Summer Math 2019

Grades 5-6 

MASTER 1 – Units 1-5 and Extra Math Lessons

These page numbers below are only the computer numbering, when 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: 5-6 Educator Guide for Units 1-5

Suggested Paper Color Code: Yellow Math Matters Code for Grade Band: Owl Icon

Summer Math Objectives: To review and reinforce the following Grade 5 skills.

Major Fluency for Fifth Grade: 5.NBT.5- Fluently multiply multi-digit whole numbers using the standard algorithm.

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

NY-5.NF.1 – Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. e.g.,

- 1/3 + 2/9 = 3/9 + 2/9 = 5/9
- 2/3 + 5/4 = 8/12 + 15/12 = 23/12

NYS Power Standard: NY-5.NBT.7 – Using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between operations:

- add and subtract decimals to hundredths;
- multiply and divide decimals to hundredths.

Relate the strategy to a written method and explain the reasoning used.

Note: Students should be taught to use concrete models and drawings; as well as strategies based on place value, properties of operations, *and* the relationship between operations. When solving any problem, students can choose to use a concrete model *or* a drawing. Their strategy must be based on place value, properties of operations, or the relationship between operations.

Note: Division problems are limited to those that allow for the use of concrete models or drawings, strategies based on properties of operations, and/or the relationship between operations (e.g., 0.25 ÷ 0.05). Problems should not be so complex as to require the use of an algorithm (e.g., 0.37 ÷ 0.05).

Summer Math Objectives: To review and reinforce the following Grade 6 skills.

Major Fluency for Sixth Grade: **NY-6.NS.3** – Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Major Work for Sixth Grade: Ratios and proportional relationships, early work with expressions and equations.

NYS Power Standard: NY-**6.RP.3d** – Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

Note: Conversion of units occur within a given measurement system, not across different measurement systems.

NYS Power Standard: NY-6.RP.3c – Find a percent of a quantity as a rate per 100. Solve problems that involve finding the

whole given a part and the percent, and finding a part of a whole given the percent. e.g., 30% of a quantity means 30100 times the quantity.

Procedural Fluency: NY-6.NS.3 – Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

NY-6.RP.1 – Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. e.g., "The ratio of wings to beaks in the birdhouse at the zoo was 2:1 because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."

NYS Power Standard: NY-**6.RP.3b** – Solve unit rate problems. e.g., If it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed? What is the unit rate?
Note: Problems may include unit pricing and constant speed.

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 and Answer Key *(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 they 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.

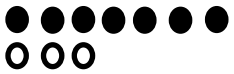
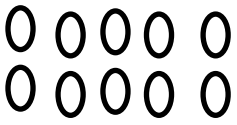
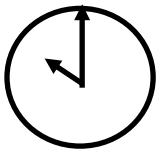
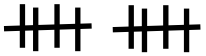
Process:

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 + 10	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. While New York State's Next Generations Learning Standards have similar word problem charts for grades K-4, this does not continue into Grades 5-6.

Using the CGI Charts from Math Matters with students in Grades 5-6 gives the students practice with reasoning to find the solutions, as well as practicing the math skills for multiplication and division with decimals and fractions, as well as working with various rate problems.

Using the CGI process supports students in thinking through the question and strategies for solving the word problems.

Key Points:

- 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.
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:** Some problems have two to three sets of numbers at the bottom 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? *[Anita saves $9.50 every week.]* How can we write? *[Each week- $9.50]*
    c. What do we learn next? *[Anita saves money for 5 weeks]* How can we write? *[weeks = 5]*
    d. What question do we have to answer? *[How many money does she have in the jar?]* How can we write this? *[___ in jar at the end]*
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? *[Anita saved $47.50 in the jar.]*

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 Fourth Grade in June, but might be considered a (rising) Fifth Grader in the summer, should take the Summer Assessments for Grade 4. The questions are based on end-of-year mastery to maintain core math skills over the summer.

Note: Grades 5 and 6 receive the instruction together, but the students are assessed with different a pre-/post-tests. Each has different supplies to support the student.

- **Grade 5** uses a single OWL icon to code the papers students can see.
- **Grade 6** uses two OWL ICONS to code the papers students can see.
- ***No extra supplies are suggested for Grades 5 or 6 to have during the assessments.***

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.*

- The Math Matters assessments correlate well to NYS's Next Generation Standards. There are only cosmetic changes for consistency and readability.
- The Educator Scoring Instructions were modified to provide more examples and explanations for the strategies.

Informal Assessments

Educators can observe when 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 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?*
- *Is the wording of the problem causing misunderstanding, rather than the math?*
- *Does the student need to have both the English and Spanish packets to work with?*

You can follow up the next lesson:

- 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 Grades 5-6, to teach/ reteach the Summer Math skill for individual students.

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, most lessons refer to a "Pirate's Corner" that was an on-line activity when the Math Matters Consortium was funded. You will need to preview so you can adapt the script to your students and situation.

NY-5NF.1. - Find Equivalent Fractions to solve Addition and Subtraction of Fractions with Unlike Denominators

- This has two lessons. It starts with the Transition to Math (TM), followed by the related "TV" lesson
- Lesson references the Aesop Fable: "The Crow and the Pitcher"
- "BLM" in Math Matters refers to "Black Line Master" (i.e. worksheet)
- Supplies for Students
    - two pieces of construction paper cut 1" by 9," one red and one yellow

NY-6.RP.3c- Introduction to Percents and relationship to Hundredths as fractions and decimals

- Lesson references working with hundredths in an earlier lesson
- Supplies for Students
    - Yellow or orange crayon

NY-6.RP.1 – Introduction to Ratios and Proportional Relationships

- The lesson refers to an earlier lesson about mixing primary colors of paint

- Student Supplies
    - Color counters to represent the portions
        - 6 each: Red, Blue, Yellow

NY-6.RP.1 – Solve Ratio Problems with Cross Multiplication

- The lesson refers to the detective in the book, The Lemon Tree Caper: A Mickey Rangel Mystery/La intriga del limonero: Colección Mickey Rangel, detective privado.
- No Students Supplies suggested

NY-6.RP.1 – Using Percents (portion of the whole) to Solve Problems

- The lesson references a City Mouse/Country Mouse story.
- Supplies for Students
    - Basic Calculator

NY-6.RP.3d - Using Ratios to Convert Measurements

- The lesson refers to a poem about the sea and uses the Bermuda Rig sailboat
- Image of the Bermuda Rig style of sailboat add to the packet to use with students
- No additional Supplies needed for Students

Summer Math

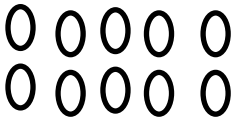
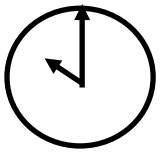
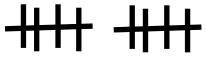
Educator Packet

Unit 1

Warm up: Target Number

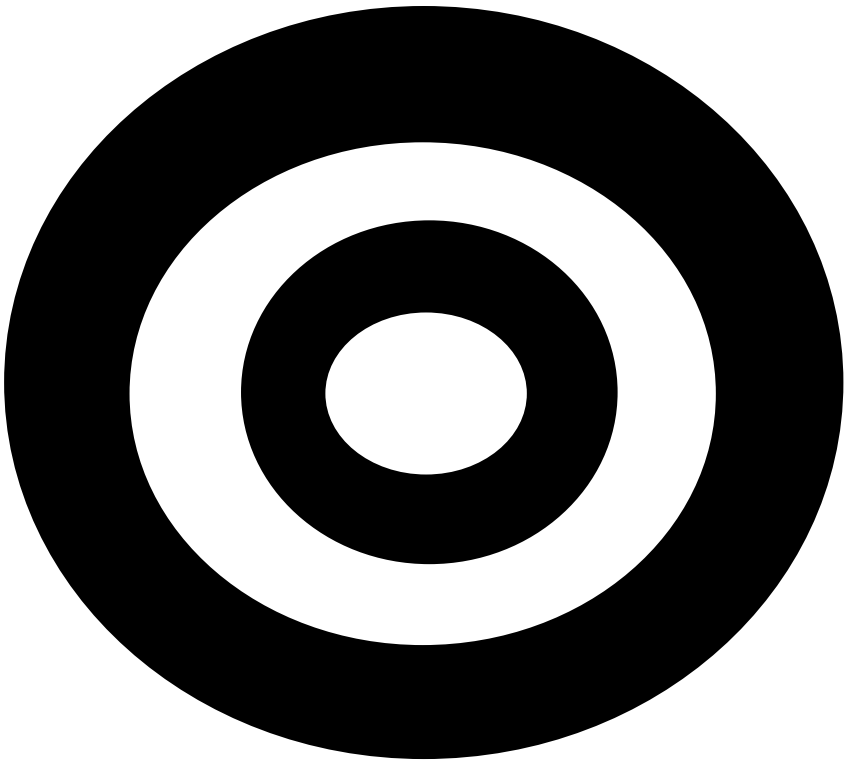
- The task is to represent the target number in different ways in one minute. Do a couple samples with students before starting the timer.
    a. Start all groups with the numbers 12 and 15.
        i. All target numbers are fair to use with students in grades 1 through 8.
        ii. Use numbers 20 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

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***
Grade 5	Multi digit multiplication	***Procedural Fluency***
Grade 6	Multi digit division; multi digit decimal operations	***Procedural Fluency***
Grade 7	Solve two step equations in the form of px + q = r and p(x +q) = r	***Procedural Fluency***
Grade 8	Solve simple 2 x 2 systems of equations by inspection/substitution	***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.

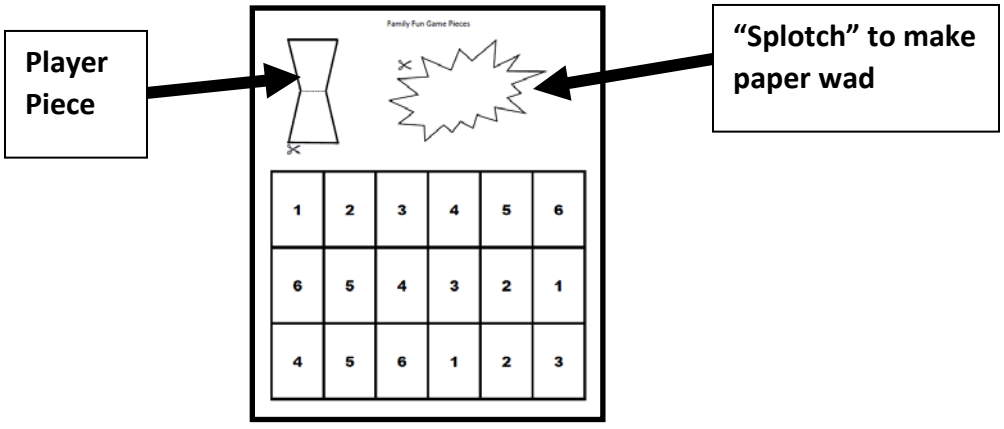
Process:

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:

While the New York State's Next Generations Learning Standards for Grade 5 and Grade 6 do not have a chart of sample word problems, the CGI Chart for Grades 5 and 6 give the students practice multiplying with fractions and decimals. Additionally, the CGI process supports students in reading and solving word problems.

Process:

1. ***Pick one word problem.*** Spend time on the process instead of a quick answer.
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 *Money Sense with Kids*

	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	Anita put __ away in her Short Term money jar every week for __ weeks. How much did she have in the jar then? ($9.50, 5) ($11.25, 6)	Anita had ___. She wanted to give several charities ___ each. How many charities could she donate to? ($45.00, $15.00) ($70, $17.50)	Anita had ___ dollars she wanted to divide equally among her ___ money jars. How much should she put in each jar? ($363, 3) ($366, 6)
Rate	Margo worked in a bakery. She could knead a loaf of bread every __ minutes. At that rate, how long would it take her to knead __ loaves of bread? (10, 5) (7, 8)	Margo worked in a bakery. She could knead __ loaves of bread in one hour. At that rate, how long did it take them to knead __ loaf(ves) of bread? (7, 1) (7, 2) (9, 3)	Margo worked in a bakery. She could knead __ loaves of bread in 40 minutes. At that rate, how many loaves could she knead in __ minutes? (8, 5) (5, 20) (4, 30)
Price	Eloy bought 7 pounds of white fish for $2.50 a pound. How much did he pay for the fish?	Eloy paid $21.77 for fish that cost $7 a pound. How many pounds of fish did he buy?	Eloy paid a total of $45 for 15 pounds of shrimp. How much did he pay a pound for the shrimp?
Fractions	Sammy and his 3 friends had each eaten personal sized pizza for lunch. Each had one-sixth of his pizza leftover. If they put their leftovers together, how much pizza would they have?	Sammy wanted to make pizza dough. The recipe called for $\frac{1}{2}$ cup flour per pizza. If Sammy had 5 cups of flour, how many pizzas could he make?	Sammy's recipe for pizza called for 3/4 cup sausage per pizza. If Sammy could make 8 pizzas, how many cups of sausage did he have?

Unit 1 CGI Problems for *Money Sense with Kids*

	Multiplicación	División de medidas	División partitiva
Agrupamiento/ División	Anita guardó ____ en su alcancía a corto plazo cada semana durante ____ semanas. ¿Cuánto dinero tenía en la alcancía entonces? ($9.50, 5) ($11.25, 6)	Anita tenía _____. Anita quería hacer donativos a varias organizaciones benéficas a razón de $15 cada una. ¿A cuántas organizaciones benéficas pudo donar? ($45.00, $15.00) ($70, $17.50)	Anita tenía ___ dólares que quería dividir igualmente entre _____ alcancías. ¿Cuánto dinero puede poner en cada alcancía? ($363, 3) ($366, 6)
Cociente	Margo trabajaba en una repostería. Podía amasar una barra de pan cada _____ minutos. A tal razón, ¿cuánto tiempo le tomaría amasar ____barras de pan? (10, 5) (7, 8)	Margo trabajaba en una repostería. Podía amasar ____ barras de pan en una hora. A tal razón, ¿cuánto tiempo le tomaría amasar _____barra(s) de pan? (7, 1) (7, 2) (9, 3)	Margo trabajaba en una repostería. Podía amasar _____barras de pan cada 40 minutos.A tal razón, ¿cuántas barras de pan podía amasar en _____ minutos? (8, 5) (5, 20) (4, 30)
Precio	Eloy compró 7 libras de pescado blanco a $2.50 la libra. ¿Cuánto pagó por el pescado?	Eloy pagó $21.77 por pescado que cuesta a $7 la libra. ¿Cuántas libras de pescado compró?	Eloy pagó un total de $45 por 15 libras de camarones. ¿Cuánto pagó por libra de camarones?
Fracciones	Sammy y sus 3 amigos habían comido pizzas individuales para el almuerzo.A cada uno de ellos le sobró una sexta parte de su pizza. Si juntaran sus sobras, ¿qué cantidad de pizza tendrían?	Sammy quería hacer masa de pizza. La receta llevaba ½ taza de harina por pizza. Si Sammy tenía 5 tazas de harina, ¿cuántas pizzas pudo hacer?	La receta de pizza que Sammy usó llevaba ¾ de taza de chorizo por pizza. Si Sammy pudo hacer 8 pizzas, ¿cuántas tazas de chorizo usó?

Materials
- 5 large string cheese
- 4 paper dessert plates
- 4 paper towels
- 4 plastic knives
- 4 pieces wax paper
- 4 pairs of scissors

All items listed above per partner pair
- **BLM** Sting Cheese-Snack Fractions
- **BLM** Sting Cheese-Snack Fractions Teacher Guide

Math Vocabulary
decimal
decimal point
tenths
hundredths
thousandths
compare
order
equivalent
percent

Literature Vocabulary
short-term
long-term
purchases/expenses
income
counterfeit
symbolize
contribution

Unit 1, Lesson 3 Grades 5-6

Snack Fractions

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

Math Objectives
- Represent and solve addition and subtraction of fractions with like and unlike denominators referring to the same whole using objects and pictorial models, including area models.
- Add and subtract positive rational numbers fluently.
- Represent and solve multiplication of a whole number and a fraction that refers to the same whole using objects and pictorial models, including area models.

Language Objectives
- Discuss how fractions, decimals, ratios, and percents can be used to solve real-world problems.

Snack Fractions
Students should have the skills to answer these in small groups. Have the students work through the BLM before sharing the actual snack.

Tell students that today you will share among four students. Distribute the five pieces of string cheese and other supplies to the groups of four and let them decide how to share the string cheese and how much of the set each person received.

When everyone is finished, distribute the **BLM** String Cheese Fractions. Students work in their groups of four to solve the problem. Use class time to discuss the strategies and solutions once all have finished.

Snack Fraction Journal Writing: BLM String Cheese Fractions
During the Snack Fractions activities for this unit you or your classmates may have noticed a relationship between the number of people the snack is being shared with and how many times the snack is "cut" or divided. Example: 3 donuts are shared between 4 people.

Snack Fraction Journal Writing: BLM String Cheese-Snack Fractions
Explain the relationship between the number of people eating the snack and how many times the snack was divided.

Unit 1 Lesson 3 – Snack Fractions
teacher copy

String Cheese – Snack Fractions Teacher Guide

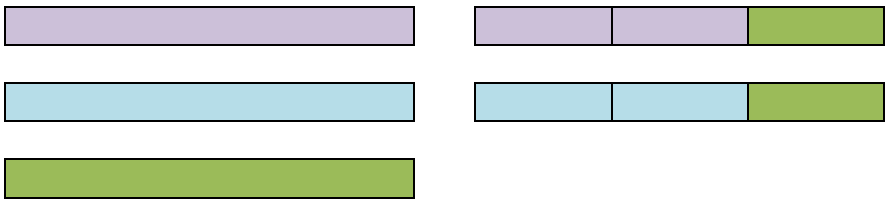
Problem:
Enrique had five pieces of string cheese to share among himself and three of his brothers.

Questions:

1. What fractional portion of the snack did each person receive? $1\frac{1}{4}$

2. How do you write one portion as a decimal? Percent? 1.25 and 125%

3. What if one person wasn't hungry for the string cheese. What fractional portion of the snack would each person receive then? Draw a picture. 1 and $\frac{2}{3}$ The fraction is **NOT** 1 and $\frac{2}{6}$.
   The whole is divided into 3 pieces, therefore those pieces are thirds. Six-thirds are shown in the picture. Six-thirds is equivalent to 2 wholes (2 cheese sticks).



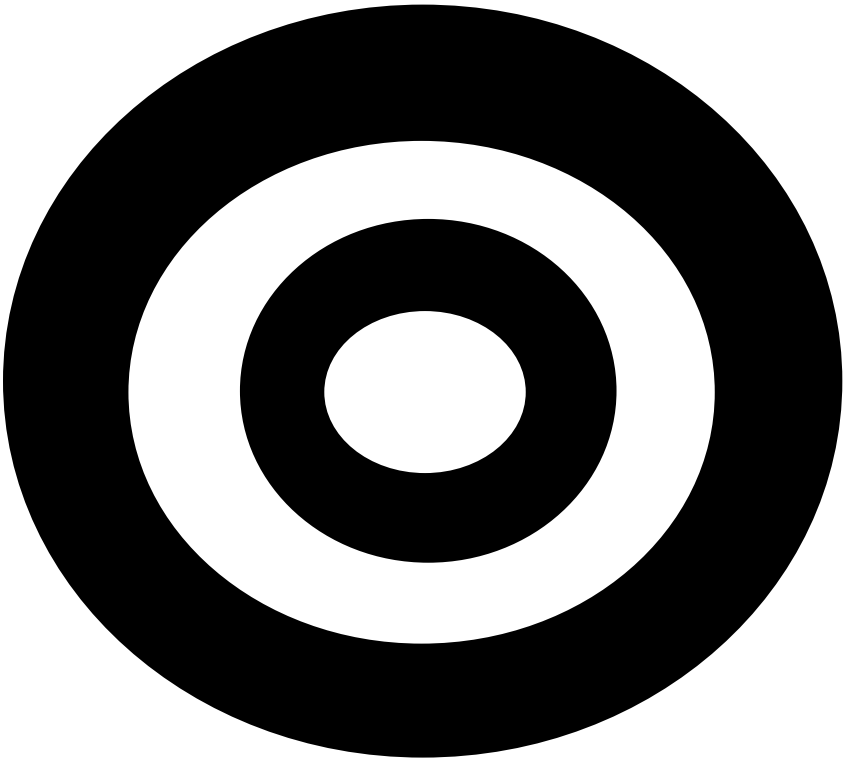
4. How do you write that as a decimal? Percent? 1.66 or 1.67 and 166% or 167%. Although one-third is a repeating decimal, it is a benchmark that all students should become familiar with.

Summer Math

Student Packet/Paquete de alumno

Unit 1

English/Español



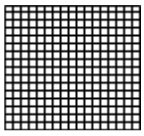
Target Number

Unit 1 Lesson 3 – FAMILY FUN
One per student for home
One per partner pair in class

*Print on **yellow** paper.*

Family Fun – Problem Cards (1 of 3)

A.



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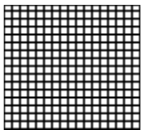

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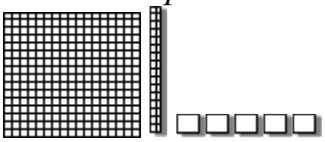
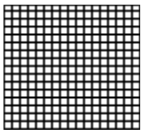


B.



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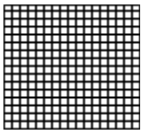

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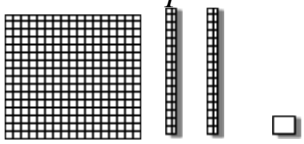

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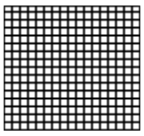

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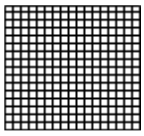

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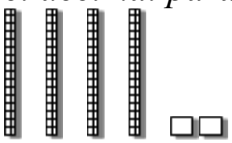
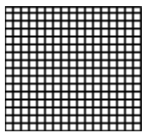


D.



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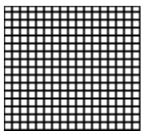
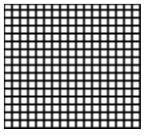


Cuando representa uno, escribe el decimal para:

E.



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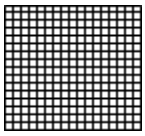
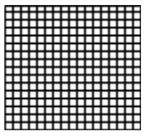


Cuando representa uno, escribe el decimal para:

F.



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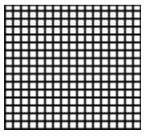
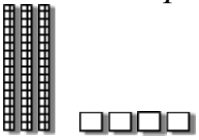


Cuando representa uno, escribe el decimal para:

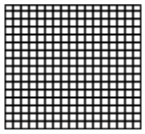


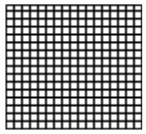
Unit 1 Lesson 3 – FAMILY FUN
One per student for home
One per partner pair in class

*Print on **yellow** paper.*

Family Fun – Problem Cards (3 of 3)

G.

When  represents one, write the decimal for:



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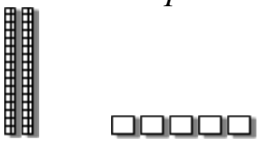
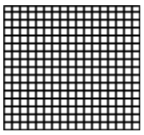
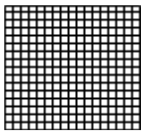


H.

When  represents one, write the decimal for:



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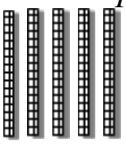
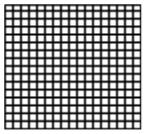
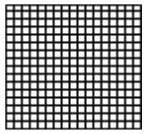


I.

When  represents one, write the decimal for:



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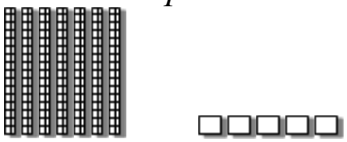


J.

Marty ate $\frac{1}{4}$ of the pizza. Carrie ate $\frac{2}{4}$ of the pizza. They left the rest for their brother. What fractional part of the pizza did they leave for their brother?

Marty se comió $\frac{1}{4}$ parte de la pizza. Carrie se comió $\frac{2}{4}$ partes de la pizza. Dejaron el resto para su hermano. ¿Qué fracción de la pizza dejaron para su hermano?

K.

Abas took $\frac{5}{8}$ of his sport cards to school. What fractional part of the cards did he leave at home?

Abas llevó $\frac{5}{8}$ de sus cartas deportivas a la escuela. ¿Qué fracción de las cartas dejó en su casa?

L.

