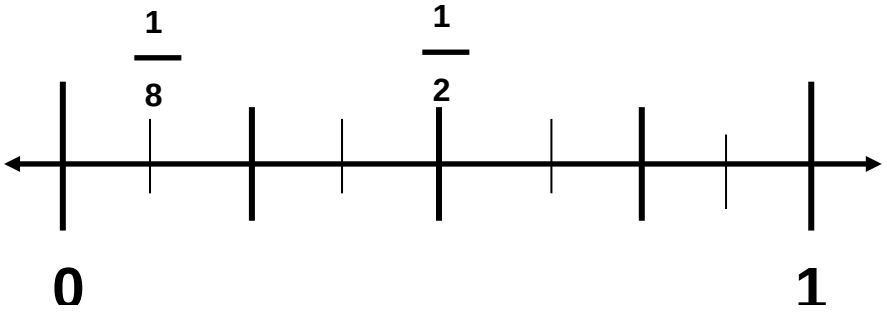
4th Grade Post-test Teacher Scoring Instructions and Answer Key

Note: *"Strategy"* refers to any method that could lead to the correct answer. Students may use a correct strategy and still get an incorrect answer.

	Problems-Solutions
NY-4. NF.6 **1a-Award 1 point** for the correct answer **1b-Award 1 point** for the correct answer	**1.** Write the following fractions as decimals. (a) $\frac{45}{100}$ = _____ (b) $\frac{3}{10}$ = _____ ***Answer:*** **(a) 0.45** **(b) = 0.3 (but 0.30 isn't wrong)**
NY-4.NBT.4 **NY-4.NBT.5** **2a-Award 1 point** for array **2b-Award 1 point** for correct answer **2c-Award 1 point** for showing a reasonable method	**2.** Represent 14 x 12 using an array. (a) Shade in the array.  ***Correct Responses:*** **(a) The array can be drawn to show 14 by 12 or 12 by 14.** **Note:** Students do not have to show the heavier lines for 10 x 10. They just help a student find and count the 100-block and the rows of ten. **(b) *Answer:* 168** **(c) Method Point: Give point for any reasonable method to find the product.**

Note: *"Strategy"* refers to any method that could lead to the correct answer. Students may use a correct strategy and still get an incorrect answer.

Note: *Writing labels* is important to stress during instruction. However, for the purpose of this assessment, students do not lose credit when the label is missing.

NY-4. NF.7 **3-Award 1 point** for correct answer	**3.** Carolyn needs to walk 1 mile this week in order to meet her goal. Circle the longest trail. A. Mountain Pass Trail……. 0.65 mile B. Red Creek Trail…….. 0.83 mile ***Answer:*** **B.** The Red Creek Trail is longer. 0.83 mile is greater than 0.65 mile.
NY-4. NF.2 **4-Award 1 point** for correct answer	**4.** Marci has two recipes for biscuits. One recipe needs $\frac{1}{2}$ cup of buttermilk and another that needs $\frac{2}{3}$ cup of buttermilk. Using the fractions above, write the comparison sentence: _____ > _____ ***Answer:*** **2/3 > 1/2** Three fourths is greater than two fourths.
NY-4.MD.4 **5-Award 1 point** for correctly placing ***both*** fractions	**5. Write these fractions on the number line.** 

Note: *"Strategy"* refers to any method that could lead to the correct answer. Students may use a correct strategy and still get an incorrect answer.

Note: *Writing labels* is important to stress during instruction. However, for the purpose of this assessment, students do not lose credit when the label is missing.

<table>
<tr><td rowspan="3">NY-4.NBT.5

CGI-Equal Groups (Result Unknown or "a x b = ?")