Alex walked $\frac{2}{5}$ of the way to school. She rode a city bus the rest of the way. How far did she ride on the city bus?

Alex caminó $\frac{2}{5}$ partes del camino a la escuela. Viajó en autobús el resto del camino. ¿Cuán lejos viajó en el autobús?

Unit 1 Lesson 3 – FAMILY FUN
One per student for home
One per partner pair in class

*Print on **yellow** paper.*

Family Fun – Problem Cards (3 of 3)

M.
Martin found $\frac{3}{8}$ of his homework in his sister's room and $\frac{2}{8}$ of his homework in his dog's bed. He never found the rest of his homework. How much was still missing?

Martin encontró $\frac{3}{8}$ partes de sus tareas escolares en el dormitorio de su hermana y $\frac{2}{8}$ partes de sus tareas en la cama de su perro. Nunca encontró el resto de sus tareas. ¿Cuánto todavía faltaba?

N.
Callie's calico cat was $\frac{1}{5}$ orange, $\frac{2}{5}$ white and the remaining fractional part black. What fractional part was the cat black?

El gato calicó de Callie tenía $\frac{1}{5}$ parte color naranja, $\frac{2}{5}$ partes blanca y la parte fraccional restante, negra. ¿Qué fracción del gato era negra?

O.
Meghan's drink was $\frac{1}{6}$ orange juice, $\frac{1}{6}$ pineapple juice, $\frac{1}{6}$ lemonade and the rest water. What fractional part of the drink was water?

La bebida de Meghan era $\frac{1}{6}$ parte jugo de naranja, $\frac{1}{6}$ parte jugo de piña, $\frac{1}{6}$ limonada y el resto, agua. ¿Qué fracción de la bebida era agua?

P.
Carly walked 3.5 miles to school and 4.7 miles home because she stopped by a friend's house after school. How many miles did she walk that day?
Carly caminó 3.5 millas a la escuela y 4.7 millas a su casa porque entró en la casa de un amigo después de la escuela. ¿Cuántas millas caminó ese día?

Q.
Antonio measured wood for his project. His pieces were 3.75 meters, 4.2 meters and 1.06 meters long. How many meters of wood did he have?

Antonio midió madera para su proyecto. Los pedazos medían 3.75 metros, 4.2 metros y 1.06 metros de largo. ¿Cuántos metros de madera tenía?

R.
The odometer on Tym's car read 1205.7 miles in the morning. By that evening, the odometer reading was 1356.9 miles. How far was the car driven that day?

El cuentamillas del vehículo de Tym leía 1205.7 en la mañana. Esa tarde, el cuentamillas leía 1356.9. ¿Cuán lejos viajó el vehículo ese día?

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:

_____

_____

_____

_____

Unit 1 Lesson 3 – Snack Fractions
One per student

String Cheese – Snack Fractions

Problem:
Enrique had five pieces of string cheese to share among himself and three of his brothers.

Questions:
1. What fractional portion of the snack did each person receive?

2. How do you write one portion as a decimal? Percent?

3. What if one person wasn't hungry for the string cheese. What fractional portion of the snack would each person receive then? Draw a picture.

4. How do you write that as a decimal? Percent?

Unidad 1 Lección 3 – Fracciones de refrigerios

Una por estudiante

Queso en tiras - Fracciones de refrigerios

Problema:
Enrique tenía 5 piezas de queso en tiras para compartir entre sí mismo y tres de sus hermanos.

Preguntas:
1. ¿Qué parte fraccional del refrigerio recibió cada persona?

2. ¿Cómo escribes una porción en forma decimal? ¿En porcentaje?

3. ¿Qué tal si una persona no quería queso en tiras? ¿Qué parte fraccional del refrigerio recibiría cada persona entonces? Dibuja una imagen.

4. ¿Cómo se escribe como decimal? ¿Porcentaje?

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

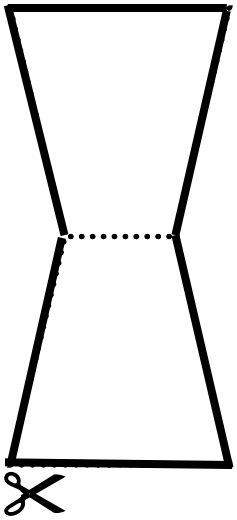
Cómo se juega

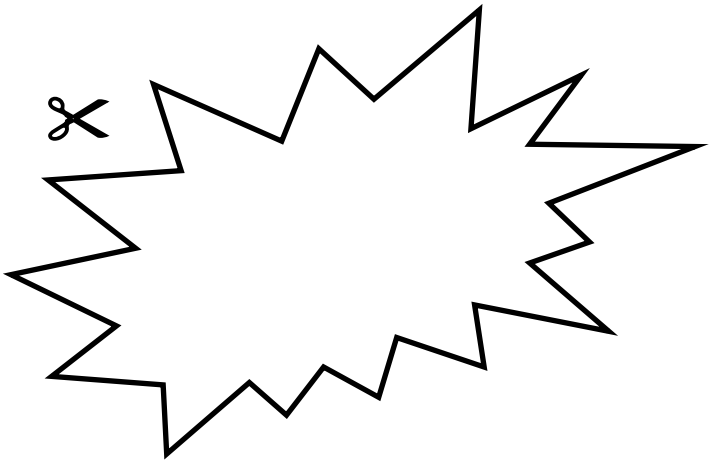
1. Empiece en una de las esquinas. Puede haber más de 1 jugador en cada figura de inicio.
2. Cuando sea su turno, saque una de las tarjetas de juego de su nivel y resuelva el problema.
3. Uno de los otros jugadores usa la clave de respuestas para ver si su respuesta es correcta. Si es correcta, tira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

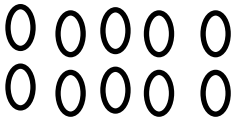
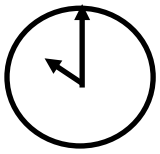
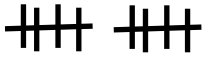
Educator Packet

Unit 2

Warm up: Target Number

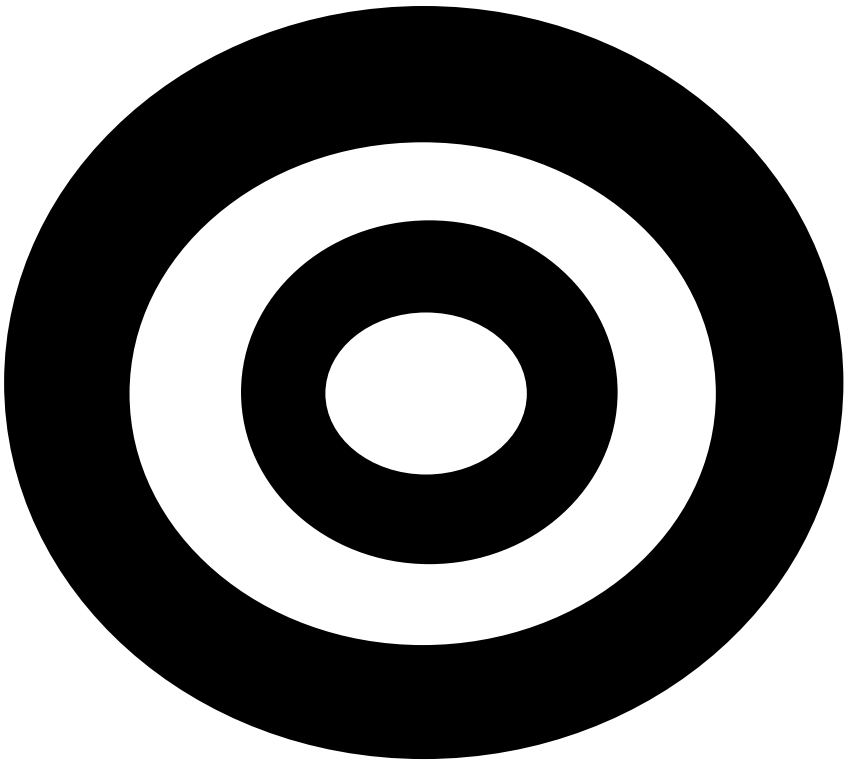
- The task is to represent the target number in different ways in one minute. Do a couple samples with students before starting the timer.
    a. Start all groups with the numbers 12 and 15.
        i. All target numbers are fair to use with students in grades 1 through 8.
        ii. Use numbers 20 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

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***
Grade 5	Multi digit multiplication	***Procedural Fluency***
Grade 6	Multi digit division; multi digit decimal operations	***Procedural Fluency***
Grade 7	Solve two step equations in the form of px + q = r and p(x +q) = r	***Procedural Fluency***
Grade 8	Solve simple 2 x 2 systems of equations by inspection/substitution	***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.

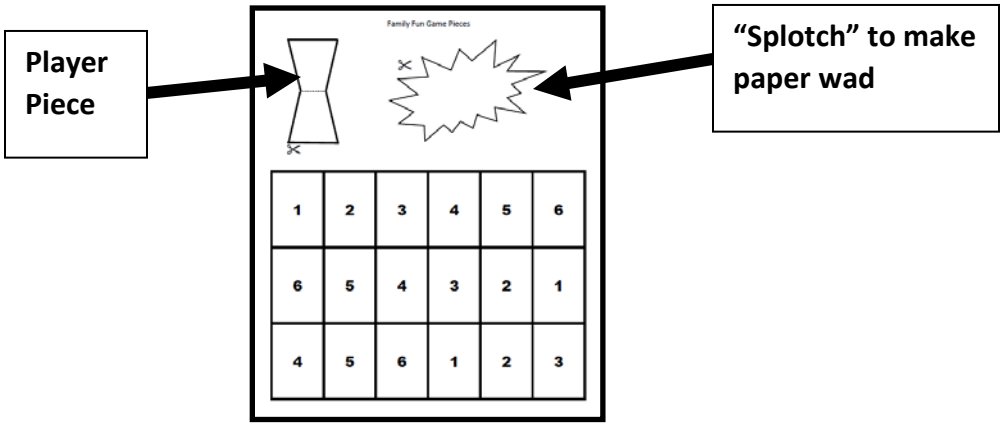
Process:

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:

While the New York State's Next Generations Learning Standards for Grade 5 and Grade 6 do not have a chart of sample word problems, the CGI Chart for Grades 5 and 6 give the students practice multiplying with fractions and decimals. Additionally, the CGI process supports students in reading and solving word problems.

Process:

1. ***Pick one word problem.*** Spend time on the process instead of a quick answer.
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?

	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	The sun shines 24 hours a day during the summer months on the tundra, a far-north terrestrial biome. If summer lasts 84 days in this biome, how many hours of continuous sunshine is that?	The Cuban Tody, a small bird living in the tropical dry forest of Cuba, feeds its chicks up to 140 insects. If there were 560 insects available in the flight area, how many chicks could that feed for a day?	Bears hibernate to avoid extreme cold. During one phase to prepare for hibernation, a bear can eat up to 20,000 calories per day. If the bear eats about 5 times during the day, how many calories would each meal be?
Rate	Moose live in the boreal forest biome. They are great swimmers and can swim up to 5.9 miles per hour. At that rate, how far could they swim in 3 hours?	Moose live in the boreal forest biome. Their normal walking speed is 4 miles per hour. At that rate, how long would it take them to walk 1 mile?	Moose live in the boreal forest biome. They can run 35 miles per hour for short periods. At that rate, how many miles could they run in 20 minutes?
Price	Anna's family visited the Aransas Wildlife Refuge on the shimmering Texas gulf. They each bought a Whooping Crane boat tour ticket for $12.95. If there were 5 in her family, what was the total ticket cost of the boat tour?	Anna wanted to buy drinks on board the tour boat for her family. If she had $20.67, and the drinks cost $3 each, how many drinks could she buy?	Anna spent $57.50 on pictures from her trip to the Aransas Wildlife Refuge. She wanted to give each of her family of 5 a photo album with the same number of photos in it. What would the pictures for each album cost?
Fractions	A capybara, a savanna-living animal and the world's largest rodent, eats 2/3 of a pound of grass per meal. If it eats three meals per day, how many pounds of grass will it eat in a week?	A capybara, a savanna-living animal and the world's largest rodent, eats about 2/3 of a pound of grass in a meal. If there were 6 pounds of grass available to one capybara, how many meals would that make for him?	The banana slug is the second largest terrestrial slug in the world. If it can eat 3/4 of a tablespoon of detritus, or dead organic matter, in a meal, how many meals could it have out of 16 tablespoons?

	Multiplicación	División de medida	División partitiva
Agrupamiento/División	El sol brilla las 24 horas del día durante los meses del verano en la tundra, un bioma terrestre. Si el verano dura 84 días en este bioma, ¿durante cuántas horas brillará el sol continuamente?	El barrancolí cubano, un pájaro pequeño que vive en el bosque seco tropical de Cuba, alimenta a sus pichones hasta 140 insectos. Si hubiese 560 insectos disponibles en el área de vuelo, ¿cuántos polluelos pudiesen alimentarse con esa cantidad de insectos al día?	Los osos invernan huyéndole al frío extremo. Durante una fase en la que se preparan para invernar, un oso puede ingerir hasta 20,000 calorías al día. Si el oso come alrededor de 5 veces al día, ¿cuántas calorías ingiere cada vez que come?
Razón	Los alces viven en el bioma del bosque boreal. Son grandes nadadores y pueden nadar a una velocidad de hasta 5.9 millas por hora. A esa razón, ¿cuán lejos pueden nadar durante 3 horas?	Los alces viven en el bioma del bosque boreal. Caminan normalmente a una velocidad de 4 millas por hora. A esa razón, ¿cuánto tiempo les tomaría caminar 1 milla?	Los alces viven en el bioma del bosque boreal. Pueden galopar a una velocidad de 35 millas por hora durante periodos breves. A esa razón, ¿cuántas millas podrían galopar durante 20 minutos?
Precio	La familia de Anna visitó el Refugio Nacional de Vida Silvestre de Aransas, ubicado en el golfo reluciente de Tejas. Cada uno de ellos compró una excursión en bote Whooping Crane por $12.95. Si había 5 personas en su familia, ¿cuál fue el total de los boletos para la excursión en bote?	Anna quería comprar bebidas a bordo del botepara su familia. Si tenía $20.67 y cada bebida costaba $3, ¿cuántas bebidas podía comprar?	Anna gastó $57.50 en fotografías del viaje al Refugio Nacional de Vida Silvestre de Aransas. Quería darle a cada persona de su familia de 5, un álbum de fotos con la misma cantidad de fotos en cada uno. ¿Cuánto costarían las fotos de cada álbum?
Fracciones	Los árboles de arce, roble y abedul son comunes en el bosque templado caducifolio. Cuando estaba verificando la combinación de estos 3 árboles en un radio de 10 millas, un investigador encontró que los arces tenían la mitad de la combinación y los abedules tenían alrededor de una quinta parte de la combinación. ¿Qué fracción de la combinación sería la de los robles?	Un carpincho, un animal que vive en la sabana y el roedor más grande del mundo, ingiere alrededor de 2/3 de libra de hierba en cada comida. Si hubiera 6 libras de hierba disponibles para cada carpincho, ¿cuántas comidas podría comer el carpincho?	La babosa del plátano es la segunda babosa en tamaño del mundo. Si puede comer ¾ de una cucharada de detritus, o materia orgánica muerta, en cada comida, ¿cuántas comidas puede comer de 16 cucharadas?

Materials

- 2 paper dessert plates
- 2 paper towels
- 1 plastic knife
- 2 pieces wax paper
- 2 pair of scissors
- 2 cups trail mix (pre-packaged or home-made)

Allergy Warning – please substitute a nut-free mix for the entire class if nut allergies are present.

All items listed above per partner pair

- **BLM** Trail Mix-Snack Fractions
- **BLM** Trail Mix-Snack Fractions Teacher Guide

Math Vocabulary

array model
area model
factors
products
multiples
prime factors
greatest common factor
least common multiple

Literature Vocabulary

biomes
terrestrial
visitors
dazzling
shimmering
deciduous
temperate

Unit 2, Lesson 2 Grades 5-6

Snack Fractions

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

Math Objectives

- Use addition, subtraction, multiplication and division to solve problems involving fractions, decimals, ratios, and percents.
- Convert between fractions, decimals, and percents.
- Estimate to find solutions to problems involving fractions, decimals, and percents.

Language Objectives

- Discuss how fractions, decimals, ratios, and percents can be used to solve real-world problems.

Snack Fractions

Tell students they will use the same process today that they used in the Snack Fraction for Lesson 1. Students should have the skills to answer these in small groups. Have the students work through the BLM before sharing the actual snack.

Circulate the room while students are working on the BLM, asking questions as needed to guide, redirect, extend:

QUESTIONS

- What does this fraction mean?
- How did you know where to "cut" the trail mix?
- How did you change your decimal to a percent?

Once the activity is complete, let them enjoy their trail mix!

Snack Fraction Journal Writing: BLM Trail Mix-Snack Fractions

Explain how you found the percent for two-fifths of the trail mix.

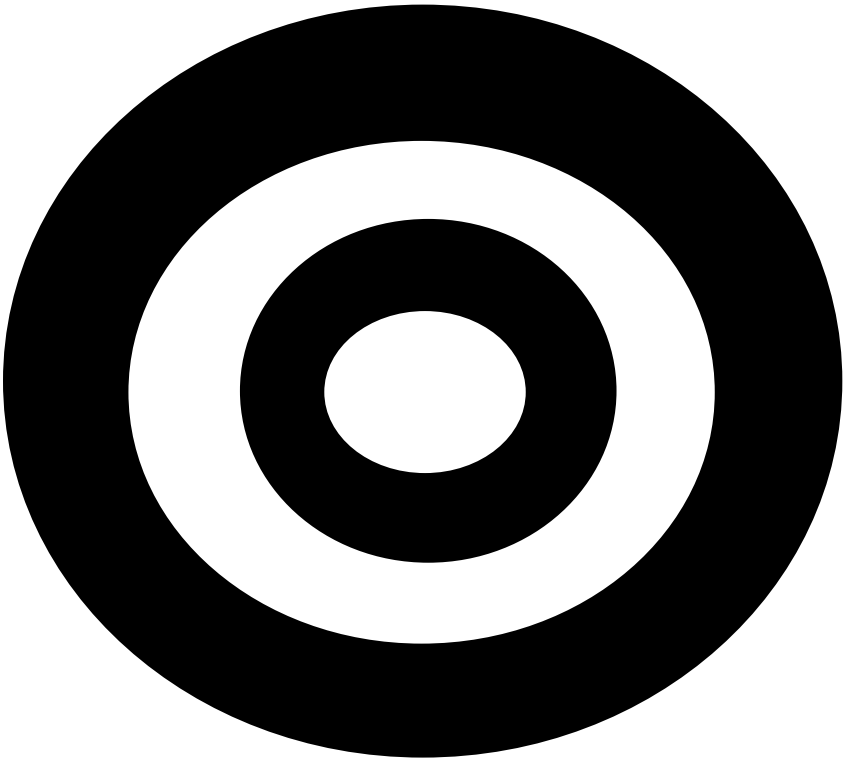
Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Summer Math

Student Packet/Paquete de alumno

Unit 2

English/Español



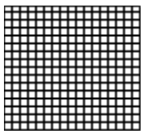
Target Number

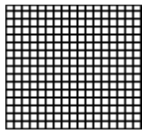
Units 2 Lesson 3 – FAMILY FUN
One per student for home
One per partner pair in class

*Print on **yellow** paper.*

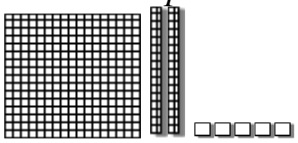
Family Fun – Problem Cards (1 of 3)

A.

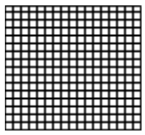
When  represents one, write the decimal for:

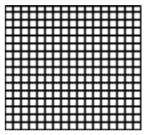


Cuando *representa uno, escribe el decimal para:*

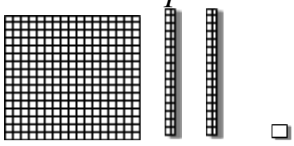


B.

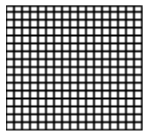
When  represents one, write the decimal for:

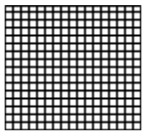


Cuando *representa uno, escribe el decimal para:*

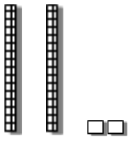


C.

When  represents one, write the decimal for:



Cuando *representa uno, escribe el decimal para:*



D.

Marty ate $\frac{1}{6}$ of the pizza. Carrie ate $\frac{2}{6}$ of the pizza. They left the rest for their brother. What fractional part of the pizza did they leave for their brother?

Marty se comió $\frac{1}{6}$ parte de la pizza. Carriese comió $\frac{2}{6}$ partes de la pizza. Dejaron el resto para su hermano. ¿Qué fracción de la pizza dejaron para su hermano?

E.

Walter took $\frac{3}{8}$ of his sport cards to school. What fractional part of the cards did he leave at home?

Walter llevó $\frac{3}{8}$ de sus cartas deportivas a la escuela. ¿Qué fracción de las cartas dejó en su casa?

F.

Alex walked $\frac{5}{8}$ of the way to school. She rode a city bus the rest of the way. What fractional part of the trip was on the city bus?

Alex caminó $\frac{5}{8}$ partes del camino a la escuela. Viajó en autobús el resto del camino. ¿Cuán lejos viajó en el autobús?

Units 2 Lesson 3 – FAMILY FUN
One per student for home
One per partner pair in class

*Print on **yellow** paper.*

Family Fun – Problem Cards (2 of 3)

G.
Meghan took $185.00 from her bank account to buy new clothes for school. She had $76.45 left and put it back in the bank after buying clothes. What did her clothes cost?

Meghan retiró $185.00 de su cuenta de banco para comprar ropa nueva para la escuela. Tenía un remanente de $76.45 y lo depositó en el banco después de comprar la ropa. ¿Cuánto costó su ropa?

H.
Kit walked 2.7 miles to school and 3.7 miles home because she stopped by a friend's house after school. How many miles did she walk that day?

Kit caminó 2.7 millas a la escuela y 3.7 miles a su casa porque entró en la casa de un amigo después de la escuela.¿Cuántas millas caminó ese día?

I.
The odometer on Tym's car read 13005.7 in the morning. By that evening, the odometer reading was 13056.9. How far was the car driving that day?

El cuentamillas del vehículo de Tym leía 13005.7 en la mañana. Esa tarde, el cuentamillas leía 13056.9. ¿Cuán lejos viajó el vehículo ese día?

J.

What is the GCF of 45 and 63?

¿Cuál es el MFC de 45 y 63?

K.

What is the GCF of 35 and 14?

¿Cuál es el MFC de 35 y 14?

L..

What is the GCF of 18 and 27?

¿Cuál es el MFC de 18 y 27?

Units 2 Lesson 3 – FAMILY FUN
One per student for home
One per partner pair in class

*Print on **yellow** paper.*

Family Fun – Problem Cards (3 of 3)

M.

What is the LCM of 2 and 14?

¿Cuál es el MCM de 2 y 14?

N.

What is the LCM of 14 and 42?

¿Cuál es el MCM de 14 y 42?

O.

What is the LCM of 16 and 8?

¿Cuál es el MCM de 16 y 8?

P.

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

Q.

$$\frac{5}{6} - \frac{2}{3}$$

R.

$$\frac{2}{8} + \frac{3}{8}$$

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:

_____

_____

_____

_____

Unit 2 Lesson 2 – Snack Fractions
One per student

Trail Mix – Snack Fractions

Divide the snack equally between the two of you. Work with your partner to solve the problems.

1. What fraction represents your portion of trail mix out of the whole?
   word _____ fraction _____
   decimal _____ percent _____

2. Shade the diagram to represent your portion.

Now pretend there are five of you sharing the whole snack.

3. What fraction represents your portion of trail mix out of the whole?
   word _____ fraction _____
   decimal _____ percent _____

4. Shade the diagram to represent your portion.

5. What fraction represents your portion and your partner's portion together out of the whole?
   word _____ fraction _____
   decimal _____ percent _____

6. Shade the diagram to represent both of your portions.

Unit 2 Lesson 2 – Snack Fractions
One per student

Trail Mix – Snack Fractions

Divide el refrigerio igualmente entre los dos de Ustedes. Trabaja con tu compañero para resolver los problemas.

1. ¿Qué fracción representa tu porción del refrigerio del entero?

palabra	_____	fracción	_____
decimal	_____	porcentaje	_____

2. Sombrea el círculo para representar tu porción

Ahora imagine que son cinco compartiendo al refrigerio.

3. ¿Qué fracción representa tu porción del entero?

palabra	_____	fracción	_____
decimal	_____	porcentaje	_____

Sombrea el círculo para representar tu porción.

4. ¿Qué fracción representa tu porción y la de tu compañero juntos del entero?
5. palabra _____ fracción _____
6. decimal _____ porcentaje _____

7. Sombrea el círculo para representar las dos porciones.

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

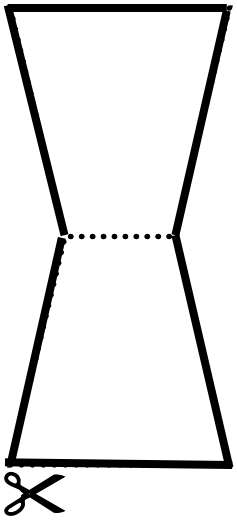
Cómo se juega

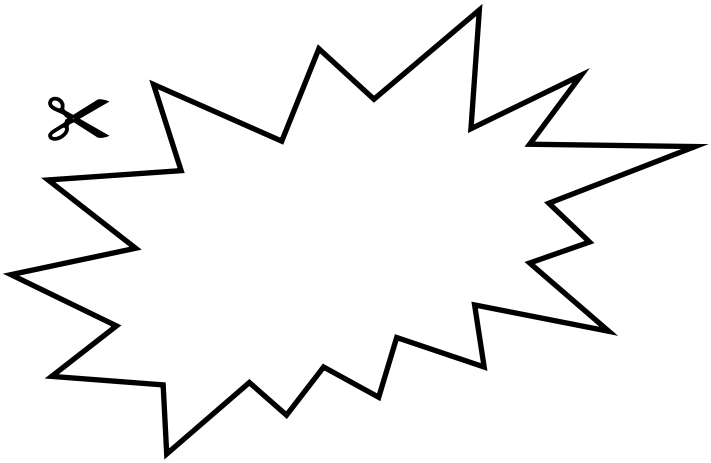
1. Empiece en una de las esquinas. Puede haber más de 1 jugador en cada figura de inicio.
2. Cuando sea su turno, saque una de las tarjetas de juego de su nivel y resuelva el problema.
3. Uno de los otros jugadores usa la clave de respuestas para ver si su respuesta es correcta. Si es correcta, tira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

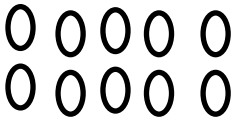
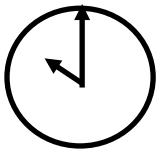
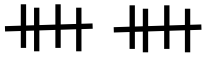
Educator Packet

Unit 3

Warm up: Target Number

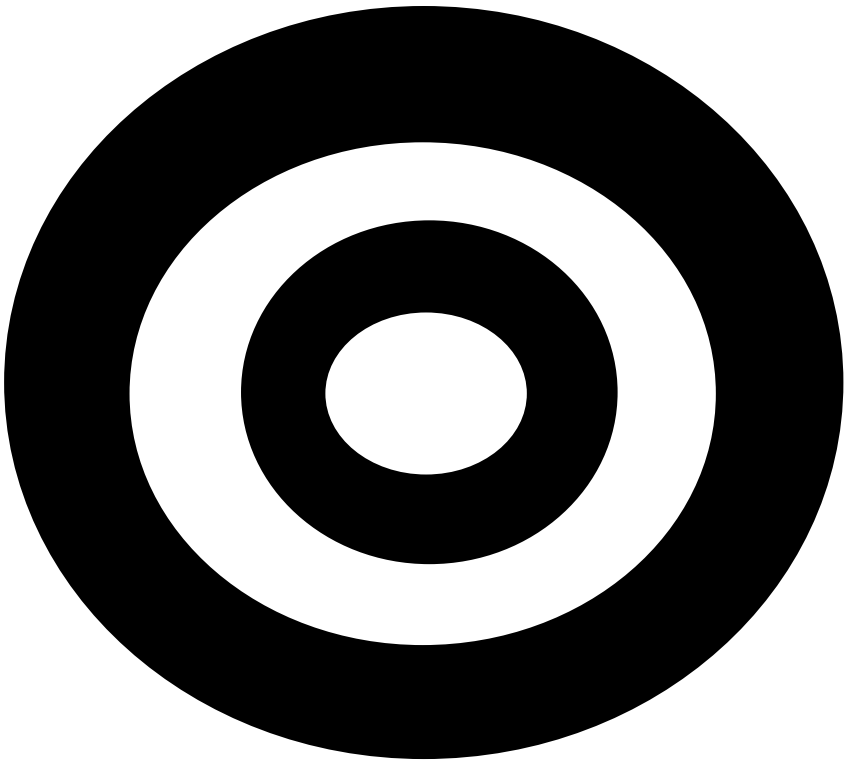
- The task is to represent the target number in different ways in one minute. Do a couple samples with students before starting the timer.
    a. Start all groups with the numbers 12 and 15.
        i. All target numbers are fair to use with students in grades 1 through 8.
        ii. Use numbers 20 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

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***
Grade 5	Multi digit multiplication	***Procedural Fluency***
Grade 6	Multi digit division; multi digit decimal operations	***Procedural Fluency***
Grade 7	Solve two step equations in the form of px + q = r and p(x +q) = r	***Procedural Fluency***
Grade 8	Solve simple 2 x 2 systems of equations by inspection/substitution	***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.

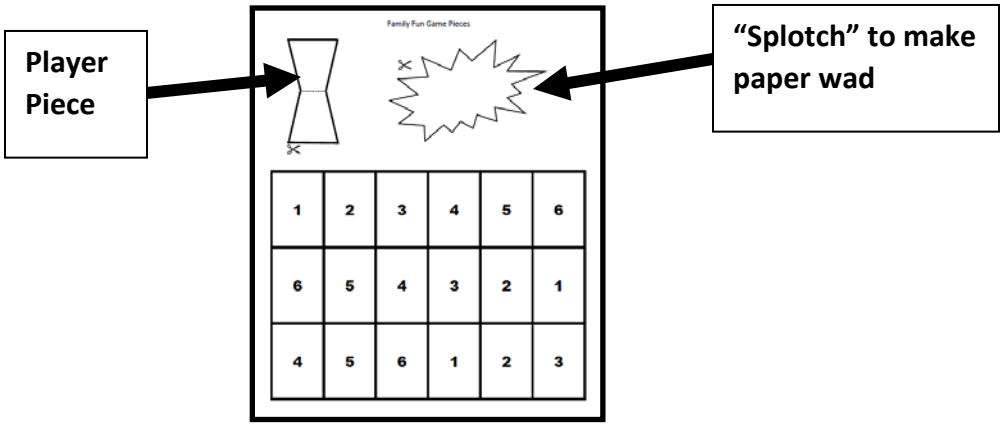
Process:

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:

While the New York State's Next Generations Learning Standards for Grade 5 and Grade 6 do not have a chart of sample word problems, the CGI Chart for Grades 5 and 6 give the students practice multiplying with fractions and decimals. Additionally, the CGI process supports students in reading and solving word problems.

Process:

1. ***Pick one word problem.*** Spend time on the process instead of a quick answer.
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?

	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 4 dozen lemons in a crate. How many lemons are in 12 crates?	The grocer packed 15 dozen lemons into boxes. If he packed half a dozen lemons in each box, how many boxes would he need?	Tina had 65 lemons. She plans to make 15 pitchers of lemonade from them. How many lemons will she use in each pitcher?
Rate	Tina squeezes fresh lemons to make her super duper lemonade. If Tina can squeeze 3 lemons in 60 seconds, how many lemons can she squeeze in a half hour?	Tina has a sack of 224 lemons. If she uses 30 lemons per day, how many days will the sack of lemons last?	Tina has 400 lemons that must last her 2 weeks. How many lemons can she use per day?
Price	Tina sold her super duper ice cold lemonade for 50 cents per glass. In one week, Tina sold 139 glasses. How much money did Tina take in that week?	Tina sold $173.00 worth of lemonade. If each glass cost 50 cents, how many glasses did Tina sell?	Tina sold $69.00 worth of lemonade yesterday. If she sold 138 glasses, what did she charge for each glass?
Fractions	The average glass of lemonade contains the juice of about $\frac{1}{4}$ of a lemon. If Tina sold 15 glasses, how many lemons did she use?	Tina has $\frac{3}{4}$ of a sack of lemons. A full sack weighs 50 pounds. How many pounds of lemons does Tina have?	Tina has 2/3 of a bag of lemons. It weighs 40 pounds. How many pounds does a whole sack weigh?

CGI Problems Unit 3

	Multiplicación	División de medidas	División partitiva
Agrupamiento y división	Hay 4 docenas de limones en una caja. ¿Cuántos limones hay en 12 cajas?	El tendero empaquetó 15 docenas de limones en cajas. Si empaquetó media docena de limones en cada caja, ¿cuántas cajas necesita?	Tina tenía 65 limones. Con ellos, piensa hacer 15 jarras de limonada. ¿Cuántos limones va a usar en cada jarra?
Razón	Tina exprime limones frescas para hacer su limonada súper híper fría. Si Tina puede exprimir 3 limones en 60 segundos, ¿cuántos limones puede exprimir en media hora?	Tina tiene un saco de 224 limones. Si usa 30 al día, ¿cuántos dias va a alcanzar el saco?	Tina tiene 400 limones que le tienen que alcanzar dos semanas. ¿Cuántos limones puede usar cada día?
Precio	Tina vendió su limonada súper híper fría por 50 centavos el vaso. En una semana, Tina vendió 139 vasos. ¿Cuánto dinero se ganó Tina esa semana?	Tina vendió $173.00 de limonada. Si cada vaso costó 50 centavos, ¿cuántos vasos vendió?	Tina vendió $69.00 de limonada ayer. Si vendió 138 vasos, ¿cuánto cobró por vaso?
Fracciones	Como promedio, un vaso de limonada contiene el jugo de $\frac{1}{4}$ de un limón. Si Tina vendió 15 vasos, ¿cuántos limones usó?	Tina tiene $\frac{3}{4}$ de un saco de limones. Un saco lleno pesa 50 libras. ¿Cuántas libras de limones tiene Tina?	Tina tiene 2/3 de un saco de limones. Pesa 40 libras. ¿Cuántas libras pesa un saco completamente lleno?

Materials
- 3 paper dessert plates
- 3 paper towels
- 6 pieces of beef jerky

All items above per group of three
- **BLM** Beef Jerky-Snack Fractions
- **BLM** Beef Jerky-Snack Fractions Teacher Guide

Math Vocabulary
ratio
proportion
equivalent ratios
variables

Literature Vocabulary
detective
victim
suspect
culprit
clue
evidence
motive

Unit 3, Lesson 2 — Grades 5-6

Snack Fractions

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

Math Objectives
- Represent and solve addition and subtraction of fractions with like and unlike denominators referring to the same whole using objects and pictorial models, including area models.
- Add and subtract positive rational numbers fluently.
- Represent and solve multiplication of a whole number and a fraction that refers to the same whole using objects and pictorial models, including area models.

Language Objectives
- Discuss how fractions, decimals, ratios, and percents can be used to solve real-world problems.

Snack Fractions
The Snack Fraction activities for this unit will focus on combining fractional parts and dividing into thirds. This means they will work in groups of three. A Teacher Guide for the BLM is provided.

The snack for this lesson represents a set model *(group of objects defined as a whole)*. The six pieces of jerky are boxed in to show that it is considered a whole. **The snack is NOT considered six wholes.**

QUESTIONS
- What is the whole in this situation?
- How do I break this up into equal shares?
- What does that fraction represent?
- Does this fraction have an easily calculated decimal equivalent?
- How can you find the decimal of this fraction?

Once the activity is complete, let them enjoy their beef jerky!

Snack Fraction Journal Writing: BLM Beef Jerky-Snack Fractions
Explain why $\frac{2}{3} + \frac{1}{3} = 1$ whole.

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

Beef Jerky – Snack Fractions

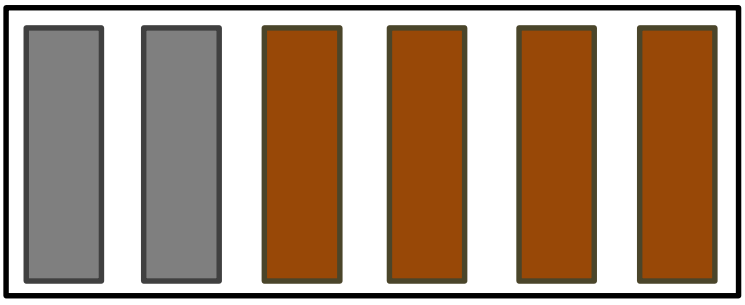
Divide the snack equally between the THREE of you. Work with your group to solve the problems.

1. What fraction represents your portion of the beef jerky out of the whole?
   word two-sixths or one-third fraction $\frac{2}{6} = \frac{1}{3}$
   decimal 0.33 percent 33%

2. What fraction represents your portion and one partner out of the whole?
   word four-sixths or two-thirds fraction $\frac{4}{6} = \frac{2}{3}$
   decimal 0.66 percent 66%

3. What fraction represents your portion and two partners out of the whole?
   word six-sixths or one whole fraction $\frac{6}{6}$ = 1 whole
   decimal 1.0 percent 100%

4. Using the picture, represent your portion when shared between you and your two partners.

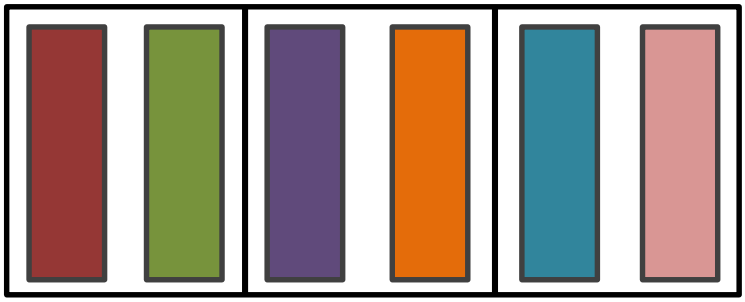


Now pretend there are six of you sharing the whole snack.

5. What fraction represents your portion and one partner out of the whole?
   word one-sixth fraction $\frac{1}{6}$

6. What fraction represents your portion and two other partners out of the whole?
   word three-sixths fraction $\frac{3}{6} = \frac{1}{2}$
   decimal 0.5 percent 50%

7. Using the picture, prove that $\frac{2}{6}$ is equivalent to $\frac{1}{3}$. Each colored jerky represents $\frac{1}{6}$. Lines show $\frac{1}{3}$.

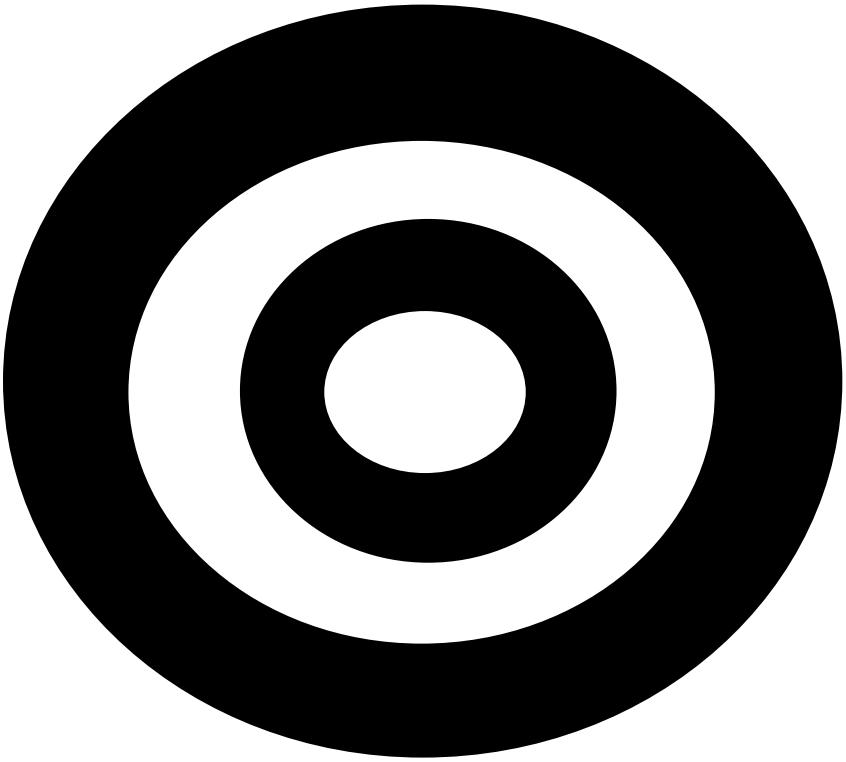


Summer Math

Student Packet/Paquete de alumno

Unit 3

English/Español

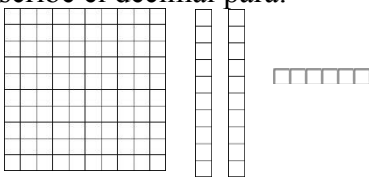


Target Number

Units 3 Lesson 3 – FAMILY FUN
One per student for home
One per partner pair in class
*Print on **yellow** paper.*
Family Fun – Problem Cards (1 of 3)

A.
When  represents one, write the decimal for:

Si  representa uno, escribe el decimal para:



B.
Marty ate 2/6 of the pizza. Carrie ate 3/6 of the pizza. They left the rest for their brother. What fractional part of the pizza did they leave for their brother?

Marty se comió 2/6 partes de la pizza. Carriese comió 3/6 partes de la pizza. Dejaron el resto para su hermano.¿Qué fracción de la pizza dejaron para su hermano?

C.
The odometer on Tym's car read 32,345.07 in the morning. By that evening, Tym had driven 425.7 miles. What did the odometer read then?

El cuentamillas del vehículo de Tym leía 32,345.07 por la mañana. Esa tarde, Tymhabía viajado 425.7 millas. ¿Qué leía el cuentamillas entonces?

D.
Meghan took $287.00 from her bank account to buy new clothes for school. She had $76.45 left and put it back in the bank after buying clothes. What did her clothes cost?

Meghan retiró $287.00 de su cuenta de banco para comprar ropa para la escuela. Le sobró la cantidad de $76.45 y la depositó en el banco después de comprar la ropa. ¿Cuánto costó la ropa?

E.
Write a decimal representation of:

Escribe una representación decimal de:

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

F.
Write a decimal representation of:

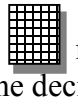
Escribe una representación decimal de:

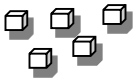
$$\frac{7}{100}$$

Units 3 Lesson 3 – FAMILY FUN
One per student for home
One per partner pair in class

*Print on **yellow** paper.*

Family Fun – Problem Cards (2 of 3)

G.
When  represents one, write the decimal and percent for:



Cuando  *representa uno, escribe el decimal y el porcentaje para:*

H.
What is the GCF of 45 and 27?

¿Cuál es máximo factor común de 45 y 27?

I.
What is the LCM of 6 and 9?

¿Cuál es mínimo multiplo común de 6 y 9?

J.
Use color tiles to model the ratio 4:1

Usa fichas de colores para modelar la razón: 4:1

K.
Use color tiles to model the ratio 5:3

Usa fichas de colores para modelar la razón: 5:3

L.
Use color tiles to model the ratio 3:7

Usa fichas de colores para modelar la razón: 3:7

Units 3 Lesson 3 – FAMILY FUN
One per student for home
One per partner pair in class

*Print on **yellow** paper.*

Family Fun – Problem Cards (3 of 3)

M.
Use two different ways to express the ratio 3 to 4.

Expresa la razón 3 a 4 de dos maneras diferentes.

N.
Use two different ways to express the ratio 6 to 1.

Expresa la razón 6 a 1 de dos maneras diferentes.

O.
Use two different ways to express the ratio 3 to 5.

Expresa la razón 3 a 5 de dos maneras diferentes.

P.
Solve for x.
Calcula x.

$$\frac{1}{3} = \frac{x}{9}$$

Q.
Solve for *x*.
Calcula x.

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

R.
Solve for *x*.
Calcula x.

$$\frac{3}{4} = \frac{x}{12}$$

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:

_____

_____

_____

_____

Unit 3 Lesson 1 – Snack Fractions
1 per student

Beef Jerky – Snack Fractions

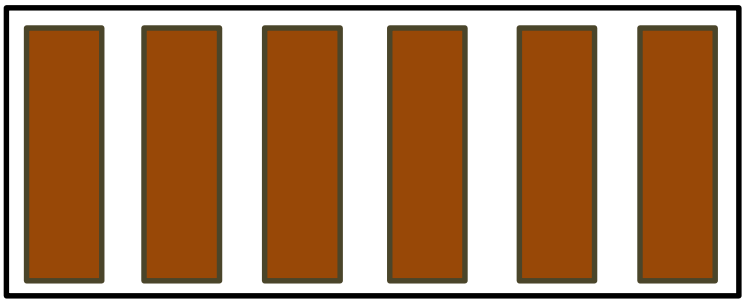
Divide the snack equally between the THREE of you. Work with your group to solve the problems.

1. What fraction represents your portion of the beef jerky out of the whole?
   word _____ fraction _____ = _____
   decimal _____ percent _____

2. What fraction represents your portion and 1 partner out of the whole?
   word _____ fraction _____ = _____
   decimal _____ percent _____

3. What fraction represents your portion and 2 partners out of the whole?
   word _____ fraction _____ = _____
   decimal _____ percent _____

4. Using the picture, represent your portion when shared between you and your 2 partners.

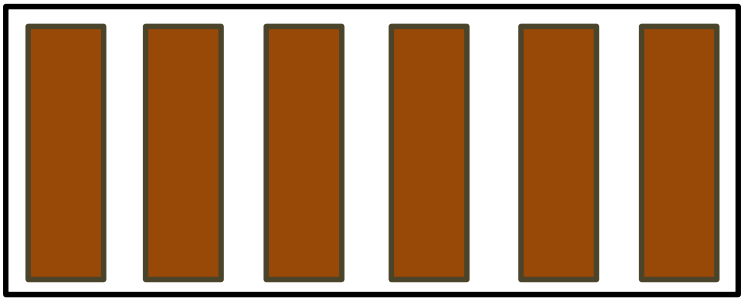


Now pretend there are 6 of you sharing the whole snack.

5. What fraction represents your portion and 1 partner out of the whole?
   word _____ fraction _____

6. What fraction represents your portion and 2 other partners out of the whole?
   word _____ fraction _____ = _____
   decimal _____ percent _____

7. Using the picture, prove that $\frac{2}{6}$ is equivalent to $\frac{1}{3}$.



Unit 3 Lesson 1 – Snack Fractions
One per student

Beef Jerky – Snack Fractions

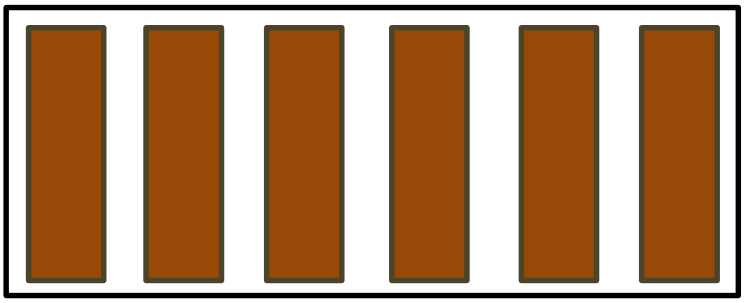
Divide el refrigerio de manera equitativa entre ustedes TRES. Colabora con tu grupo para resolver los problemas.

1. ¿Qué fracción representa tu porción del pepinillo respecto al entero?
   palabras _____ fracción _____
   decimal _____ porcentaje _____

2. ¿Qué fracción representa tu porción del pepinillo y un compañero respecto al entero?
   palabras _____ fracción _____
   decimal _____ porcentaje _____

3. Qué fracción representa tu porción del pepinillo y dos compañero respecto al entero?
   palabras _____ fracción _____
   decimal _____ porcentaje _____

4. Usando el dibujo, representa tu porción al compartirla entre ti y tus dos compañeros.

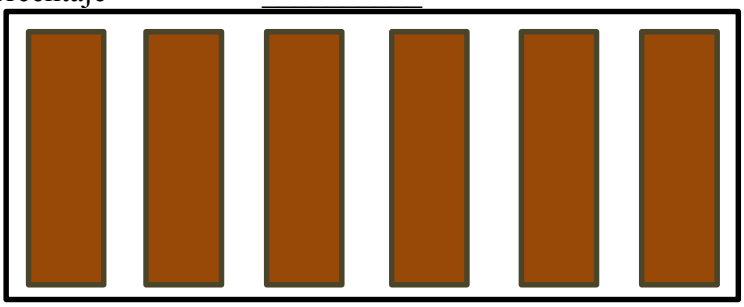


Ahora imagina que hay seis compartiendo el refrigerio entero.