6a-Award 1 point for the correct answer

6b-Award 1 point for showing a reasonable strategy</td><td>6. The Safari guide watched the birds. He saw 18 flocks of birds. Each flock had 49 birds. How many birds did he see?
Show your work.</td></tr>
<tr><td>Answer: 882 birds

Strategy Point: Students may choose to use any reasonable strategy such as drawing a diagram, array, breaking apart, using a traditional algorithm (using numbers and a process), etc.
(18 x 49)</td></tr>
<tr><td></td></tr>
<tr><td>NY-4.NF.6

7-Award 1 point for having both answers correct</td><td>7.
 
(a) Write the fracton that would best represents the shaded portion of this bar. _____

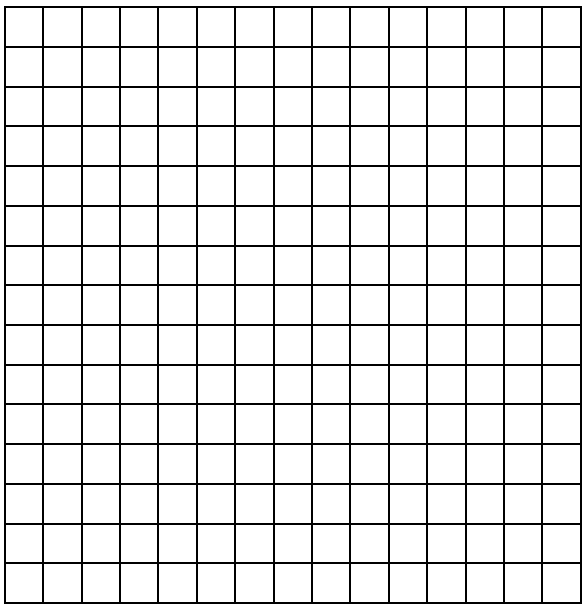
(b) Write the fraction as a decimal. _____

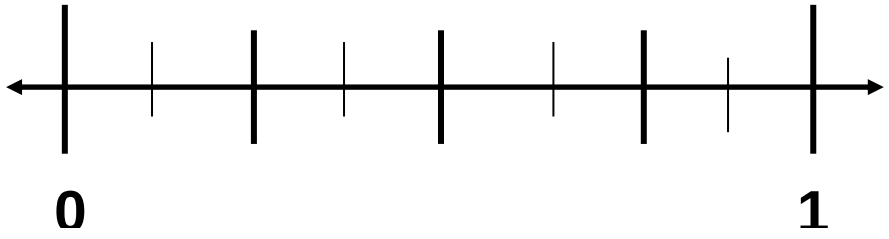
Answers:
(a) 7/10
(b) 0.7 (but 0.70 is not wrong)</td></tr>
</table>

_____/11
Total Points

Post-Test

Name _____

	Problems
☐ 1a 1 point ☐ 1b 1 point	**1. Write the following fractions as decimals.** **(a)** $\frac{45}{100}$ **=** _____ **(b)** $\frac{3}{10}$ **=** _____
☐ 2a 1 point for array ☐ 2b 1 point for answer ☐ 2c 1 point for other method	**2. Represent 14 x 12 using an array.** **(a) Shade in the array.**  **(b) 14 x 12 = _____** **(c) Show one other method to find the product of 14 x 12.**