5. ¿Qué fracción representa tu porción del pepinillo y un compañero respecto al entero?
   palabras _____ fracción _____

6. Qué fracción representa tu porción del pepinillo y dos compañero respecto al entero?
   palabras _____ fracción _____
   decimal _____ porcentaje _____

7. Usando el dibujo, prueba que $\frac{2}{6}$ es equivalente a $\frac{1}{3}$.



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

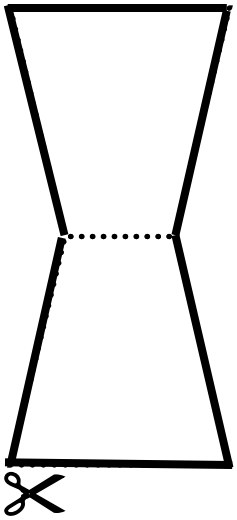
Cómo se juega

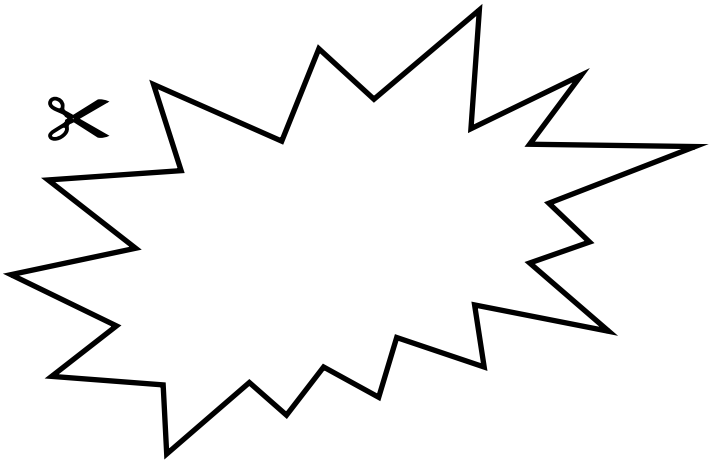
1. Empiece en una de las esquinas. Puede haber más de 1 jugador en cada figura de inicio.
2. Cuando sea su turno, saque una de las tarjetas de juego de su nivel y resuelva el problema.
3. Uno de los otros jugadores usa la clave de respuestas para ver si su respuesta es correcta. Si es correcta, tira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

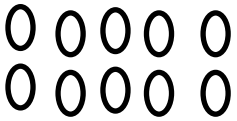
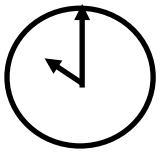
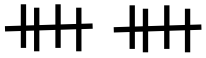
Educator Packet

Unit 4

Warm up: Target Number

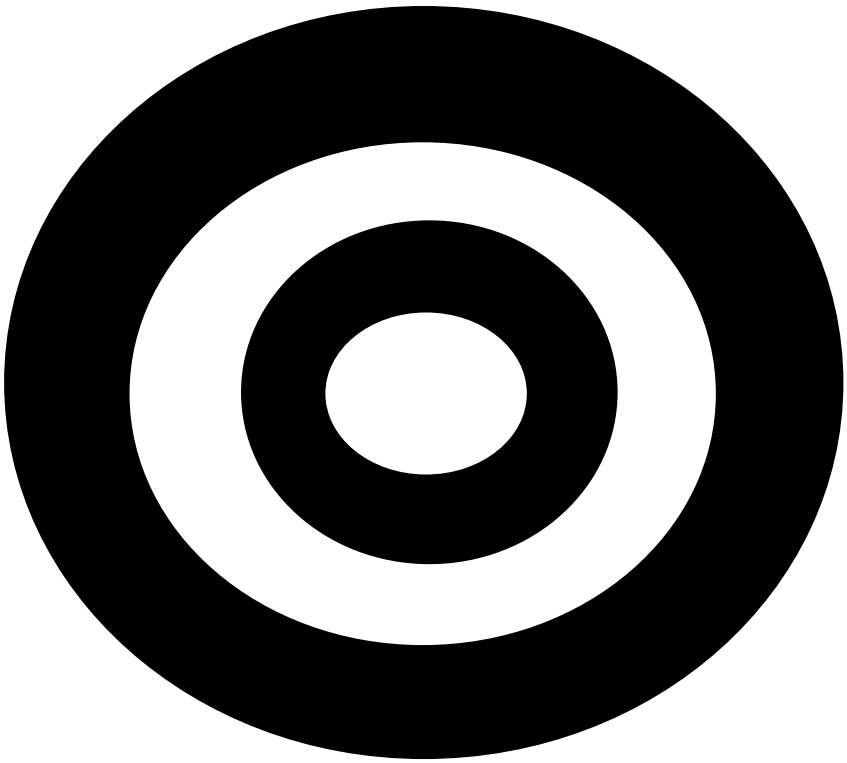
- The task is to represent the target number in different ways in one minute. Do a couple samples with students before starting the timer.
    a. Start all groups with the numbers 12 and 15.
        i. All target numbers are fair to use with students in grades 1 through 8.
        ii. Use numbers 20 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

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***
Grade 5	Multi digit multiplication	***Procedural Fluency***
Grade 6	Multi digit division; multi digit decimal operations	***Procedural Fluency***
Grade 7	Solve two step equations in the form of px + q = r and p(x +q) = r	***Procedural Fluency***
Grade 8	Solve simple 2 x 2 systems of equations by inspection/substitution	***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.

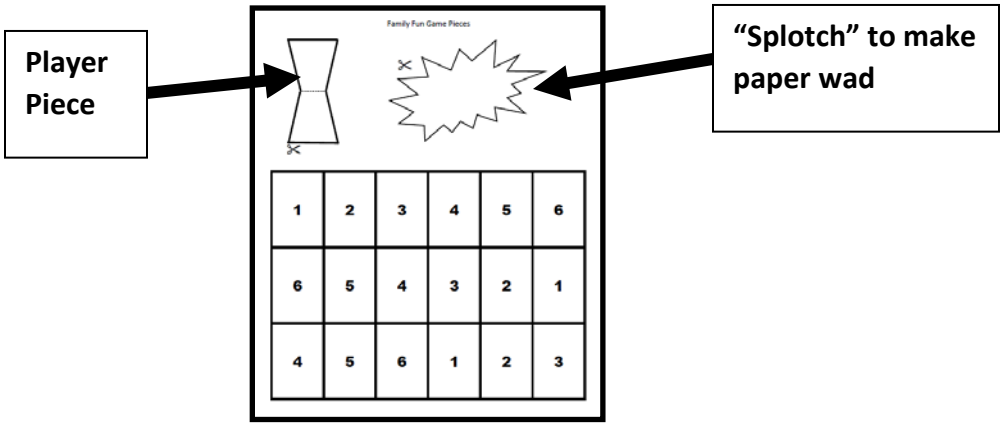
Process:

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:

While the New York State's Next Generations Learning Standards for Grade 5 and Grade 6 do not have a chart of sample word problems, the CGI Chart for Grades 5 and 6 give the students practice multiplying with fractions and decimals. Additionally, the CGI process supports students in reading and solving word problems.

Process:

1. ***Pick one word problem.*** Spend time on the process instead of a quick answer.
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?

	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 7,8	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 72, 8
Rate	Tortoise walks at a rate of 0.27 km/h. How far can he walk in 4 hours?	Tortoise walks at a rate of 0.27 km/h. How many hours will it take to walk 1 km?	Tortoise walked 0.15 km in 30 minutes. If he walked the same speed the whole way, how far did he walk in 20 minutes?
Price	The golden eggs the goose laid were worth $642. 75 each. If the goose lays 7 eggs in a week, how much money does its owner make in one week? How much in one month? How much in one year?	The golden eggs are worth $1532 per ounce. How many ounces could be purchased for $12,656?	The goose laid 14 golden eggs for a total value of $21,488. How much was each egg worth?
Fractions	$\frac{3}{4}$ of a cup of pebbles will raise the water level in the pitcher by $\frac{1}{2}$ an inch. How many cups of pebbles will it take to raise the water level 7 inches?	The crow dropped enough pebbles in the pitcher to raise the water 6 inches. If it takes 2/3 of a cup of pebbles to raise the water 1 inch, how many cups of pebbles did the crow drop in?	Crow dropped 7-3/4 cups of pebbles into the pitcher. If the water raised 8 inches, how many cups of pebbles does it take to raise the water one inch?

CGI Problems for Unit 4

	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 7,8	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 72, 8
Velocidad	La tortuga camina a una velocidad de 0.27 km/h. ¿Qué distancia puede recorrer en 4 horas?	La tortuga camina a una velocidad de 0.27 km/h. ¿Cuántas horas le llevará caminar 1 km?	La tortuga caminó 0.15 km en 30 minutos. Si caminó a la misma velocidad en todo el recorrido, ¿cuánto recorrió en 20 minutos?
Precio	Los huevos dorados que puso la gansa tenían un valor de $642. 75 cada uno. Si la gansa puso 7 huevos en una semana, ¿cuánto dinero ganó su dueño en una semana? ¿Cuánto ganó en un mes? ¿Cuánto ganó en un año?	Los huevos dorados valen $1532 por onza. ¿Cuántas onzas se podrían comprar con $12, 656?	La gansa puso 14 huevos dorados por un valor total de $21, 488. ¿Cuánto valía cada huevo?
Fracciones	$\frac{3}{4}$ de una taza de piedras elevaría el nivel del agua en el jarro en $\frac{1}{2}$ pulgada. ¿Cuántas tazas de piedras se necesitarían para elevar el nivel del agua en 7 pulgadas?	El cuervo dejó caer suficientes piedras en el jarro para subir el nivel del agua en 6 pulgadas. Si se necesitan 2/3 de una taza de piedras para elevar el nivel del agua en 1 pulgada, ¿cuántas tazas de piedras dejó caer el cuervo en ella?	El cuervo dejó caer 7-3/4 tazas de piedras en el jarro. Si el agua se elevó 8 pulgadas, ¿cuántas tazas de piedras se necesitarían para elevar el nivel del agua en 1 pulgada?

Materials
- balance (no weights necessary)
- 2 100-calorie snack packs (heaviest weight possible)
- 2 paper dessert plates
- 2 paper towels

All items listed above per partner pair
- **BLM** 100-Calorie Snack Packs-Snack Fractions
- **BLM** 100-Calorie Snack Packs-Snack Fractions Teacher Guide

Math Vocabulary
unlike denominators
like denominators
unit price
ratio
proportion
percent
greatest common factor
least common multiple

Literature Vocabulary
moral
trait
patient
impatient
greedy
generous
adventurous
cautious

Teacher Note
Each pair of students MUST have the same 100-calorie snack weight. In other words, if partner A has a snack that weighs 1.03oz, partner B must have a snack that weighs 1.03oz.

It is okay for a group to have a different snack or weight than another group.

Unit 4, Lesson 2 — Grades 5-6

Snack Fractions

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

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions, decimals, ratios, and percents.
- Convert between fractions, decimals, and percents.
- Estimate to find solutions to problems involving fractions, decimals, and percents.

Language Objectives
- Discuss how fractions, decimals, ratios, and percents can be used to solve real-world problems.

Snack Fractions
The Snack Fraction activity in this unit is different than any other students have completed up to this point. The 100-calorie snack packs are packaged according to weight as opposed to quantity. The lesson will continue to focus on combining and separating fractional parts as well as dividing into fourths, but based on the weight of the snack, not the quantity of the snack in the package. It will be easier for students to find weight measurements with the heaviest snack pack you can find. A Teacher Guide for the BLM is provided.

Be explicit that this is a SET model where the whole is defined as TWO snack packs, not one. Same concept as the Beef Jerky activity.

QUESTIONS
- What is the whole in this situation?
- How do I break this up into equal shares?
- Does this fraction have an easily calculated decimal equivalent?
- How can you find the decimal of this fraction?
- How did you calculate the percent?

Once the activity is complete, let them enjoy their snack! *(If today's portion is too small, you may give them an additional pickle to eat.)*

Snack Fraction Journal Writing: BLM Fruit Kabob-Snack Fractions
Justify how it is possible for 12 meats out of 40 ingredients to be more than 50% of the ingredients.

Objectives
Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 4 Lesson 2 – Snack Fractions
One per student

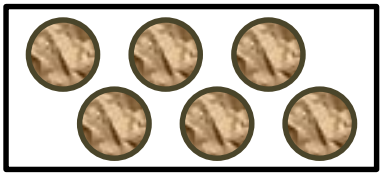
100-Calorie Snack Packs – Snack Fractions Teacher Guide

Some answers will vary based on the weight of the snack students are given. This key will use the snack pack with three mini cakes and a weight of 1.125 oz (or 32 grams) as an example.

1. Draw a pictorial representation of the whole in the space provided. Set Model – students must define the whole by circling or boxing the snack pieces. This is NOT six separate wholes.

   fraction $\frac{6}{6}$ weight 1.125 oz or 32 grams

PICTURE



Calibrate and use the balance to help answer the following questions. Divide the snack equally between you and your partner.

2. In relation to the original whole unit, your new portion is represented by:

   fraction $\frac{3}{6}$ or $\frac{1}{2}$ decimal 0.5

   percent 50% weight 0.56 oz or 16 grams **approximate*

3. Do you and your partner each have exactly half of the whole snack? Justify.
   Yes. We compared their weights on the balance and they equaled each other or leveled out.

4. A friend wants to share your portion. By weight, how would you make sure you both have an equal amount? Do so. Estimate half of my portion, then use the balance to make them exactly equal.

5. In relation to the original whole unit, your new portion is represented by:

   fraction $\frac{1}{4}$ decimal 0.25

   percent 25% weight 0.28 oz or 8 grams **approximate*

6. Your partner also had to share their snack with a friend. Write the equation you would use to find the fractional representation of your portion, your friend's portion, and your partner's portion combined.
   Find the total of the three portions. $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$

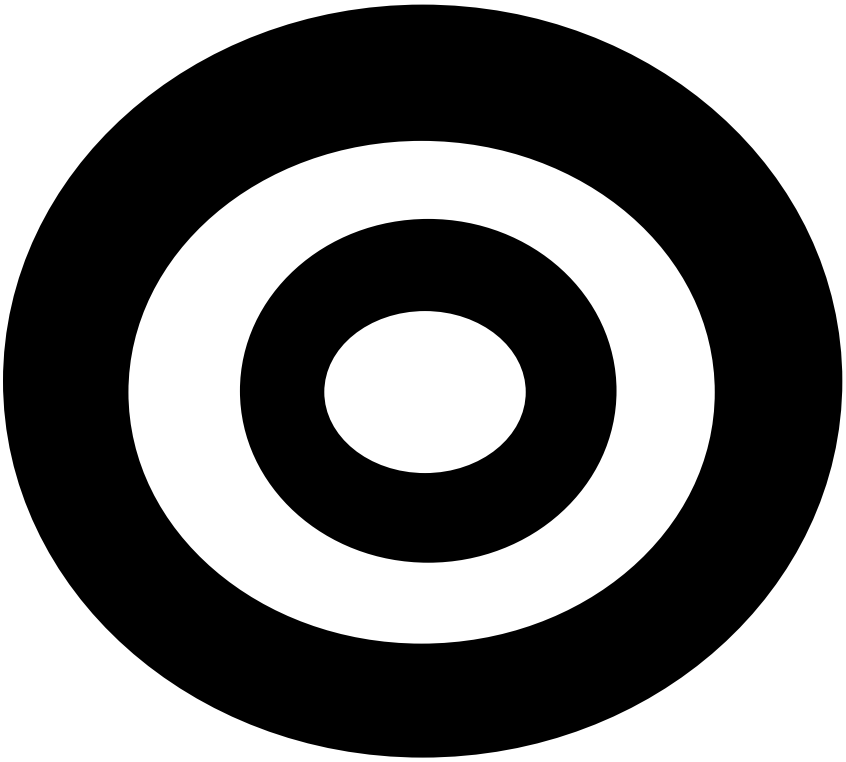
7. Explain how using weight to divide something equally may be more accurate than using the method of quantity (counting pieces). Draw a picture to justify your reasoning. Dividing by quantity only works when all of the pieces are the same size. Portions can have the same weight even if the pieces of the portion are different sizes or quantities are different.

Summer Math

Student Packet/Paquete de alumno

Unit 4

English/Español



Target Number

Units 4 Lesson 3 – FAMILY FUN
One per student for home
One per partner pair in class

*Print on **yellow** paper.*

Family Fun – Problem Cards (1 of 3)

A.
Kayla ate 2.75 slices of pizza at lunch. Carlos ate $3\frac{1}{2}$ slices. Total slices of pizza eaten?

Kayla comió 2.75 porciones de pizza en el almuerzo. Carlos comió $3\frac{1}{2}$ porciones. ¿Cuál es el total de porciones de pizza que se comieron?

B.
My mom's recipe calls for $1\frac{1}{8}$ cups of oats, but a recipe online calls for 1.75 cups. What is the measurement difference between the oats in the recipes?

Para la receta de mi mamá se necesitan $1\frac{1}{8}$ tazas de avena, pero para una receta en línea se necesitan 1.75 tazas. ¿Cuál es la diferencia de medición entre la avena en las recetas?

C.

$$\begin{array}{r} \$405{,}258{,}013.79 \\ +\ \$18{,}036{,}906.35 \\ \hline \end{array}$$

D.

$$9074.018 - 6939.57 = ?$$

E.
Jerry had $38,942.37 in his savings account. After putting a down payment on a new car he had $31,542.37. How much was his down payment?

Jerry tenía $38,942.37 en su cuenta de ahorros. Luego de realizar un pago por un nuevo auto, tenía $31,542.37. ¿De cuánto fue este pago?

F.
A concrete mixture has 37.5% gravel aggregate, 35% sand, 17.5% cement, and water. What percent of the mixture is water?

Una mezcla de concreto tiene un 37.5% de agregado de grava, un 35% de arena, un 17.5% de cemento y agua. ¿Qué porcentaje de la mezcla es el agua?

Units 4 Lesson 3 – FAMILY FUN
One per student for home
One per partner pair in class

*Print on **yellow** paper.*

Family Fun – Problem Cards (2 of 3)

G.
There is a 12.5% hotel tax in Florida. If the room cost was $388.00, how much tax should be charged?

Hay un impuesto de hotel de 12.5% en Florida. Si el costo de la habitación fue de $388.00, ¿cuánto se debe cobrar de impuestos?

H.
A 33% late fee is added to your bill if not paid on time. Dora missed her payment of $99.00. How much is her late fee?

Se agrega una tarifa por atraso del 33% si la factura no se paga a tiempo. Dora no realizó su pago de $99.00. ¿De cuánto es su tarifa por atraso?

I.
Kayla deposited $2500 into a savings account for her son. It will earn 15% interest in one year if untouched. How much will she earn that year?

Kayla depositó $2500 en una cuenta de ahorros para su hijo. Ganará 15% de interés en un año si no se toca. ¿Cuánto ganará en ese año?

J.
Paul's credit card charged him 20% interest each month on purchases. If he charged $198.20, how much interest would be added?

La tarjeta de crédito de Paul le cobró un 20% de interés cada mes sobre sus compras. Si gastó $198.20, ¿cuánto interés se agregará?

K.
Justin left a 25% tip on his food bill of $48.80. How much tip did he leave?

Justin dejó una propina de 25% en su cuenta de restaurante de $48.80. ¿Cuánta propina dejó?

L.
Jill left a $10 tip on a bill that was $40? What percent tip did she leave?

Jill dejó una propina de $10 de una factura que era de $40. ¿Qué porcentaje de propina dejó?

Units 4 Lesson 3 – FAMILY FUN
One per student for home
One per partner pair in class

*Print on **yellow** paper.*

Family Fun – Problem Cards (3 of 3)

M. Determine if this statement is true.
Determina si esta afirmación es correcta.

$$\frac{9 \text{ green}}{10 \text{ blue}} = \frac{18 \text{ blue}}{20 \text{ green}}$$

N. Determine if this statement is true.
Determina si esta afirmación es correcta.

$$\frac{\$5}{3 \text{ bags}} = \frac{\$30}{18 \text{ bags}}$$

O. Based on the ratio given, determine how many students fit on one bus.

En base a la relación dada, determina cuántos estudiantes caben en un autobús.

480 students : 8 buses

P.
Eiko hit 20 notes out of 22 on her sheet music. At this rate, how many notes will she hit out of 33?

Eiko tocó 20 notas de las 22 de su hoja de música. A este ritmo, ¿cuántas notas tocará de 33?

Q.

$$\frac{3}{4} + \frac{4}{6} = ???$$

R.

$$15\frac{7}{8} - 11\frac{3}{4} = ???$$

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:

_____

_____

_____

_____

Unit 4 Lesson 2 – Snack Fractions
One per student

100-Calorie Snack Packs – Snack Fractions

Open both snack packs and combine contents. Keep the package for weight information.

1. Draw a pictorial representation of the whole in the space provided. PICTURE

   fraction _____ weight _____

Calibrate and use the balance to help answer the following questions. Divide the snack equally between you and your partner.

2. In relation to the original whole unit, your new portion is represented by:

   fraction _____ decimal _____

   percent _____ weight _____ **approximate*

3. Do you and your partner each have exactly half of the whole snack? Justify.

4. A friend wants to share your portion. By weight, how would you make sure you both have an equal amount? Do so.

5. In relation to the original whole unit, your new portion is represented by:

   fraction _____ decimal _____

   percent _____ weight _____ **approximate*

6. Your partner also had to share their snack with a friend. Write the equation you would use to find the fractional representation of your portion, your friend's portion, and your partner's portion combined. Find the total of the three portions.

7. Explain how using weight to divide something equally may be more accurate than using the method of quantity (counting pieces). Draw a picture to justify your reasoning.

Unit 4 Lesson 2 – Snack Fractions
One per student

100-Calorie Snack Packs – Snack Fractions

Abre ambos paquetes de refrigerios y combina los contenidos. Guarda el paquete para la información del peso.

1. Haz una representación gráfica del entero en el espacio provisto.

   fracción _____ peso _____

Calibra y usa la balanza para ayudarte a responder las siguientes preguntas. Divide los refrigerios de manera equitativa entre tú y tu compañero.

2. En relación con la unidad entera original, tu nueva porción está representada por:

   fracción _____ decimal _____

   porcentaje _____ peso _____ **aproximado*

8. ¿Tú y tu compañero tienen cada uno exactamente la mitad del refrigerio total? Justifica tu respuesta.

9. Un amigo quiere que compartas con él tu porción. Por peso, ¿cómo te asegurarías de que ambos tengan una cantidad igual? Hazlo así.

10. En relación con la unidad entera original, tu nueva porción está representada por:

    fracción _____ decimal _____

    porcentaje _____ peso _____ **aproximado*

11. Además, tu compañero tenía que compartir su refrigerio con un amigo. Escribe la ecuación que usarías para encontrar la representación fraccional de tu porción, la porción de tu amigo y la porción de tu compañero combinada. Encuentra el total de las tres porciones.

12. Explica cómo usar el peso para dividir algo en partes iguales puede ser más preciso que usar el método de cantidad (contando piezas). Haz un dibujo para justificar tu razonamiento.

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

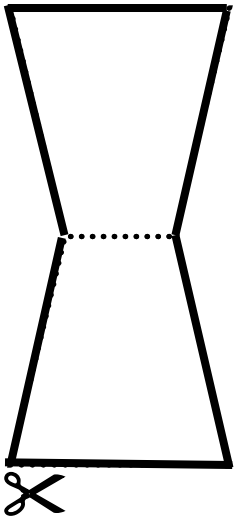
Cómo se juega

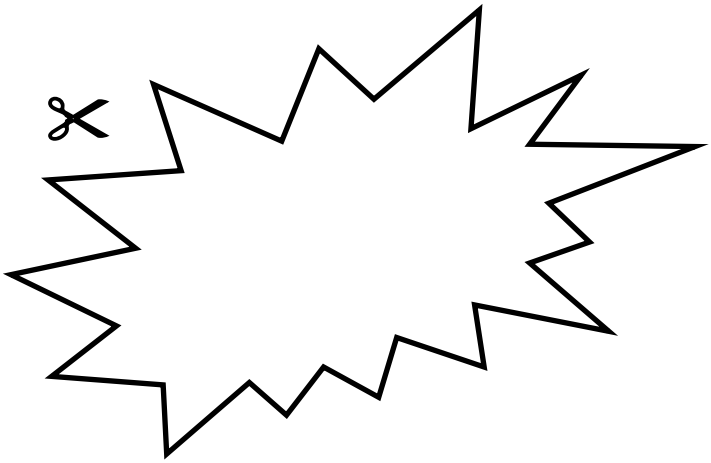
1. Empiece en una de las esquinas. Puede haber más de 1 jugador en cada figura de inicio.
2. Cuando sea su turno, saque una de las tarjetas de juego de su nivel y resuelva el problema.
3. Uno de los otros jugadores usa la clave de respuestas para ver si su respuesta es correcta. Si es correcta, tira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

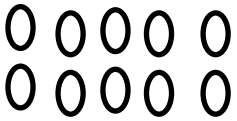
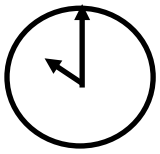
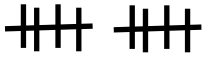
Educator Packet

Unit 5

Warm up: Target Number

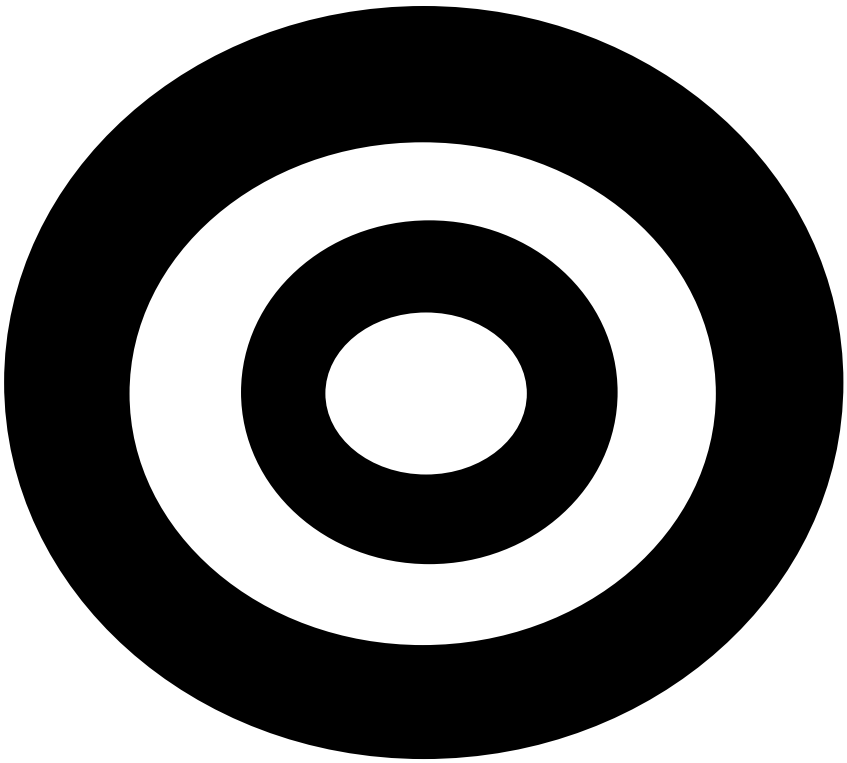
- The task is to represent the target number in different ways in one minute. Do a couple samples with students before starting the timer.
    a. Start all groups with the numbers 12 and 15.
        i. All target numbers are fair to use with students in grades 1 through 8.
        ii. Use numbers 20 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

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***
Grade 5	Multi digit multiplication	***Procedural Fluency***
Grade 6	Multi digit division; multi digit decimal operations	***Procedural Fluency***
Grade 7	Solve two step equations in the form of px + q = r and p(x +q) = r	***Procedural Fluency***
Grade 8	Solve simple 2 x 2 systems of equations by inspection/substitution	***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.

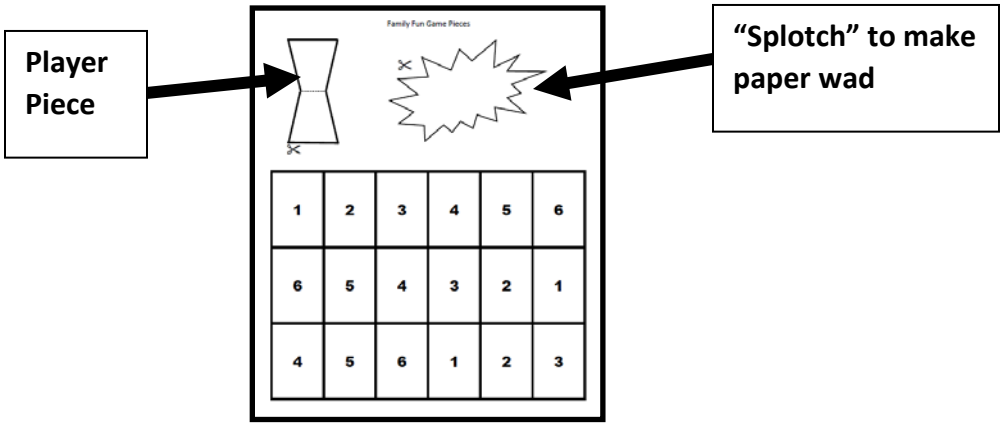
Process:

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.

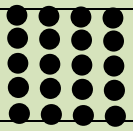
Do It Yourself (DIY) Game Pieces

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, 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		$\frac{7}{2}$ $\frac{}{15}$	96

CGI CHARTS:

While the New York State's Next Generations Learning Standards for Grade 5 and Grade 6 do not have a chart of sample word problems, the CGI Chart for Grades 5 and 6 give the students practice multiplying with fractions and decimals. Additionally, the CGI process supports students in reading and solving word problems.

Process:

1. ***Pick one word problem.*** Spend time on the process instead of a quick answer.
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?

	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 child has 20 baby teeth. If there are 17 children in the class that still have all their baby teeth, how many baby teeth would that be?	A lot of teeth have been lost by children in this school. A total of 147 teeth have been lost. If each child averaged a loss of 7 teeth, how many children are in this school?	Most fifth and sixth graders have many permanent teeth. There are 14 students in the fifth grade. If they have a total of 108 permanent teeth, what is the average number of permanent teeth per student?
Rate	Kiki worked at a hot dog stand. She could sell 45 hot dogs in 30 minutes. How many hot dogs could she sell in 3-1/2 hours?	If Kiki sold 18 hot dogs per hour, how many hours would it take her to sell 627 hot dogs?	If Kiki sold 587 hot dogs over a period of 12 hours, how many sold hot dogs did she average per hour?
Price	The price of a package of hot dogs is $2.97. How much will Kiki spend on 3 dozen packages?	Kiki spent $45.36 on hot dog buns. If each package costs $1.08, how many packages did she buy?	Kiki spent $119.60 on hot dogs. She bought 520 hot dogs. How much did she spend per hot dog?
Multiplicative Comparison	Kiki uses 6 times more mustard than catsup on the hot dogs she sells. She uses 48 ounces of catsup a week. How many ounces of mustard does she use?	In a week, Kiki uses 50 pounds of potatoes. She uses 2.5 pounds of catsup. How many times more potatoes than catsup does she use?	Kiki used 125 pounds of onions in a two week period. That's 1-1/2 times more onions than potatoes. How many potatoes did she use?
Fractions	Kiki puts $\frac{1}{4}$ cup of chopped onions on each hot dog. If she sells 29 hotdogs, how many cups of chopped onions will she need?	An onion yields 2/3 cup when chopped. If Kiki had 7-1/3 cups of chopped onions, how many onions did she chop?	Kiki chopped 12-1/3 cups of onions. She used the onions on 61 hot dogs. How many cups of onions did she use on each hot dog?

CGI Problems for *A Foot in the Mouth* Unit 5

	Multiplicación	División de medidas	División partitiva
Formación de grupos y Partición	Un niño tiene 20 dientes de leche. Si hay 17 niños en la clase que todavía tienen sus dientes de leche, ¿cuántos dientes de leche serían en total?	Muchos niños han perdido gran cantidad de dientes en esta escuela. En total se han perdido 147 dientes. Si en promedio cada niño perdió 7 dientes, ¿cuántos niños hay en esta escuela?	La mayoría de los de quinto y sexto grado tienen muchos dientes definitivos. Hay 14 estudiantes en el quinto grado. Si en total tienen 108 dientes definitivos, ¿cuál es el número promedio de dientes definitivos por estudiante?
Velocidad	Kiki trabajaba en un puesto de salchichas. Podía vender 45 salchichas en 30 minutos. ¿Cuántas salchichas podría vender en 3-1/2 horas?	Si Kiki vendió 18 salchichas por hora, ¿cuántas horas se demoraría en vender 627 salchichas?	Si Kiki vendió 587 salchichas en un período de 12 horas, ¿cuántas salchichas vendió en promedio por hora?
Precio	El precio de un paquete de salchichas es $2.97. ¿Cuánto va a gastar Kiki en 3 docenas de paquetes?	Kiki gastó $45.36 en panes para salchichas. Si cada paquete cuesta $1.08, ¿cuántos paquetes compró?	Kiki gastó $119.60 en salchichas. Compró 520 salchichas. ¿Cuánto gastó por salchicha?
Comparación multiplicativa	Kiki usa 6 veces más mostaza que ketchup en las salchichas que vende. Usa 48 onzas de ketchup a la semana. ¿Cuántas onzas de mostaza usa?	En una semana, Kiki usa 50 libras de papas. Usa 2.5 libras de ketchup. ¿Cuántas veces más papas que ketchup usa?	Kiki usó 125 libras de cebolla en un período de dos semanas. Eso es 1-1/2 veces más cebollas que papas. ¿Cuántas papas usó?
Fracciones	Kiki pone $\frac{1}{4}$ taza de cebolla picada en cada salchicha. Si vende 29 salchichas, ¿cuántas tazas de cebolla picada necesitará?	Una cebolla rinde 2/3 de taza al ser picada. Si Kiki tenía 7-1/3 tazas de cebollas picadas, ¿cuántas cebollas picó?	Kiki picó 12-1/3 tazas de cebolla. Usó las cebollas en 61 salchichas. ¿Cuántas tazas de cebollas usó en cada salchicha?

Materials
- 4 graham crackers (1 sheet)
- 2 TBS Nutella
  Allergy Warning – please substitute a different spread for the entire class if nut allergies are present.
- 3 large strawberries
- 2 paper dessert plates
- 2 paper towels
- 2 plastic knives

All items listed above per partner pair
- **BLM** Crackers and Nutella-Snack Fractions
- **BLM** Crackers and Nutella-Snack Fractions Teacher Guide

Math Vocabulary
unlike denominators
like denominators
unit price
ratio
proportion
percent
greatest common factor
least common multiple

Literature Vocabulary
theme
point of view
influence
confident
revolution

Teacher Note
Pay particular attention to how students deal with the different fractions that emerge from dividing the Nutella. The pictorial model shows halves and fourths; however the VALUE of those fractional pieces are also fractions. For instance: Students receive one-fourth of the Nutella when divided by 4 people. Each one-fourth portion has a value of (or is equal to) half a TBS. This is purposeful and should be a key point of discussion.

Unit 5, Lesson 2 — Grades 5-6

Snack Fractions

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

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions, decimals, ratios, and percents.
- Convert between fractions, decimals, and percents.
- Estimate to find solutions to problems involving fractions, decimals, and percents.

Language Objectives
- Discuss how fractions, decimals, ratios, and percents can be used to solve real-world problems.

Snack Fractions
The Snack Fraction activities for this unit will focus on combining and separating fractional parts as well as dividing into fourths. Students will not divide the cracker during this activity. The Focus is on area and set models in a non-rectangular format. A Teacher Guide for the BLM is provided.

Two TBS of Nutella represents one whole. Three strawberries represent one whole.

QUESTIONS
- What is the whole in this situation?
- How do I break this up into equal shares?
- What does that fraction represent?
- Does this fraction have an easily calculated decimal equivalent?
- How can you find the decimal of this fraction?
- How did you calculate the percent?

Once the activity is complete, let them enjoy their snack!

Snack Fraction Journal Writing: BLM Crackers and Nutella-Snack Fractions

- Describe any challenges you had during today's activity and how you were able to solve the problem.

Objectives
Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 5 Lesson 2 – Snack Fractions
1 per student

Strawberries and Nutella – Snack Fractions KEY

Work together to solve the problems and fill in the chart below.

	Divide snack equally between 2 people		
	Your fractional portion of the whole?	**Value of your portion?**	**How did you divide the snack?**
Nutella 2 TBS = 1 whole	$\frac{1}{2}$	How much Nutella would you receive? 1 TBS	
strawberries 3 strawberries = 1 whole	$\frac{1}{2}$	How many strawberries would you receive? $1\frac{1}{2}$ strawberries	answers will vary but may include: a) each berry divided in half b) 2 whole strawberries and 1 divided in half

	Divide snack equally between 4 people		
	Your fractional portion of the whole?	**Value of your portion?**	**How did you divide the snack?**
Nutella 2 TBS = 1 whole	$\frac{1}{4}$	How much Nutella would you receive? $\frac{1}{2}$ TBS	
strawberries 3 strawberries = 1 whole	$\frac{1}{4}$	How many strawberries would you receive? $\frac{3}{4}$ of 1 strawberry	answers will vary but may include: a) each strawberry divided into fourths b) 2 strawberries divided in half, 1 strawberry divided into fourths

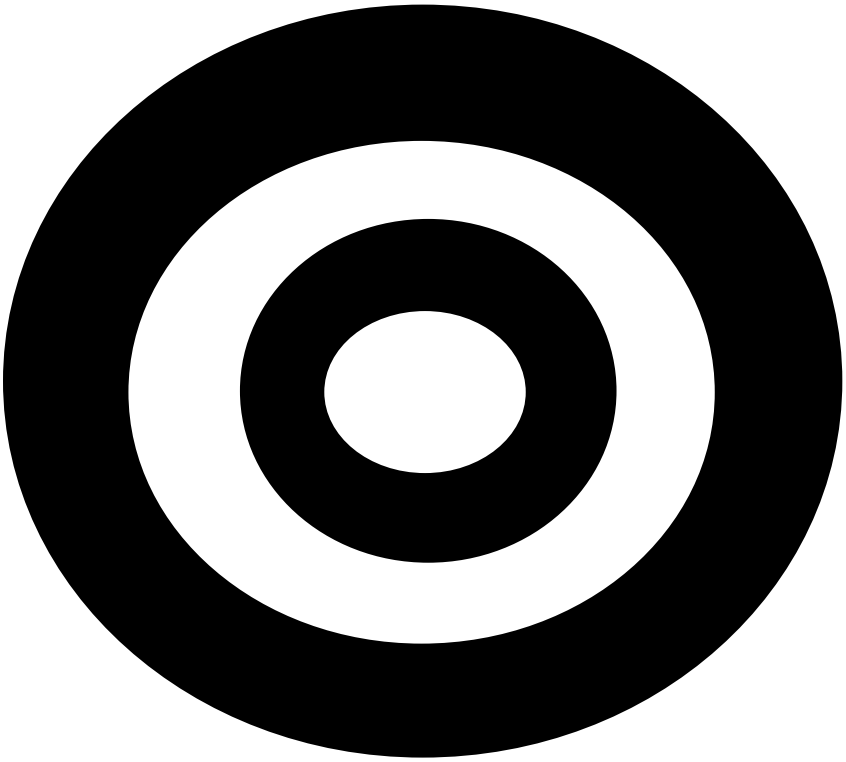
*Why is it possible for the *fractional portion of the whole* to differ from the *value of your portion*? The value takes the unit of measure into consideration and describes the quantity of the fractional portion of the whole.

Summer Math

Student Packet/Paquete de alumno

Unit 5

English/Español



Target Number

Units 5 Lesson 3 – FAMILY FUN
One per student for home
One per partner pair in class

*Print on **yellow** paper.*

Family Fun – Problem Cards (1 of 3)

A.

$$18\ \frac{3}{7} + 6\ \frac{4}{7} - 24.5 = ?$$

B.

Marla ran 4.75 miles. Jesse walked $3\ \frac{3}{8}$ miles farther than Marla. How far did Jesse walk?

Marla corrió 4.75 millas. Jesse caminó $3\ \frac{3}{8}$ millas más que Marla. ¿Cuánto caminó Jesse?

C.

$$\begin{array}{r} \$5000.00 \\ -\ 4999.99 \\ \hline \end{array}$$

D.

$$\begin{array}{r} 111{,}111{,}111 \\ +\ 999{,}999{,}999 \\ \hline \end{array}$$

E.

27.6 grams salt added to bottle G. 18.05 grams of salt added to bottle H. 9.007 grams of salt added to bottle J. How much salt was used altogether?

27.6 gramos de sal agregados a la botella G. 18.05 gramos de sal agregados a la botella H. 9.007 gramos de sal agregados a la botella J. ¿Cuánta sal se usó en total?

F.

A solution is made up of 18.06% -chemical A, 70.02%-distilled water, and the remaining percentage is chemical B. What percent is chemical B?

Una solución está hecha de 18.06% de sustancia química A, 70.02% de agua destilada y el porcentaje restante es de sustancia química B. ¿Qué porcentaje corresponde a la sustancia química B?

Units 5 Lesson 3 – FAMILY FUN
One per student for home
One per partner pair in class

*Print on **yellow** paper.*

Family Fun – Problem Cards (2 of 3)

G.

There is a 15% hotel tax in Oregon. If the room cost was $183.00, how much tax should be charged?

Hay un impuesto de hotel de 15% en Oregon. Si el costo de la habitación fue de $183.00, ¿cuánto se debe cobrar de impuestos?

H.

70% tip of $500 = ?

propina del 70% de $500 = ?

I.

Delia deposited $600 into a savings account for her son. It will earn 15% interest in one year if untouched. How much will she earn that year?

Delia depositó $600 en una cuenta de ahorros para su hijo. Ganará 15% de interés en un año si no se toca. ¿Cuánto ganará en ese año?

J.

Tiffany's credit card charged her 20% interest each month on purchases. If she paid $46.00 in interest, how much did she charge on the card that month?

La tarjeta de crédito de Tiffany le cobró un 20% de interés cada mes sobre sus compras. Si pagó $46.00 de intereses, ¿cuánto gastó con la tarjeta ese mes?

K.

12 cups of granola consists of about 25% cashews. How many cups of cashews are in the granola mixture?

12 tazas de granola consisten aproximadamente en 25% de anacardos. ¿Cuántas tazas de anacardos hay en la mezcla de granola?

L.

Julie left a $12.50 tip on a bill that was $125.00? What percent tip did she leave?

Julie dejó una propina de $12.50 de un factura que era de $125.00. ¿Qué porcentaje de propina dejó?

Units 5 Lesson 3 – FAMILY FUN
One per student for home
One per partner pair in class

*Print on **yellow** paper.*

Family Fun – Problem Cards (3 of 3)

M. Determine if this statement is true.

$$\frac{9 \text{ green}}{10 \text{ blue}} = \frac{45 \text{ green}}{40 \text{ blue}}$$

Determina si esta afirmación es correcta.

$$\frac{9 \text{ green}}{10 \text{ blue}} = \frac{45 \text{ green}}{40 \text{ blue}}$$

N. Determine if this statement is true.

$$\frac{24 \text{ lbs}}{\$8} = \frac{6 \text{ lbs}}{\$2}$$

Determina si esta afirmación es correcta.

$$\frac{24 \text{ lbs}}{\$8} = \frac{6 \text{ lbs}}{\$2}$$

O. Based on the ratio given, determine how many cotton balls fit in one bag.

9600 cotton balls: 8 bags

En base a la relación dada, determina cuántas bolitas de algodón caben en una bolsa.

9600 bolitas de algodón: 8 bolsas

P.
Nurse Farrah delivers about 6 babies per shift at the hospital. At this rate, how many babies will she deliver in 8 shifts?

La enfermera Farrah asiste en el parto de 6 bebés por turno en el hospital. A este ritmo, ¿cuántos partos atenderá en 8 turnos?

Q.

$$\frac{9}{12} + \frac{1}{4} = ???$$

R.

$$3\frac{2}{3} - 1\frac{1}{5} = ???$$

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:

_____

_____

_____

_____

Unit 5 Lesson 2 – Snack Fractions
1 per student

Strawberries and Nutella – Snack Fractions

Work together to solve the problems and fill in the chart below.

	Divide snack equally between 2 people		
	Your fractional portion of the whole?	**Value of your portion?**	**How did you divide the snack?**
Nutella 2 TBS = 1 whole		How much Nutella would you receive? _____ TBS	
strawberries 3 strawberries = 1 whole		How many strawberries would you receive? _____ strawberries	

	Divide snack equally between 4 people		
	Your fractional portion of the whole?	**Value of your portion?**	**How did you divide the snack?**
Nutella 2 TBS = 1 whole		How much Nutella would you receive? _____ TBS	
strawberries 3 strawberries = 1 whole		How many strawberries would you receive? _____ strawberries	

*Why is it possible for the *fractional portion of the whole* to differ from the *value of your portion*?

Unit 5 Lesson 2 – Snack Fractions
1 per student

Strawberries and Nutella – Snack Fractions

Work together to solve the problems and fill in the chart below.

	Divide el refrigerio igualmente entre 2 personas		
	¿Tu porción fraccional del entero?	**¿Valor de tu porción?**	**¿Cómo dividiste el refrigerio?**
Nutella 2 TBS = 1 entero		¿Cuánto Nutella recibirías? _____ TBS	
fresas 3 fresas = 1 entero		¿Cuántas fresas recibirías? _____ fresas	

	Divide el refrigerio igualmente entre 4 personas		
	¿Tu porción fraccional del entero?	**¿Valor de tu porción?**	**¿Cómo dividiste el refrigerio?**
Nutella 2 TBS = 1 entero		¿Cuánto Nutella recibirías? _____ TBS	
fresas 3 fresas = 1 entero		¿Cuántas fresas recibirías? _____ fresas	

*Como es posible que *la porción fraccional* sea diferente del *valor de tu porción*?

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

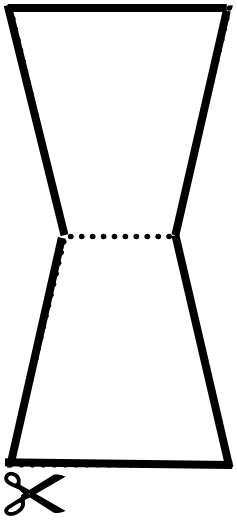
Cómo se juega

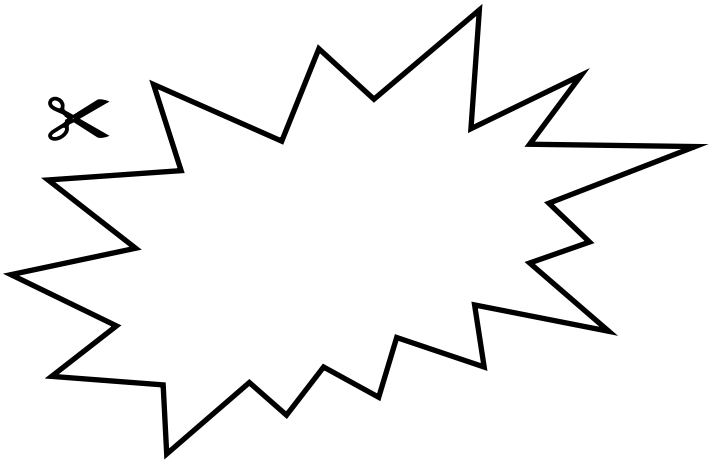
1. Empiece en una de las esquinas. Puede haber más de 1 jugador en cada figura de inicio.
2. Cuando sea su turno, saque una de las tarjetas de juego de su nivel y resuelva el problema.
3. Uno de los otros jugadores usa la clave de respuestas para ver si su respuesta es correcta. Si es correcta, tira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

Math Vocabulary
array model
area model
factors
products
multiples
prime factors
greatest common factor
least common multiple

ELPS (*English Language Proficiency Standards*)
2A, 2F, 2I, 3C, 3E, 3H, 4C, 5D, 5F, 5G

CCRS *(College and Career Readiness Standards)*
I – BC
IV – C1
VIII – A1, S2, A3, A4, A5, B1, B2, C1, C2, C3
IX – A1, A2, A3, B1, B2, C1, C2, C3
X – B1

Transition to Math

Let's take a look at our Measurement Lab assignment for today. There were two strategies for you to use to solve those problems: one was to think in terms of area; the other was to use an array. And of course, we had the key to determine the final answer.