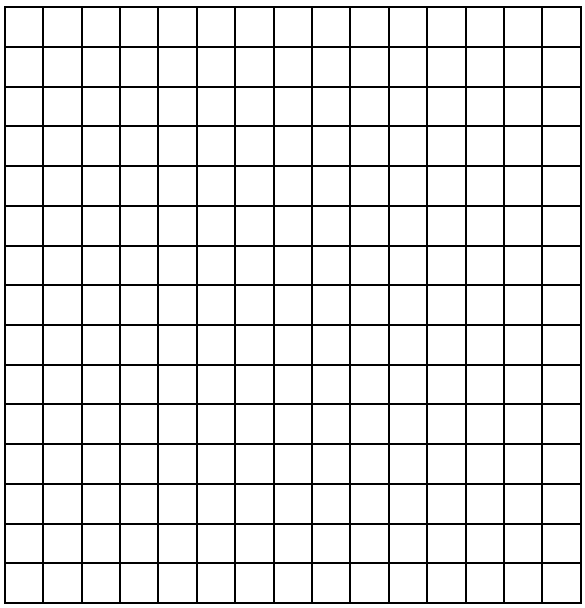
☐ 3 1 point	**3. Carolyn needs to walk another mile this week in order to meet her goal.** **Circle the longest trail.** **A. Mountain Pass Trail……. 0.65 mile** **B. Red Creek Trail……. 0.83 mile**
☐ 4 1 point	**4. Marci has two recipes for biscuits. One recipe needs $\frac{1}{2}$ cup of buttermilk and another that needs $\frac{2}{3}$ cup of buttermilk.** **Using the fractions above, write the comparison sentence:** **_____ > _____**
☐ 5 1 point	**5. Write these fractions on the number line. $\frac{1}{2}$ $\frac{1}{8}$** 

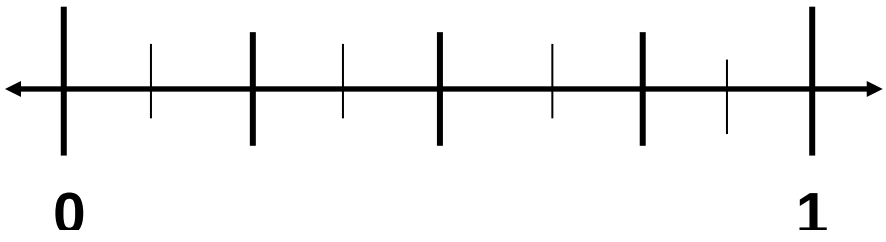
☐ 6 1 point	**6. The Safari guide watched the birds. He saw 18 flocks of birds. Each flock had 49 birds. How many birds did he see?** **Show your work.**
☐ 7 1 point	**7.**  **(a) Write the fraction that best represents the shaded portion of this bar. _____** **(b) Write the fraction as a decimal. _____**

_____/11
Total Points

Post-Test - Spanish

Name _____

	Problemas
☐ 1a 1 punto ☐ 1b 1 punto	**1. Escribe las siguientes fracciones como decimales.** **(a)** $\frac{45}{100}$ **=** _____ **(b)** $\frac{3}{10}$ **=** _____
☐ 2a 1 punto para la matriz ☐ 2b 1 punto por la respuesta ☐ 2c 1 punto por el otro método	**2. Representa 14 x 12 usando una matriz.** **(a) Sombrea en la matriz.**  **(b) 14 x 12 =** _____ **(c) Muestra un método más para encontrar el producto de 14 x 12.**

☐ 3 1 punto	**3. Carolyn necesita caminar otra milla esta semana para completar su objetivo.** **Circula el camino más largo:** **A. El Camino de Mountain Pass ……. 0.65 milla** **B. El Camino de Red Creek ……. 0.83 milla**
☐ 4 1 punto	**4. Marci tiene dos recetas para preparar galletas. Una receta necesita $\frac{1}{2}$ taza de leche dulce y la otra necesita $\frac{2}{3}$ taza de leche dulce.** **Usando las fracciones anteriores, escribe la oración de comparación:** **_____ > _____**
☐ 5 1 punto	**5. Escribe estas fracciones en la línea numérica.** $\frac{1}{2}$ $\frac{1}{8}$ 

☐ 7a 1 punto respuesta ☐ 7a 1 punto estrategia	**7. El guía del safari observó a los pájaros. Vio 18 bandadas de pájaros. Cada de las bandadas tenía 49 pájaros. ¿Cuántos pájaros vio?** **Muestra tu trabajo.**
☐ 8 1 punto	**8.**  **(a) Escribe la fracción que mejor represente la porción sombreada de esta barra. _____** **(b) Escribe la fracción como un decimal. _____**

_____/11
Total Points