But for now, let's just look at the grid picture. How did you solve this problem? *(Responses – could be they counted the squares showing underneath the shaded area; or that they used multiplication.)*

Without thinking about the key, what is the area of the rectangle superimposed over the grid? (*48 square units – be sure they say square units)* Yes, they are SQUARE UNITS. We measure areas in those little squares, and the unit of measure is a square unit. In the case of the problem you solved, we solve for SQUARE MILES. What does that mean? *(Square Mile is a square that is one mile long and one mile wide—like a tile of the floor only MILE long in every direction rather than just a foot.)*

But let's go back to thinking about the visual measurement of that shaded rectangle. You said 48 square units. Some of you probably counted the squares, which is a valid way of finding the area for this problem. Some of you multiplied. What did you multiply? *(response)* We multiplied 8 x 6. And we found those numbers by counting the SIDES of the squares. (*Point to the rectangle's 8 unit side*.) There are 8 units that make up this side. This is a straight line measurement. This number, 8, is one of the FACTORS that we use to find the PRODUCT of 48. (*Write on a board or chart paper.)*

There is only one other number that you can use to multiply 8 by to get 48. What is it? *(six)* Look at the area model. The other side of the model is SIX units long *(count them)*. SIX is the other FACTOR. *(Write on a board or chart paper.)*

And 48 is the PRODUCT of 8 and 6. 48 is also A MULTIPLE of 8, and A MULTIPLE of 6. Are there other multiples of 8? *(response)* Sure, any number that you say when you skip count by 8 is a multiple of 8 – 8 then is one of the FACTORS of the multiple. (*Write the multiples of 8 through ten times, or 80.)*

And what about 6 – are there other MULTIPLES of six? Of course, any number that you say when you skip count by SIX is a multiple of 6. *(Write the multiples of 6 through 10 times or 60.)*

Let's try a few more area model multiplication before our TV Lesson.

Unit 2, Lesson 1 — Grades 5-6
Transition to Math - continued

(Work through the BLM-TM Factors, Products, Multiples with the students using this process:

1. **Make the rectangle described on grid paper,** *always using the first dimension as the width and the second dimension as the length – we are developing an understanding of matrix, which is a definite location of the rectangle, and is always noted as rows times columns.*
2. **Label the side measures, find the area, then write the number sentence which describes this particular dimension/area relationship (example 2 x 9 = 18).**
3. **Develop the number sentence on the table at the bottom** *using factor (width) times factors (length) to find the product (area).*
4. **Find multiples of the first factor** *beginning with the factor and ending with 10 times the factor. A hundreds chart is provided if students have a difficult time skip counting by some of the factors. Simply have students find the factor and color with a light colored crayon, then add the factor and color that multiple and so forth until they have colored in 10 multiples.*

(Complete these three columns before the TV Lesson.)

QUESTIONS *are to the left.*

Objectives

Read through the math and language objectives, making sure that students understand how they accomplished each.

QUESTIONS:

Step 1

- Name the rectangle we've drawn *(first example is a 2 units by 9 units rectangle).*

Step 2

- What are the side measurements *(start with width, or rows; then length, or number of columns)*?
- What number sentence describes the relationship of the measures of these sides to the area?

Step 3 – *refer to the bottom table*

- If we think of these as factors and a product, what is our number sentence that represents that relationship? *(Same as the one inside the rectangle.)*

Step 4

- If we skip count by our first factor (*width*) what are the multiples of that factor beginning with the factor itself and skip counting through 10 times that factor *(first multiple which is the first factor)*?
- If we skip count by our second factor, what are the multiples of that factor beginning with the factor itself and skip counting through 10 times that factor?

💻 **Technology**:

Factors and Multiples

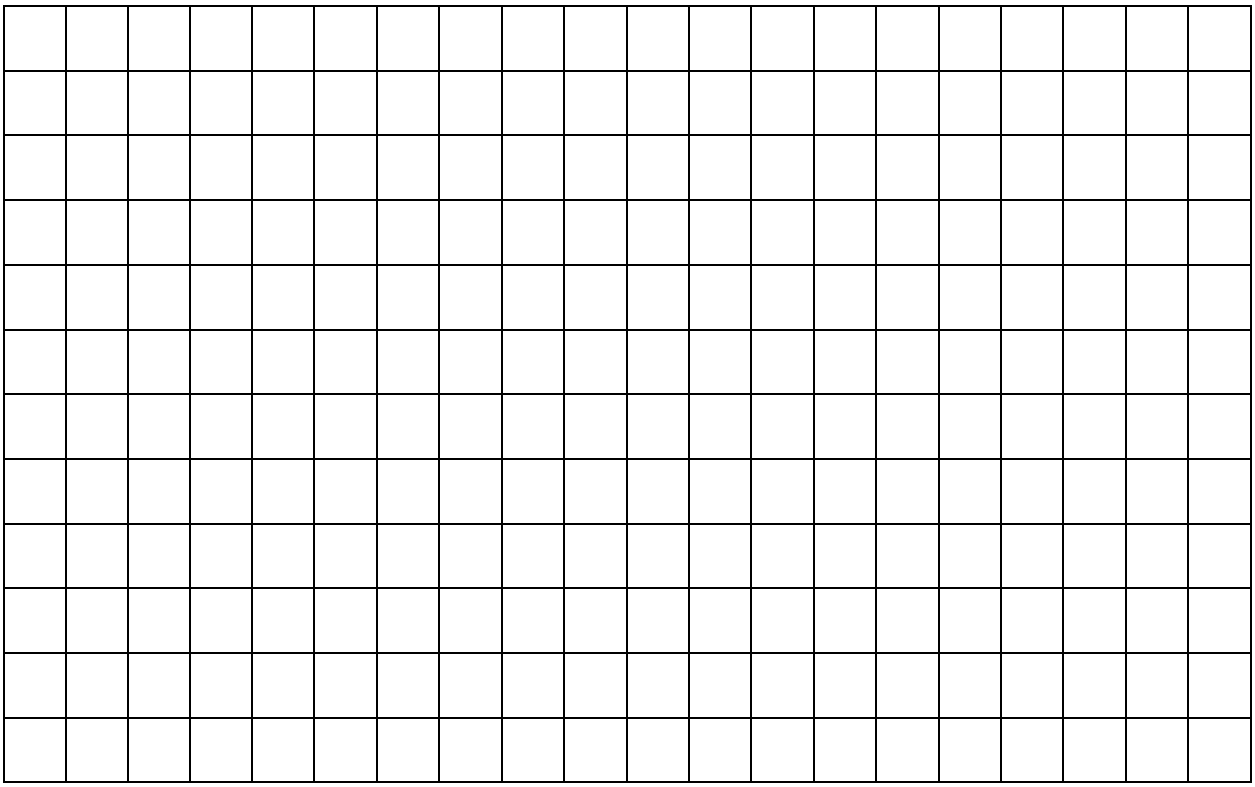
http://www.bbc.co.uk/bitesize/ks2/maths/number/factors_multiples/play/ Very British! Make sure your class can handle the British, then practice "throwing" the multiples in the second activity before working with the students.

http://interactivemaths.net/index.php?q=category/1/28/29/106 An entire page of links for many factor/multiple practice games/activities.

Unit 2 Lesson 1 – Transition to Math
One per student

Factors – Products – Multiples

1cm Graph Paper



Dimensions	Factor x Factor = Product	Other Multiples of the First Factor (through 10 times)	Other Multiples of the Second Factor (through 10 times)	Least Common Multiple or LCM
2cm by 9cm		2,	9,	
3cm by 8cm		3,	8,	
4cm by 7cm		4,	7,	
5cm by 6cm		5,	6	

Unit 2 Lesson 1 – Transition to Math
One per student

Hundreds Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Materials

- Two pieces of construction paper, 1" x 9" one each of red and yellow -- one each per student
- Scissors -- one per student
- **BLM TM** – The Crow and the Pitcher – TV Teacher needs one; students should have the one they completed in TM lesson.
- **BLM** – The Crow and the Pitcher Revisited – one per student

Math Vocabulary
unlike denominators
like denominators
unit price
ratio
proportion"
percent
greatest common factor
least common multiple

Literature Vocabulary
moral
trait
patient
impatient
greedy
generous
adventurous
cautious

ELPS (*English Language Proficiency Standards*)
2C, 2E, 3B, 3C, 3E, 4C, 4D, 4F, 5A, 5B

CCRS *(College and Career Readiness Standards)*
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VIII – A1, A2, A3, A4, A5, B1, B2, C1, C2, C3
IX – A1, A2, A3, B1, B2, C1, C2, C3
X – B1

Unit 4, Lesson 1 — Grades 5-6

TV Lesson

Math Objectives:

- Add and subtract positive rational numbers fluently.

Language Objectives:

- Discuss problem solving strategies with peers.
- Write out solutions for solving problems.
- Justify their thinking and strategies.

Building Background
The crow was very smart. She learned from past experiences and from observation. We're going to use a few of your past experiences today and your observations skills to help us understand adding and subtracting fractions with Unlike denominators.

Let's look back at the BLM you used during your Transition to Math lesson (*Show the **BLM-TM** The Crow and the Pitcher).*

First, observe the pictures of the pitchers. What do you notice about the increments on the pitchers for the two problems? *(pause)* You might have observed several things, but I hope that you noticed that in problem one, both of the pitchers were marked in fourths. In problem two, both of the pitchers were marked in tenths. This is very important.

We cannot add or subtract fractions unless their denominators are the same. Why is that so, do you think? Discuss quickly in your class. *(pause)*

To answer that, let's look at a few models.
Take a look at these pieces of construction paper. What do you observe about these pieces of construction paper? *(pause)*
Yes, there are two different colors.
And they are both the same size strip. Work with me, please.

Comprehensible Input
Now, I'm going to divide these pieces into fractional parts.
The red piece, I'll divide into fourths. (*Do so by folding into half, then folding the half into half, opening to see the four equal pieces, and cutting apart).* Now, I have 1/4 and 1/4 and 1/4 and 1/4. What do you notice about all of the denominators? (*They are the same -- four equal pieces, fourths.)*

I'd like each of you to write two addition sentences and two subtraction sentences using fourths. *(generous pause)*

Here are a few I made: 1/4 + 1/4 = 2/4; 3/4 + 1/4 = 4/4; 3/4 – 1/4 = 2/4; 2/4 – 1/4 = 1/4 .

There are many addition and subtraction sentences with fourths -- but what do they all have in common? (*They are combinations and separations of fourths*.) I know that when I add or subtract, I will end up with fourths because I started out with fourths -- both fractions had fourths in common.

OK, let's take the yellow strip of paper. I'm going to cut that into eighths. (*Do so in the same fashion as you did the fourths, by folding in half each time, then cutting apart*.)

I have eight equal pieces, and I could add and subtract eighths just like I did the fourths. And every time I add or subtract eighths together, I know I'm going to get an answer in eighths because I started out with eighths -- both fractions had eighths in common.

- But what happens if I want to add 1/4 and 1/8? (*Lay down red and yellow piece.*)
- How do I do that?
- What will I end up with?
- What is 1/4 and 1/8? *(Pause for discussion.)*
- Is it as easy to add and subtract as our previous problems?
- What is different from our other examples? *(pause)*

We don't have a common denominator. We can put these two pieces down together, but we don't have a common name to call them.

Ah, but in comes the mathematician to the rescue. The mathematician looks at the pieces, and thinks, "I can find a common denominator and use equivalent fractions so I can add or subtract fourths and eighths."

I'll show you. Please follow along with me with your strips of paper.

If we're going to get these denominators the same, then I have to see a physical relationship between the fourths and the eighths.

See if you can find a relationship. *(Pause for them to work.)*

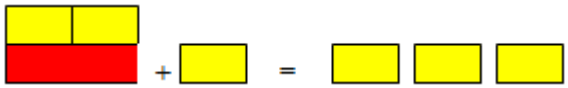
There are many relationships. A simple one to see is that two of my yellow pieces equals one of my red pieces. (*Compare two yellow to one red.)*

How would you describe with a number sentence what we just modeled? *(pause)* 1/8 + 1/8 = 1/4. Check that out with your pieces. Do you agree? *(pause)*

So now I know that 1/4 = 2/8. I have an *equivalent fraction* that I can add to 1/8. What is 2/8 + 1/8? *(pause)* 3/8

Let's prove it again another way.

(*Line up your pieces like this; red + yellow =. Then talk through the exchanging two yellow pieces for the red, and show that all equals three yellows.)*



We can't add or subtract fractions unless we are talking about the same sized pieces. Thank goodness there are ways to find equivalent fractions.

You remember we were finding equivalent ratios; well, we'll find equivalent fractions the same way.

Let's take our $\frac{1}{4}$ $\frac{1}{8}$

We've talked about finding the LCM, the Least Common Multiple. That's the smallest number that both denominators act as a factor for. Look at our two fractions. What do you think the LCM is? *(pause)*

Sure, it's 8. Both 4 and 8 are factors of 8. This one is easy because one of the fractions is already eighths.

$$\frac{2 \times 1 = 2}{2 \times 4 = 8}$$

So what factor do we multiply the denominator 4 by to get 8? *(pause)* 2. And if we multiply the denominator, we have to multiply the numerator by the same number. Why? *(pause)* Because we need to multiply by a form of ONE. 2/2 is ONE.

Now we have our equivalent fraction. 1/4 = 2/8. And I can add the 2/8 to the 1/8. *(Do so.)*

Now you are very wise crows who have observed and found patterns and will now use what you have observed and formulated into a strategy to solve problems.

Let's take a look at the **BLM** The Crow and the Pitcher Revisited.

First, what do you observe that is different about these problems than your Transition to Math problems?

- No models
- Unlike denominators
- More problems

And as you read you'll find another difference.

Let's read #1 together. *(Do so.)*

- What is the math movie you see in your mind when you read this problem? *(Crow drinking; water level dropping.)*
- What fractions are involved and what do they stand for? 7/10 and 1/2
- Talk to your elbow partner about possible strategies for solving this problem. *(generous pause)*
- First of all, this is a subtraction problem.
- What do you know?
    - The water level was up to 7/10. *(Write the 7/10.)*
    - The water level ended up at the 1/2 level. *(Write 1/2 as the answer.)*
    - What we don't know is the change the crow made. We don't know how much she drank or took away from the pitcher. That is our variable.

$$\frac{7}{10} - x = \frac{1}{2}$$

- What do you notice about our equation? *(unlike denominators)*
- Let's get those the same. What is the smallest multiple that 10 and 2 have in common, the Least Common Multiple? *(pause) 10*
- The only fraction we have to change is 1/2. If 2 is one factor of ten, what is the other factor? *5*
- 1/2 x 5/5 = 5/10. 5/10 is equivalent to half.

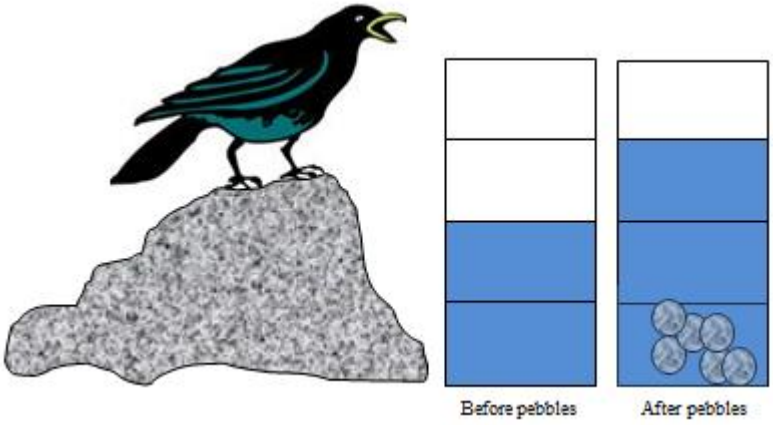
$$\frac{7}{10} - x = \frac{5}{10}$$

	Unit 4, Lesson 1 **Grades 5-6** **TV Lesson** - continued --- So 7/10 subtract some tenth is 5/10. Can you look at that and tell what *x* is? Talk about it in class. Justify your answers. *(pause)* I know that fractions are just like whole numbers. There are fact families to help me reason out an answer. 7 subtract 2 is 5. So, 7- tenths (*Use the word "tenths" as a label on the Smart board)* subtract 2-tenths = 5-tenths. What does 2/10 represent? *(pause)* 2/10 solve the problem of finding the fraction that describes the water the crow drank. OK, now it is your turn. In your Follow-up Lesson, you and your partner will solve the other problems on the BLM. Talk about your strategies in class. **Pirate's Corner** What are some of the math skills you have learned so far this summer that you either didn't know before or that you were not comfortable with before? **Objectives** Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 4 Lesson 1 – Transition to Math
One per group

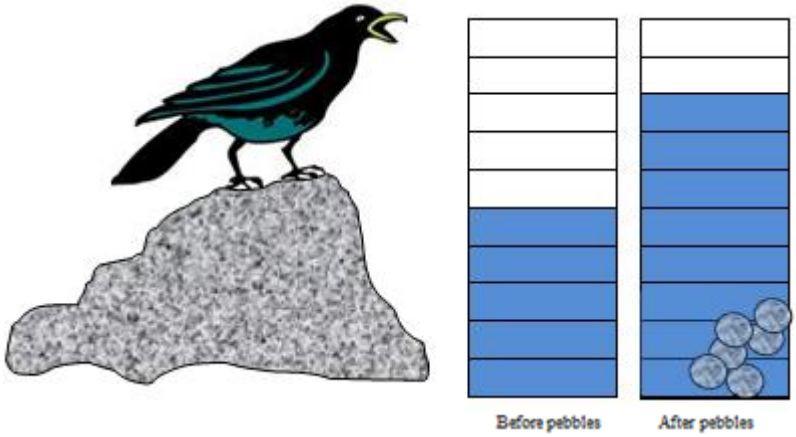
The Crow and the Pitcher

The thirsty crow dropped pebbles into the pitcher and raised the water level so she could drink. This pitcher is divided into fourths, marking the distance to the top of the pitcher in equal increments. The amount of water in the pitcher remained the same, but the level of the water rose.



Write a fraction number sentence that describes what happened in this story.

This pitcher is divided into _____, marking the distance from the bottom of the pitcher to the top of the pitcher.

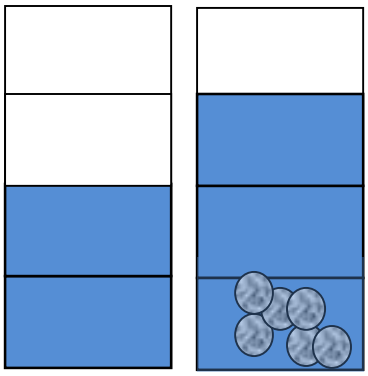


Write a fraction number sentence that describes this story.

Write a decimal number sentence that describes this story.

BLM-TM Unit 4, Lesson 1 **The Crow and the Pitcher**

One per group



Before pebbles After pebbles

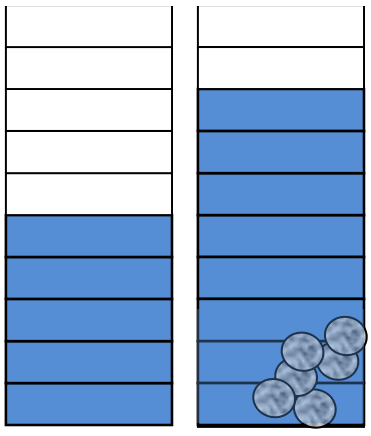
:

El cuervo sediento dejó caer piedras en el jarro y elevó el nivel del agua para poder beber.

Este jarro se divide en cuartos, y aumenta su nivel de agua hasta el tope del jarro en incrementos iguales. La cantidad de agua en el jarro se mantuvo igual, pero el nivel del agua subió.

Escribe una frase con número en fracción que describa lo que sucedió en esta historia:

Before pebbles After pebbles



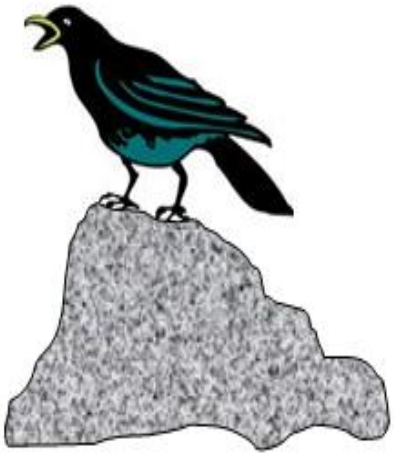
Este jarro se divide en _____, para cubrir la distancia desde el fondo del jarro a la parte superior de este.

Escriba una frase con número en fracción que describa esta historia:

Escriba una frase con número decimal que describa esta historia:

The Crow and the Pitcher Revisited

1. The thirsty crow had brought the water up to the 7/10 mark. She drank and drank, and when she was finished, the water was back to the 1/2 mark. Find the fraction that describes the water the crow drank.



2. The thirsty crow found a pitcher with only 3/8 cup of water in it. After dropping in pebbles, the water rose to the 3/4 cup level. Find the fraction that describes the fractional parts the pebbles caused the water to rise. (HINT: Draw a picture to help you see the math movie!)

3. A kind human saw the crow struggling. The human poured the 5/12 cup of water that was in the pitcher into a flat birdbath. Then the human added another 1/2 cup of water to the birdbath. How much water did crow have now in the birdbath?

The Crow and the Pitcher Revisited

1. El cuervo sediento dejó el nivel de agua en la marca de 7/10. Bebió y bebió, y cuando terminó, el agua volvió a la marca de 1/2. Encuentra la fracción que describe el agua que bebió el cuervo.

2. El cuervo sediento encontró un jarro con solo 3/8 de taza de agua en él. Después de dejar caer piedras, el agua subió al nivel de 3/4 de taza. Encuentra la fracción que describe la fracción de piedras que hizo que el nivel del agua subiera. (SUGERENCIA: ¡Dibuja una imagen para ayudarte a visualizar la historia matemática como una película!)

3. Un humano amable vio la dificultad del cuervo. El humano vertió 5/12 de taza de agua que había en el jarro en un bebedero de aves plano. Luego, el humano agregó 1/2 taza de agua al bebedero. ¿Cuánta agua tenía ahora el cuervo en el bebedero?

Materials
- **BLM** Percents – Special Fractional Parts
- **BLM** Percents – Special Fractional Parts (grid)
- yellow or orange crayon

Math Vocabulary
decimal
decimal point
tenths
hundredths
thousandths
compare
order
equivalent
percent

Literature Vocabulary
short-term
long-term
purchases/expenses
income
counterfeit
symbolize
contribution

ELPS (*English Language Proficiency Standards*)
1A, 1D, 1G, 2B, 2C, 2F, 2I, 3B, 3E, 3H, 3J, 4C, 4F, 4I, 5B, 5C, 5F, 5G

CCRS *(College and Career Readiness Standards)*
VIII – A1, S2, A3, A4, A5, B1, B2, C1, C2, C3
IX – A1, A2, A3, B1, B2, C1, C2, C3
X – B1

Unit 1, Lesson 3 — Grades 5-6

TV Lesson

Math Objectives:
- Compare and order two decimals to the thousandths and represent comparisons using the symbols >, <, or =.
- Represent ratios and percents with concrete models, fractions, and decimals.
- Represent benchmark fractions and percents such as 1%, 10%, 25%, 33 1/3%, and multiples of these values using 10 by 10 grids, strip diagrams, number lines, and numbers.
- Generate equivalent forms of fractions, decimals, and percents using real-world problems, including problems that involve money.
- Use equivalent fractions, decimals, and percents to show equal parts of the same whole.

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

Building Background
Finally we are going to work with the last word on our word wall – PERCENTS.

Per – cent, per 100. You worked with hundredths during your Classroom Lesson today. Percents are equivalent to hundredths. Let's find equivalent fractions, decimals and percents to show equal parts of the same whole.

First, look at the **BLM Special Fractions Parts (grid)**. Tell your Classroom Teacher everything that you can about this grid. *(Give a bit of a wait.)*

Things that I hope you observed are:
- This is a 10 x 10 grid which matches the number of squares in the top of the FLAT you were using in class – 100 squares.
- The grid is divided into four quadrants, or four equal pieces. By the way, "quadrant" is simply another word for fourths. The grid is divided into fourths.
- Did you notice that each quadrant is a 5 x 5 square? There are 25 squares in each quadrant.

You should have a light colored crayon which you'll use to color in the different portions of this hundred grid. Because I want you to see some very special relationships, we'll color inside one quadrant at a time as we create our equivalent fractions, decimals and percents.

OK, let's get started. You'll need your Percents – Special Fractional Parts record sheet.

Comprehensible Input
(As you work through the sheet with the students, remind them that the % sign can be used as a mathematical symbol instead of writing out percent each time. Remember to stay within the upper left quadrant as you color in numbers one – five. You want the students to see the 1/4 of the grid. It's much more important for students to visualize these benchmark percents than it is to teach them how to divide to find a percent. This is what helps students to develop number sense.)

(For six and seven, be sure to go to the upper right quadrant so students see the 50% and readily see that is half.)

(For eight, go to the lower left quadrant.)

(Finish the task in the lower right quadrant.)

Ask students to compare the following percents on the back of their BLM. Check each one after you've paused and given them time to write the comparison statements.

20% compared to 75%
25% compared to 10%
0.33 to 33%
If you have more time, give them comparisons with other percents that you have created on the grid.

Close with this comparison – do NOT check:
6% compared to 60%
Ask them now to compare 0.06 to 0.60.
Ask them to compare 6/100 to 60/100.

Tell them that after you leave them they will discuss as a class how they know their comparisons are true. What visuals do they see in their mind as they think about these comparisons?

Captain's Corner
How has the Measurement Lab modeled equivalent fractions during this unit?

Objectives:
Read through the math and language objectives, making sure that students understand how they accomplished each.

Teacher Note
Today we are helping students build the visual of the relationship between fractions, decimals and percents. Please do not show any way of arithmetically achieving the decimal – just models and relationships.

Unit 1 Lesson 3 – TV Lesson
One per student

Percents – Special Fractional Parts

1. Color in 0.01. Write as a fraction with a denominator of 100._____
   What percent of the grid does this represent? _____
2. Color in 0.05. Write as a fraction with a denominator of 100._____
   What percent of the grid does this represent? _____
3. Color in 0.10. Write as a fraction with a denominator of 100. _____
   What percent of the grid does this represent? _____
4. *Color in 0.20. Write as a fraction with a denominator of 100. _____
   What percent of the grid does this represent? _____
5. Color in 0.25. Write as a fraction with a denominator of 100._____
   What percent of the grid does this represent? _____
   Look at the grid. 25% is a benchmark percent. Find another fraction to represent this amount, a fraction in its simplest terms. _____
6. *Color in 0.33 of the grid. Write as a fraction with a denominator of 100. _____
   What percent of the grid does this represent? _____
7. Color in 0.50 of the grid. Write as a fraction with a denominator of 100. _____
   What percent of the grid does this represent? _____
   Look at the grid. 50% is a benchmark percent. Find another fraction to represent this amount, a fraction in its simplest terms. _____
8. Color in 0.75 of the grid. Write as a fraction with a denominator of 100. _____
   What percent of the grid does this represent? _____
   Look at the grid. 75% is a benchmark percent. Find another fraction to represent this amount, a fraction in its simplest terms. _____
9. Color in 1.00 of the grid. Write as a fraction with a denominator of 100. _____
   What percent of the grid does this represent? _____
   Look at the grid. 100% is a benchmark percent. If you are giving 100% of your effort, how much of your effort are you giving? _____
   What is another way to represent 100%? _____

BLM Unit 1, TV Lesson 3 **Percents – Special Fractional Parts**

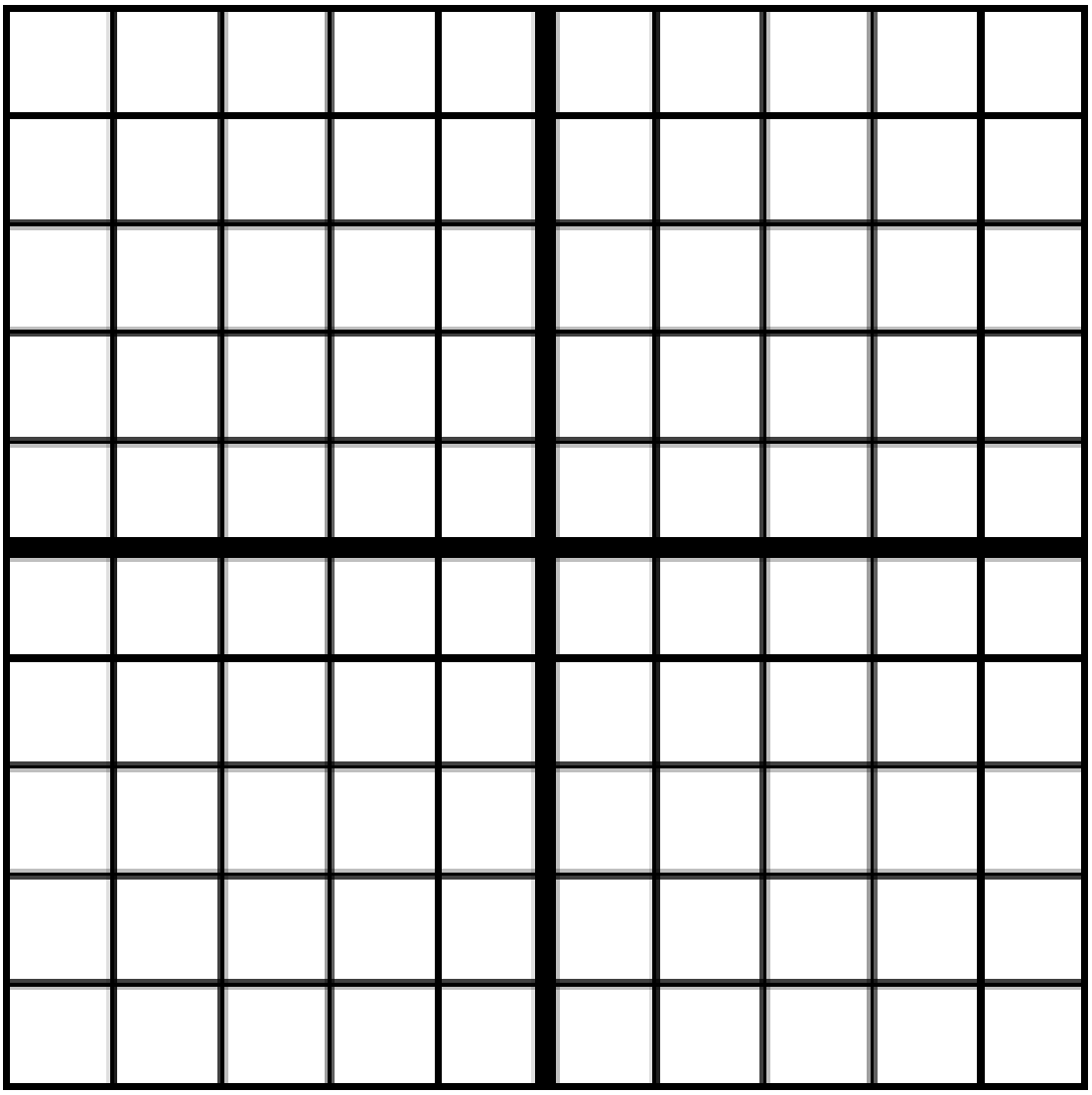
Name _____

1. Colorea 0.01. Escribe como una fracción con un denominador de 100._____
   ¿Qué porcentaje de la cuadrícula representa? _____
2. Colorea 0.05. Escribe como una fracción con un denominador de 100._____
   ¿Qué porcentaje de la cuadrícula representa? _____
3. Colorea 0.10. Escribe como una fracción con un denominador de 100. _____
   ¿Qué porcentaje de la cuadrícula representa? _____
4. *Colorea 0.20. Escribe como una fracción con un denominador de 100. _____
   ¿Qué porcentaje de la cuadrícula representa? _____
5. Colorea 0.25. Escribe como una fracción con un denominador de 100._____
   ¿Qué porcentaje de la cuadrícula representa? _____
   Mira la cuadrícula.. 25% es un porcentaje de referencia (*benchmark*). Busca otra fracción para esta misma cantidad, una fracción en su forma más simple. _____
6. *Colorea 0.33 de la cuadrícula. Escribe como una fracción con un denominador de 100._____ ¿Qué porcentaje de la cuadrícula representa? _____
7. Colorea 0.50 de la cuadrícula. Escribe como una fracción con un denominador de 100._____ ¿Qué porcentaje de la cuadrícula representa? _____
   Mira la cuadrícula.. 50% es un porcentaje de referencia (*benchmark*). Busca otra fracción para esta misma cantidad, una fracción en su forma más simple. _____
8. Color in 0.75 de la cuadrícula. Escribe como una fracción con un denominador de 100._____ ¿Qué porcentaje de la cuadrícula representa? _____
   Mira la cuadrícula. 75% es un porcentaje de referencia (*benchmark*). Busca otra fracción para esta misma cantidad, una fracción en su forma más simple. _____
9. Color in 1.00 de la cuadrícula. Escribe como una fracción con un denominador de 100._____ ¿Qué porcentaje de la cuadrícula representa? _____

Mira la cuadrícula. 75% es un porcentaje de referencia (*benchmark*). Si le pones 100% de tu esfuerzo, ¿cuánto de tu esfuerzo estás poniendo? _____¿Qué otra manera de representar 100% hay?_____

Unit 1 Lesson 3 – TV Lesson
One per student

Percents – Special Fractional Parts (grid)



Materials
- Color tiles – 10 red, 10 blue, 10 yellow per student
- **BLM** TM – completed Transition to Math sheet
- **BLM** – Ratio and Proportion

Math Vocabulary
ratio
proportion
equivalent ratios
variables

Literature Vocabulary
detective
victim
suspect
culprit
clue
evidence
motive

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

CCRS *(College and Career Readiness Standards)*
I – BC
VIII – A1, A2, A3, A4, A5, B1, B2, C1, C2, C3
IX – A1, A2, A3, B1, B2, C1, C2, C3
X – B1

Unit 3, Lesson 1 — Grades 5-6

TV Lesson

Math Objectives:
- Give examples of ratios as multiplicative comparisons of two quantities describing the same attribute.

Language Objectives:
- Discuss problem solving strategies with peers.
- Write out solutions for solving problems.
- Justify their thinking and strategies.

Building Background
In your classroom lesson you looked carefully at a color chart which presented the number of each color of drops of primary colors it took to make a new color. (*Show copy of **BLM** TM that has been completed.*)

In all of your answers, you found a relationship between the drops of primary color and the total number of drops in the new color of paint. Just like your snack fractions, you were finding a fractional relationship. This "part" out of the "whole."

Today, we're going to look at a different relationship. We're going to begin our study of PROPORTIONAL relationships. We will look at the part to the whole, but we will also look at the relationship of the different parts to one another.

We will express that relationship in a RATIO.

There are three ways to express RATIOS. Let's look at your record sheet from your classroom lesson.

Celery Green
We can express each of these fractional relationships as a ratio. With a ratio, we are comparing what is in the numerator to whatever is in the denominator, so our language is different than when we are representing with fractions.

- We can represent our ratio using words:
  One drop of red paint ***to*** five total drops of paint
- Or we can express this same relationship using a colon:
  One drop of red paint ***:*** five total drops of paint *(read the colon as "to")*
- Or we can express this same relationship using a fraction:

  1 drop of red paint (to)
  5 drops of paint

We have shown a proportional relationship. Every time we mix these colors together using this proportion, we will get celery green.

We are going to look at part to whole proportional relationships, and we are going to look at part to part proportional relationships during this unit. Let's get started.

Comprehensible Input
In our celery green example, we looked at the ratio of the drops of each individual paint color to the total number of drops in the color.

Now, let's look at the ratio of the number of drops in each color to another color. This is a "part-to-part" comparison.

Let's look at our record sheet for today, **BLM** Ratio and Proportion. *(Point to the appropriate areas on the chart.)*
We're going to investigate Celery Green, but look at this first column.

We are going to compare the ratio of

- red drops of paint to yellow drops of paint;
- red drops of paint to blue drops of paint;
- and yellow drops of paint to blue drops of paint.

In other words, we are comparing parts of the new color to other parts of the new color. If you want celery green, you have to use these exact proportions of colors.

(*Use the **BLM** Ratio and Proportion TEACHER KEY as your guide to filling out the chart with the students.)*

Our first row is to compare the ratio of red drops to yellow drops.

- We want to model that in color tiles. Tell your teacher what you would use to model the number of red drops of paint to the number of yellow drops of paint. *(Pause, then use your color tiles to model 1 red and 3 yellow.)*

- Our next representation is to use the word "to." Tell your teacher how you would use this representation to show the ratio of the number of red drops of paint to the number of yellow drops of paint (*pause, then write and say 1 to 3*).
- Now let's use the colon representation of ratio. Tell your teacher what you would write to show this representation of the number of red drops of paint to the number of yellow drops of paint *(pause, then write 1:3 and read one to three).*

- Our last representation is to show this ratio in fraction form. This form is going to be very helpful to us as we use ratio for predicting answers. Tell your teacher how you would write and how you would read this representation of ratio. (*Pause then write 1 red/3 yellow, using the horizontal fraction bar, of course; and READ the ratio as 1 red to 3 yellow.)*

The next two columns are interesting. You are going to use this ratio to determine changes to the mixture. Remember, you can ONLY mix celery green if you use the same ratio or proportion of the drops of color. Sometimes you'll need more paint than just a little drop.

Suppose you needed THREE drops of red paint? Tell your teacher how you can use the fraction form of the ratio to find the number of yellow drops you need. Predict your answer, then we will work through a simple algorithm to verify our predictions. (*longer pause*)

We can set up our ratios to find EQUIVALENT RATIOS. Finding equivalent ratios is very much like finding equivalent fractions. Let's use this simple example to work through the steps.

We know that our original ratio is one red drop to three yellow drops. Let write that fraction representation *(do so, using the labels).*

Now I want to find another ratio, so let me draw that ratio line, and label the numerator and denominator. I must ALWAYS compare in the same way in each ratio. I have compared the original ratio, red to yellow, so my other ratio must also compare red to yellow. (*Write the fraction line and "red" in the numerator and "yellow in the denominator.)*

The problem gives me the red. I want three drops of red. I need to find out how many yellow drops I need. Let's use a VARIABLE to take the place of that number. It can be any letter, but I'm going to use *x* just because you will be seeing a lot of *x* as you begin to work in Algebra with equations. This *x* simply marks the spot of the number I'm trying to find, the UNKNOWN QUANTITY.

This is our equation to solve, then. One red drop to three yellow drops is the same as three red drops to how many yellow drops?
How would you solve this equation? Tell your classroom teacher.
(longer pause)

$$\frac{\text{1 red}}{\text{3 yellow}} = \frac{\text{3 red}}{x \text{ yellow}}$$

One way is just to look at the equation. What did you multiply the one red by to get three red? *(slight pause - 3)* So if you multiplied the numerator by three, what must you multiply the denominator by? Remember, you want the new ratio to be in the same proportion as the original ratio – they must be equivalent! *(pause - 3)* 3/3 is a form of one. When I multiply this first ratio by a form of one, the product might LOOK different, but it represents the same quantity, just in a different form.

So, if I multiply the original ratio by 3/3, what is my new denominator? *(pause - 9)*

$$\frac{3 \times}{3 \times}\ \frac{1 \text{ red}}{3 \text{ yellow}} = \frac{3 \text{ red}}{x \text{ yellow}}$$

x = 9 yellow drops

Now I know that if I have three drops of red, I must also use nine drops of yellow to give me the correct proportion to make celery green.

The last column asks you to find the ratio of red to yellow if six drops of red were used. Work that as a class, then we'll verify the same way. (*Generous pause, then talk through this set up the same way.)*

$$\frac{6 \times}{6 \times}\ \frac{1 \text{ red}}{3 \text{ yellow}} = \frac{6 \text{ red}}{x \text{ yellow}}$$

x = 18 yellow drops

1 to 3, 3 to 9 and 6 to 18 are all equivalent ratios. There is another way to solve for x. Sometimes the relationships will not be as obvious as they are in these examples. Sometimes you might need to cross – multiply. Cross multiplication works great, especially when the relationship is not as easy to see as in these two examples. Let's work through these two using cross multiplication.

We can set up our ratios in the same way as we did in our earlier example. This time, though, we are going to multiply in a cross shape.

1 x x = x $\quad \frac{1 \text{ red}}{3 \text{ yellow}} \times \frac{3 \text{ red}}{x \text{ yellow}} \quad$ **3 x 3 = 9**

I have x on one side of the equal sign and nine on the other.

x = 9

Unit 3, Lesson 1 — Grades 5-6

TV Lesson - continued

Why does this work? Because we are really shortcutting our process. I know that I have to multiply that original one red by three to get the new three red. If I multiply the numerator by three, I must also multiply the denominator by three. Let's work the second ratio this way so you can see the difference.

1 x x = x $\qquad$ $\frac{\text{1 red}}{\text{3 yellow}} = \frac{\text{6 red}}{x \text{ yellow}}$ $\qquad$ **3 x 6 = 18**

I have x on one side of the equal sign and 18 on the other.

$$x = 18$$

You may use either strategy, so long as you can explain why they work. Remember, a strategy is only a workable strategy if you can remember how to use it. Practice both ways of solving problems, and explain how each works.

Pirate's Corner

Tell us all the different strategies used today to solve the Fraction Action. Share any work you would like for the rest of us to see.

Objectives

Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 3 Lesson 1 – Transition to Math
One per group

Paint Store Relationships

Ellory Paint Store can mix just about any color of paint a customer wants. The following color chart tells the person mixing the colors how much of each color to add to a white base to make specific colors.

	Red	Yellow	Blue
Celery Green	1	3	1
Persimmon Orange	3	1	0
Lilac	1	0	3
Colonial Blue	0	1	4
Mango Yellow	4	6	0

Use the chart to answer the following questions:

We will consider the "whole" to be a combination of all of the colors for the paint.

What fractional part of Celery Green is: red _____ yellow _____ blue _____
Express each fraction as a decimal: red _____ yellow _____ blue _____
What percent of the new color is: red _____ yellow _____ blue _____

What fractional part of Persimmon Orange is: red _____ yellow _____ blue _____
Express each fraction as a decimal: red _____ yellow _____ blue _____
What percent of the new color is: red _____ yellow _____ blue _____

What fractional part of Lilac is: red _____ yellow _____ blue _____
Express each fraction as a decimal: red _____ yellow _____ blue _____
What percent of the new color is: red _____ yellow _____ blue _____

What fractional part of Colonial Blue is red _____ yellow _____ blue _____
Express each fraction as a decimal: red _____ yellow _____ blue _____
What percent of the new color is: red _____ yellow _____ blue _____

What fractional part of Mango Yellow is red _____ yellow _____ blue _____
Express each fraction as a decimal: red _____ yellow _____ blue _____
What percent of the new color is: red _____ yellow _____ blue _____

http://painting.about.com/library/blpaint/blcolormixingpalette1.htm Online Mixing Palette for Painters. Mix and name your own colors. What happens when you use secondary colors?

Unit 3 Lesson 1 – Transition to Math
One per group

Paint Store Relationships

La tienda de pinturas Ellory Paint Store puede crear cualquier color de pintura que pueda requerir un cliente. La próxima carta de colores indica a la persona que mezcla los colores cuánta cantidad de cada color debe añadir a una base blanca para crear colores específicos.

	Rojo	Amarillo	Azul
Verde apio	1	3	1
Anaranjado	3	1	0
Lila	1	0	3
Azul colonial	0	1	4
Amarillo mango	4	6	0

Usa la carta de colores para contestar las siguientes preguntas:

Consideraremos el "entero" como una combinación de todos los colores para crear la pintura.

Qué fracción de Verde Apio es: rojo _____ amarillo_____ azul _____
Expresa cada fracción como decimal: rojo _____ amarillo _____ azul _____
Qué por ciento del nuevo color es: rojo _____ amarillo _____ azul _____

Qué fracción de anaranjado es: rojo _____ amarillo_____ azul _____
Expresa cada fracción como decimal: rojo _____ amarillo _____ azul _____
Qué por ciento del nuevo color es: rojo _____ amarillo _____ azul _____

Qué fracción de lila es: rojo _____ amarillo_____ azul _____
Expresa cada fracción como decimal: rojo _____ amarillo _____ azul _____
Qué por ciento del nuevo color es: rojo _____ amarillo _____ azul _____

Qué fracción de azul colonial es: rojo _____ amarillo_____ azul _____
Expresa cada fracción como decimal: rojo _____ amarillo _____ azul _____
Qué por ciento del nuevo color es: rojo _____ amarillo _____ azul _____

Qué fracción de amarillo mango es: rojo _____ amarillo_____ azul _____
Expresa cada fracción como decimal: rojo _____ amarillo _____ azul _____
Qué por ciento del nuevo color es: rojo _____ amarillo _____ azul _____

http://painting.about.com/library/blpaint/blcolormixingpalette1.htm Online Mixing Palette for Painters. Mix and name your own colors. What happens when you use secondary colors?

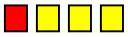
Ratio and Proportion - KEY

Color Chart

	Red	Yellow	Blue
Celery Green	1	3	1
Persimmon Orange	3	1	0
Lilac	1	0	3
Colonial Blue	0	1	4
Mango Yellow	4	6	0

Use the chart to answer the following questions:

We are going to look at different relationships on the chart.

Celery Green	**color tiles**	part TO part	**part:part**	**part / part**	**What would the ratio be if you increased the red paint to 3 drops?** (fraction form)	**What would the ratio be if you increased the red paint to 6 drops?** (fraction form)
Compare ratio of red and yellow drops		1 to 3	1:3	**1 red / 3 yellow**	**3 red / 9 yellow**	**6 red / 18 yellow**
Compare ratio of red and blue drops		1 to 1	1:1	**1 red / 1 blue**	**3 red / 3 blue**	**6 red / 6 blue**
Compare ratio of yellow and blue drops		3 to 1	3:1	**3 yellow / 1 blue**	**9 yellow / 3 blue**	**6 yellow / 2 blue**

Ratio and Proportion

Color Chart

	Red	Yellow	Blue
Celery Green	1	3	1
Persimmon Orange	3	1	0
Lilac	1	0	3
Colonial Blue	0	1	4
Mango Yellow	4	6	0

Use the chart to answer the following questions:

We are going to look at different relationships on the chart.

Celery Green	**color tiles**	part TO part	**part:part**	**$\frac{\text{part}}{\text{part}}$**	**What would the ratio be if you increased the red paint to 3 drops?**	**What would the ratio be if you increased the red paint to 6 drops?**
Compare ratio of red and yellow drops						
Compare ratio of red and blue drops						
Compare ratio of yellow and blue drops						

Ratio and Proportion

Carta de colores

	Rojo	Amarillo	Azul
Verde apio	1	3	1
Anaranjado	3	1	0
Lila	1	0	3
Azul colonial	0	1	4
Amarillo mango	4	6	0

Usala carta de colores para contestar las siguientes preguntas:

Consideremos las relaciones diferentes en la carta.

Verde apio	**Azulejos de colores**	Parte a parte	**Parte:parte**	**Parte / parte**	**¿Cuál sería la razón ("ratio") si añadieras 3 gotas adicionales de pintura roja?**	**¿Cuál sería la razón ("ratio") si añadieras 6 gotas adicionales de pintura roja?**
Compara la razón de gotas de amarillo y rojo						
Compara la razón de gotas de rojo y azul						
Compara la razón de gotas de amarillo y azul						

Materials
- **BLM** Detective Successes

Math Vocabulary
ratio
proportion
equivalent ratios
variables

Literature Vocabulary
detective
victim
suspect
culprit
clue
evidence
motive

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

CCRS *(College and Career Readiness Standards)*
I – BC
VIII – A1, A2, A3, A4, A5, B1, B2, C1, C2, C3
IX – A1, A2, A3, B1, B2, C1, C2, C3
X – B1

Unit 3, Lesson 2 — Grades 5-6

TV Lesson

Math Objectives:
- Give examples of ratios as multiplicative comparisons of two quantities describing the same attribute.
- Represent ratios and percents with concrete models, fractions, and decimals.

Language Objectives:
- Discuss problem solving strategies with peers.
- Write out solutions for solving problems.
- Justify their thinking and strategies.

Building Background
Mickey Rangel is quite a detective. His solution ratio is 10:10, which means he solves every mystery. But, his solution ratio is 7:10 without backup from Angel, which means he does need help from time to time to solve some mysteries. Like batting averages, this way of showing success is very helpful in predicting future success.

There are other great child detectives that you can read about. Today, we are going to investigate their solution ratios, find their percent of success, and predict future success.

Comprehensible Input
Let's use ratio and proportion to determine Mickey's success ratio as a percent. Tell your Classroom Teacher what proportion equation you would set up to find an equivalent proportion that you could easily represent as a percent. *(generous pause)*

Well, I already know his solution ratio, which is 7:10. I can express that as a fraction *(do so)*. If I want to represent that as a percent, I know that I can find an equivalent ratio with a denominator of 100. Let's use our friendly variable again – I'm going to use *x,* but you can use any letter you wish.

$$\frac{\textbf{7 solved mysteries without backup}}{\textbf{10 mysteries}} = \frac{\textbf{x solved w/o backup}}{\textbf{100 mysteries}}$$

You can cross multiply if you wish; but I think I will just multiply by a form of one because I know that 10 x 10 will give me the 100 in the equivalent ratio.

$$\frac{\textbf{10x}}{\textbf{10x}}\ \frac{\textbf{7 solved mysteries without backup}}{\textbf{10 mysteries}} = \frac{\textbf{x solved w/o backup}}{\textbf{100 mysteries}}$$

Multiplying 10 x 7 = 70; 10 x 10 = 100; so:

$$\frac{70}{100} = \frac{x}{100}$$

Obviously, $x = 70$

70 / 100 is in hundredths: 70 hundredths = 70 per 100 or 70%.

So Mickey Rangel's percent of mysteries solved without back up is 70%. We can fill in the percent of success column for Mickey Rangel *(do so).*

Let' jump down to Harris Burdick (*you want to make sure you do a problem which would be easier with cross multiplication*).

Harris Burdick solution ratio without backup is 10:15. I can write that as a fraction. Please do so with me *(do so).* Now, I don't know about you, but I can't think of a number quickly that I can multiply 15 by to get 100, so I'm going to cross multiply.

100 x 10 = 1000 $\frac{\text{10 success}}{\text{15 mysteries}} \times \frac{x}{100}$ $15(x) = 15x$

So I have 1000 on one side of the equal sign, and 15*x* on the other.

$$1000 = 15x$$

I need to get *x* by itself. How would you do that? Please quickly give your suggestions to your Classroom Teacher. *(pause)*

I see that I am multiplying *x* by 15 on the right side of the equation. If I divide 15*x* by 15, that will give me *x*.

But remember, you want to keep both sides of the equation in proportion. You must also divide the left side of the equation by 15. That would be 1000 divided by 15. Please divide that out with me *(do so)*.

x then equals 88.8

I replace *x* on the right with 88.8 which gives me 88.8/100, or 88.8 hundredths which is 88.8 percent or 88.8%. Let's fill in Harris Burdick's percent of success.

	Unit 3, Lesson 2 **Grades 5-6** **TV Lesson** - continued **----------** (*Solve as many as you have time to solve. It is suggested that you see the relationships of 5, 20, and 25 to 100 so you can model multiplying out by a form of one rather than cross multiplying. Only Cam Jansen would need cross multiplication as 12 is not as easy for the students to see.)* **Pirate's Corner** Tell us what your results were on your graph today, and how people explained their answers. **Objectives:** Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 3 Lesson 2 – TV Lesson
One per student

Detective Successes

Here are the names of young detectives and their solution ratios for mysteries they solved WITHOUT help from others. Which detective would you hire to help you and why?

Detective	Solution Ratio (without backup)	Percent of Success
Mickey Rangel	7:10	
Encyclopedia Brown	3:5	
Nate the Great	15:20	
Harris Burdick	10:15	
Trixie Belden	21:25	
Cam Jansen	9:12	

Which detective would you choose just by looking at these solution ratios?

_____

Use ratio and proportion to determine their percent of success.

Using the percent of success without back up, I would choose

_____

to solve a mystery for me because….

Unit 3 Lesson 2 – TV Lesson
One per student

Éxitos detectivescos

He aquí los nombres de detectives jóvenes y los cocientes que usaron para resolver los misterios que los ocupaban SIN ayuda de los demás. ¿Qué detective reclutarías para que te ayude y por qué?

Detective	Razón de solución (sin ayuda)	Porcentaje de éxito
Mickey Rangel	7:10	
Encyclopedia Brown	3:5	
Nate the Great	15:20	
Harris Burdick	10:15	
Trixie Belden	21:25	
Cam Jansen	9:12	

¿Qué detective escogerías con solo ver estos cocientes utilizados para resolver el problema?

_____

Utiliza cociente y proporción para determinar el porcentaje de éxito de los detectives.

Si usaras el porcentaje de éxito sin apoyo, escogería a

_____

para resolver un misterio para mí porque….

Materials
- **BLM** – Country Percents, City Percents
- Four-function calculators -- one per student pair

Math Vocabulary
unlike denominators
like denominators
unit price
ratio
proportion
percent
greatest common factor
least common multiple

Literature Vocabulary
moral
trait
patient
impatient
greedy
generous
adventurous
cautious

ELPS (*English Language Proficiency Standards*)
2C, 2E, 2G, 3E, 3G, 3H, 4G, 4I, 4K, 5B

CCRS *(College and Career Readiness Standards)*
I – BC
VIII – A1, A2, A3, A4, A5, B1, B2, C1, C2, C3
IX – A1, A2, A3, B1, B2, C1, C2, C3
X – B1

Unit 4, Lesson 3 — Grades 5-6
TV Lesson

Math Objectives:
- Solve real-world problems to find the whole given a part and the percent, to find the part given the whole and the percent, and to find the percent given the part and the whole, including the use of concrete and pictorial models.

Language Objectives:
- Discuss problem solving strategies with peers.
- Write out solutions for solving problems.
- Justify their thinking and strategies.

Building Background
Your story about the City Mouse and the Country Mouse was very interesting. The story does demonstrate how each of us has our own likes and dislikes and own wants and needs.

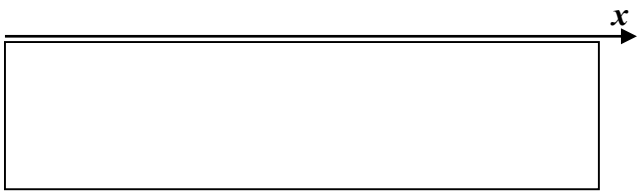
I was thinking about the different ways that math is used in the city and in the country, particularly fractions, ratio, and percent. So today during our time together we'll investigate one of the ways percent is used, "percent of." We are going to visualize each problem to find our solution. We'll take our math movie and draw it out in a special way. And you'll be solving problems that your older brothers and sisters have difficulty doing!

Comprehensible Input
VISUALIZE IT!
When we work with "percent of" something, I like to think of a rectangle that is divided into equal portions. The rectangle equals the WHOLE, whatever the whole is.

Let's read our first problem together. *(Do so.)*
- What is the math movie you see when you read this problem? *(pause)* I see a big sack of flour, and Mrs. Rico uses some of it.
- What do we know? *(pause)*
  - She used 20% of the flour.
  - She had 10 pounds left over after she took out 20%.
- I want to visualize this problem. Let's use the rectangle.

First, draw your visualization rectangle under problem #1 on your problem sheet. Let's draw in what we know and what we want to know.

- Do we know the total amount of flour that was in the new bag? *(pause)* No, so that is our *x*, our unknown.



  You can mark that any way you want. I like to use an arrow to show that I mean the WHOLE rectangle. Whatever works for you is fine. Make it yours. Make it simple.

- Let's start marking the rectangle with what we DO know.
  - We know that she used 20%. How can I visualize 20%? I want to think in fractional parts. What is an equivalent fraction for 20%? Talk with your partner and see if you can find a simplified equivalent fraction for 20%. *(generous pause, then talk through the following*)
  - Let's find a factor that divides into both the numerator and denominator. Remember, we have to divide by a form of ONE to keep the value the same. Well, I see that 10 is a factor of both 20 and 100. Let's try 10.

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

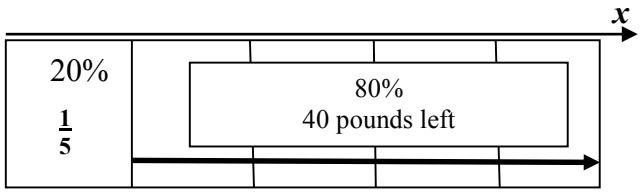
  - Hmm, my equivalent fraction is 2/10. I see that both the numerator and denominator are even numbers. I know that two is a factor of both. Let's divide both the numerator and denominator by two. Please do that while I do it.

$$\frac{20 \div 10 = 2 \div 2 = 1}{100 \div 10 = 10 \div 2 = 5}$$

  - Now I have a unit fraction, or a fraction with one in the numerator. I KNOW this is in simplest terms.

  - Now I know that 20% is equivalent to 1/5. You know, boys and girls, 20% is a benchmark percent. Many of you might have already known that 20% is equivalent to 1/5. When you know your benchmarks, it saves you a lot of steps later!! 20% = 1/5. I'll remember that one!

- Since we know that 20%, or 1/5, of the flour has been used, what percent or fraction do we know is LEFT in the bag? *(pause)* 80%, or 4/5, of the flour is left in the bag. Let's divide this rectangle into the fifths, or the 20% portions. (*Do so -- to divide the rectangle into fifths easily, first visualize the fifths and mark off the first portion on the left; then divide the portion on the right into fourths. Just model it, don't explain it to the students)*

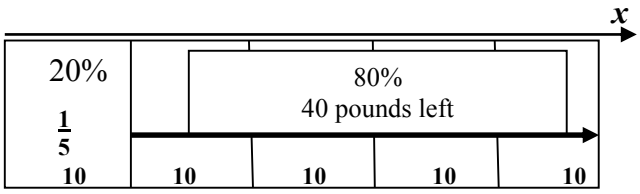


- She used 20%, so I can mark that.
- Since I know she used 20%, I know that 80%, or 4/5, of the flour is left in the bag; and I know that the remainder is 40 pounds, so I can mark that, too.

This is what makes sense to me. This is my description of the story. I am looking at my description, and I can see:

- How much flour is in each one of those imaginary fifths or 20%
- How much flour she took out at first
- And how much flour was in the bag to begin with

Can YOU see it? Talk to your class about the rectangle description of the problem. See if you can find all of those quantities. (*Project the rectangle and the three bullets above. Give a generous pause, then answer each question*)



- **How much flour is in each one of those imaginary fifths or 20%?**
  (I have 40 pounds left over. Look at the imaginary spaces in the left over portion -- how many spaces are there? (4) Well, if I divide that 40 pounds equally into those 4 spaces, how many pounds will be in each space? (10 pounds – mark each section with 10)

- **How much flour did she take out at first?**
  (If each of the spaces is equal, then there must be 10 pounds in what she took out, too.)
- **And how much flour was in the bag to begin with?**
  (Pretty easy to see now how much flour was in the sack, wasn't it.)

DESCRIBE WITH NUMBER AND VARIABLES
We have the visual. Now let's see what we did and describe it with a number sentence.

We know we're trying to find the total amount of flour. That's *x*.
And we know that if we take the flour she had left over, that's 40, and add it to what she took out, and that is 20% of the total, we'll have the total. And I know that I want to use either the decimal or fraction representation of the percent so I can compute with it.

$$x = 40 + .20x$$

Can you see that in the rectangle visualization? (*Point to each part in the picture and tie it back to the equation.)*

Now, let's solve for *x*.

I want to get the *x*'s on one side of the equation and the whole numbers on the other. I see that I have 1*x* on the left and .20*x* on the right. What am I doing with the .20*x* on the right side of the equation? *(adding)* So, I can subtract the .20*x* from the right to get the 40 by itself.

But, I have to subtract the .20x from the left side also, or else I won't be treating each side equally. *(Show out to the side subtracting .20 from 1.00)*

$$x = 40 + .20x$$
$$x - .20x = 40 + .20x - .20x$$
$$.80x = 40$$

Take look at our equation. We do not have *x* by itself yet.
We are MULTIPLYING by .80. Well if we are multiplying, how can we get rid of the .80 on the left side of the equation? *(Divide by .80.)*
And if we divide by .80 on the left, we have to divide by .80 on the right so that we treat each side equally.

$$x = 40 + .20x$$
$$x - .20x = 40 + .20x - .20x$$
$$\underline{.80x = 40}$$
$$.80 = .80$$

	Unit 4, Lesson 3 **Grades 5-6** **TV Lesson** - continued --- As 5th and 6th graders, we haven't experienced multiplying and dividing decimals yet, so we can use this handy tool, the calculator to do that arithmetic for us! First, put in 40 into your calculator. Now hit the division key and put in decimal 80. Hit equals. What do you get? *(pause)* Your answer should have matched our picture -- 50. What does that 50 stand for? *(the pounds of flour in the bag when it was first bought)* Especially as we are beginning our work with "percent of," it is very important that you visualize the problem. Even grown-ups get lost in percent because they forget what each part of the problem represents. We have visualized the problem, described the problem in numbers and variables, then used a tool to help solve the problem when the arithmetic is beyond our level. We've done a great job today! **Pirate's Corner** Explain your solution strategy for today's Fraction Action. How many different strategies were there in the room? **Objectives** Read through the math and language objectives, making sure that students understand how they accomplished each.

Country Percents, City Percents

Work with your teacher and in groups to solve the problems.

1. Mrs. Rico bought a sack of flour. She used 20% of the flour from the sack and still had 40 pounds left. How many pounds of flour were in the bag when she bought it? *Use the rectangle model to visualize and solve this problem.*

2. Henry stayed with his parents in a hotel in Hannibal, MO to visit the Mark Twain Museum. The room cost $80 dollars, and there was a hotel tax added of 5%. What was the cost of the room with hotel tax? *Use the rectangle model to visualize, then solve this problem with a number/variable equation and a calculator.*

3. Mari ate lunch in the local café. Her total food and beverage bill with tax was $10.50. She left the waitress a 20% tip. What was her total bill? *Use the rectangle model to visualize, then solve this problem with a number/variable equation and a calculator.*

Country Percents, City Percents

1. La Sra. Rico trajo un saco de harina. Usó el 20% de la harina del saco y todavía le quedaban 40 libras. ¿Cuántas libras de harina había en la bolsa cuando ella la compró? *Utiliza el modelo de rectángulo para visualizar y resolver este problema.*

2. Henry se quedó con sus padres en un hotel en Hannibal, MO, para visitar el Mark Twain Museum. La habitación cuesta $80 dólares, y se agregaba un impuesto hotelero del 5%. ¿Cuál era el costo de la habitación incluido el impuesto hotelero? *Utiliza el modelo de rectángulo para visualizar; luego, resuelve este problema con una ecuación de números/variable y una calculadora.*

3. Mari almorzó en la cafetería local. La cuenta total por los alimentos y la bebida que consumió fue de $10.50. Le dejó a la mesera una propina de 20%. ¿Cuánto fue el total de su cuenta? *Utiliza el modelo de rectángulo para visualizar; luego, resuelve este problema con una ecuación de números y variable más una calculadora.*

Materials
- **BLM** Shadow Math Sailboat

Math Vocabulary
unlike denominators
like denominators
unit price
ratio
proportion
percent
greatest common factor
least common multiple

Literature Vocabulary
theme
point of view
influence
confident
revolution

ELPS (*English Language Proficiency Standards*)
2C, 2E, 2I, 3D, 3F, 3G, 4D, 4F, 4J, 5B, 5C

CCRS *(College and Career Readiness Standards)*
I – BC
VIII – A1, A2, A3, A4, A5, B1, B2, C1, C2, C3
IX – A1, A2, A3, B1, B2, C1, C2, C3
X – B1

Unit 5, Lesson 3 — Grades 5-6

TV Lesson

Math Objectives:
- Apply qualitative and quantitative reasoning to solve prediction and comparison of real world problems involving ratios and rates.
- Give examples of ratios as multiplicative comparisons of two quantities describing the same attribute.

Language Objectives:
- Discuss problem solving strategies with peers.
- Write out solutions for solving problems.
- Justify their thinking and strategies.

Building Background
The poem "I Am Standing – Girl on Land, Boy at Sea" is a terrific read-aloud poem. It also triggered my math mind to see comparisons in where the girl and boy were standing. How high were the girl and boy when they were climbing up that tree and up that sail? Could they have been about the same height? We're going to investigate today using your data that you gathered during the Transition to Math in the Classroom to find out.

As I looked at the sail in the illustration and researched sailboats, I decided that this was a Bermudan rig. And since the boy was apparently by himself, I perceived that the sailboat was a "day sailor," or a sailboat that could be handled by one person. With that information, I decided that the Bermudan rig, the sail, was somewhere between 100 and 110 feet tall. We'll consider that the sail was somewhere toward the middle, or 104 feet tall.

Now, I have a friend named Norma who is 5 feet 5 inches tall, and who measured her shadow at 10 AM yesterday. The shadow that she cast was 10 feet long. What can I find using the data that I have?

Norma's height = 5 feet 5 inches
Norma's shadow length = 10 feet at 10 AM yesterday.
The Bermudan rig height = 104 feet

Comprehensible Input
We have a mixture of feet and inches in this data, so let's convert all of the measurements to inches.

5 feet 5 inches. Talk in your class about how to convert 5 feet 5 inches to inches. *(pause)*

There are several ways, but I'm going to use a ratio. That way I never have to remember whether I have to multiply or divide. The ratio takes care of that for me.

First, how many inches in ONE foot? *(pause) 12 inches = 1 foot*
Remember that we have to compare the same things in each ratio.
What do we want to know? *(pause) (the inches)* That becomes our *x*.
And how many whole feet do we have? *(pause) 5*

$$\frac{12 \text{ inches}}{1 \text{ foot}} = \frac{x \text{ inches}}{5 \text{ feet}}$$

$x = 60$ INCHES

What does the 60 represent? *(pause)*
There are 60 inches in 5 feet; now we add the extra 5" in Norma's height. 5 feet 5 inches = 65 inches. Lets' record both the 5 feet 5 inches and the 65 inches on our record sheet. *(Do so.)*

Since we now have Norma's height in inches, what other measurement do we need to convert from feet to inches? *(pause)* There are two. We need Norma's shadow's length, and we need the height of the Bermudan Rig.

What was Norma's shadow's length yesterday at 10AM? *(pause)* 10 feet. Can we use number sense to convert 10 feet? How many inches in 1 foot? *(pause) 12* In 2 feet? *(pause) 24*; in 3 feet? *(pause) 36*. What are we doing to 12 each time? *(pause) multiplying the feet by 12* So what is 12 x 10? *(pause)* 120

What does the 120 represent? *(pause)* The number of inches in 10 feet. Let's record both the 10 feet and the 120 inches on the record sheet. *(Do so.)*

One last conversion -- the Bermudan Rig Height. If we use the 104 feet as the height, how many inches is that? Figure that one with a partner. *(pause)*

I think I'll set up for equivalent ratios to solve that one.

$$\frac{12 \text{ inches}}{1 \text{ foot}} = \frac{\boldsymbol{x} \text{ inches}}{104 \text{ feet}}$$

1248 = *x inches*

What does the 1248 represent? *(pause) the number of inches in 104 feet*
The height of the Bermudan Rig is 104 feet.

I should now have most of my table on the record sheet completed.
What is still left to find? *(pause) Bermudan Rig Shadow Height*

There are several ways to solve this problem. I'm going to solve with ratios. Here is how I'll set up for equivalent ratios.

Norma's height = 65 inches and I'm going to compare that to
Bermudan Rig = 1248 inches

So that is the REAL object's height to the second REAL object's height.

Now I want to compare the two shadow heights. Which shadow height has to be the numerator and why? Discuss. *(pause)*

Norma's height is the numerator of the first ratio; so Norma's shadow's height has to be the numerator of the second ratio. And that was 120 inches.

Then the denominator of the second ratio has to be the Bermudan Rig's shadow. What will represent that length? *(pause) x*

$$\frac{65 \text{ inches}}{1248 \text{ inches}} = \frac{\mathbf{120} \text{ inches}}{x \text{ inches}}$$

Cross Multiply. $65x = 149{,}760$

What do we do next? *(pause)*
We want x to be on one side of the equation and the numbers without a variable on the other side of the equation. If I am multiplying x by 65, what can I do to have x by itself? *(pause) DIVIDE by 65.*
65 divided by 65 is ONE, and any number divided by one is that number. So x divided by one is x.

And of course, if we divide one side of the equation by 65, we have to do the same to the other side of the equation to keep both sides equal, or balanced. Divide 149,760 by 65. *(pause) 2304* What does 2304 represent? *(pause) The length in inches of the sail's shadow.* Record that on the record sheet.

Did anyone solve that a different way? Please put a star on your paper, and discuss your strategy during the Follow-up Lesson. Mine is NOT the only ratio set up that represents this relationship!

Only one space left to solve for now. What is the length of the Bermudan Rig's Shadow in feet?

How would you convert the 2304 inches to feet? Very quickly, talk to your partner and decide how you would convert 2304 inches to feet. *(generous pause)*

You know I'm going to use a ratio. As long as you do the arithmetic correctly, and set up the ratios correctly, the ratio will not let you down! You also know that the ratio I'll show you is NOT the only ratio that represents this relationship -- so see if you have a different equivalent ratio set up from mine.

OK
What do I know? 2304 inches = Bermudan Rig Shadow length
And that there are 12 inches in 1 foot.

What do you want to know?
How many feet there are in 2304 inches?

$$\frac{12 \text{ inches}}{1 \text{ foot}} = \frac{\mathbf{2304} \text{ inches Bermudan Rig Shadow}}{x \text{ feet Bermudan Rig Shadow}}$$

$$12x = 2304$$

$$x = 192$$

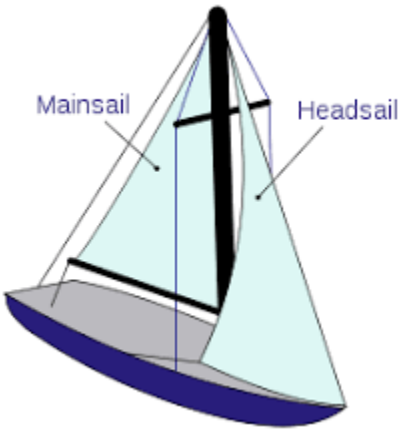
What does the 192 represent? The number of FEET in 2304 inches.
Where do we record this data? In the Feet column.

So what do we know now based on Norma's data and my research data? (*Go over the chart on the BLM.*)

I know that today is Family Fun Game Day, but you will need to finish this assignment first, please. Your job in the Follow-up Lesson before the game will be to determine the height of the highest tree on your campus.

	Unit 5, Lesson 3 **Grades 5-6** **TV Lesson** - continued **----------** **Pirate's Corner** Tell us the height of the tallest tree on your campus! Which state do you think will have the tallest tree? **Objectives** Read through the math and language objectives, making sure that students understand how they accomplished each.

Bermuda Rig Sailboat

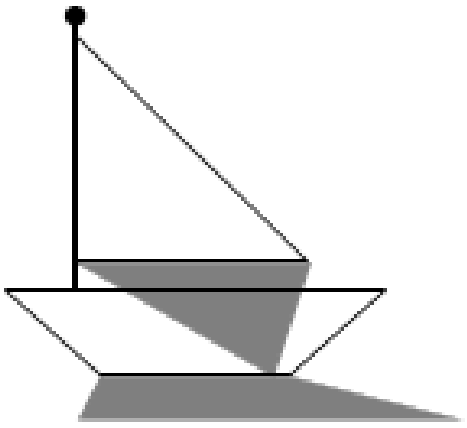


Shadowy Math – Sailboat

Work with your teacher and in groups to complete the table below.

Label Length	Length in Feet (and inches)	Length in inches only
Friend's height		
Friend's Shadow Length		
Bermudan Rig Height		
Bermudan Rig's Shadow Height		

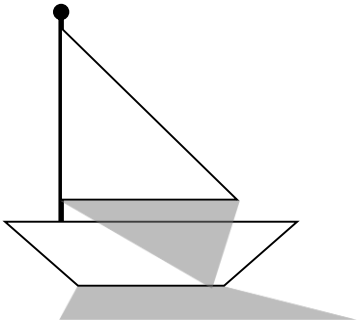
Show your work for the Sail here. Be sure that you label all portions of your ratios.



What does your final answer represent? _____

BLM Unidad 5, TV Lección 3 Matemáticas Sombreadas La Sombra de Veleros

1 por estudiante



Longitud Etiqueta	Longitud en Pies (y pulgadas)	Longitud solo en pulgadas
Altura de un amigo		
Largo de la sombra de un amigo		
Altura de aparejo bermuda		
Altura de la sombra del aparejo bermuda		

Muestra tu trabajo para la Vela aquí. Asegúrate de etiquetar todas las porciones de tus razones.

¿Qué representa tu respuesta final? _____