Mia and Jon's Table (ECR)

Overview

The student will demonstrate the ability to find area using multiplication and tiling on a given rectangle.

Standards

Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

3.MD.C.7 Relate area to the operations of multiplication and addition.

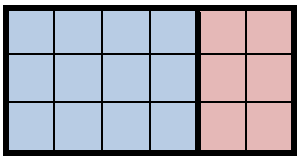
a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that area is the same as would be found by multiplying the side lengths.

c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths *a* and *b* + *c* is the sum of *a* x *b* and *a* x *c*. Use area models to represent the distributive property in mathematical reasoning.

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are pre-requisites for student success with this task's standards.

Grade Level Standard	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
3.MD.C.7a	• 3.MD.C.6	1. The rectangle below has a length of 8 cm and a width of 5 cm. The rectangle will be tiled with tiles that are 1 cm square each. How many tiles would be needed to find the area of the rectangle?  a. 40 square cm tiles 2. What operation could be used to find the area of the rectangle below?  a. Multiplication	• http://learnzillion.com/lessonsets/581-relate-area-to-multiplication-and-addition-using-unit-squares-and-arrays • http://learnzillion.com/lessonsets/378-relate-area-to-multiplication-and-addition-using-arrays-

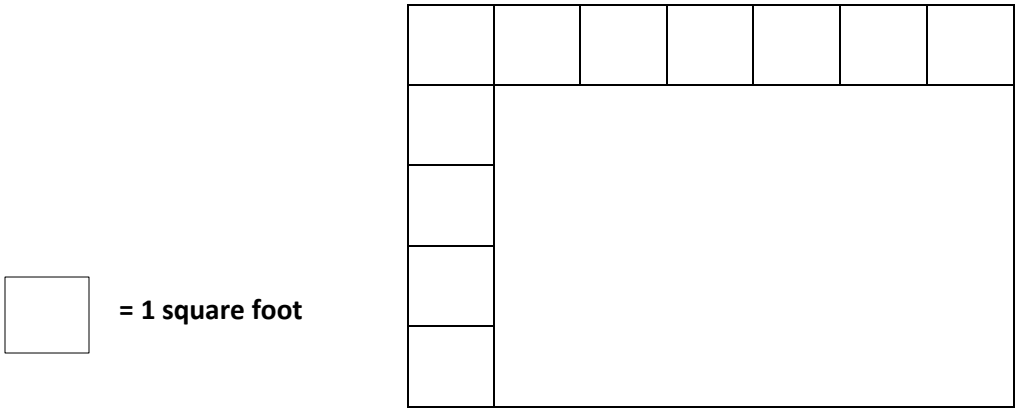
3.MD.C.7c	• 3.MD.C.7b	1. Use an area model with colored tiles to show that the area of a rectangle with a length of 6 units and a width of 3 units can be found by adding the products $(3 \times 2) + (3 \times 4)$. a.  The blue tiles show that 3 x 4 is 12 square units. The red tiles show that 3 x 2 is 6 square units. Together 3 x 6 is 18 square units.	• http://learnzillion.com/lessonsets/758-use-tiling-to-represent-distributive-property • http://learnzillion.com/lessonsets/725-use-tiling-and-area-models-to-represent-the-distributive-property

After the Task:

Students may struggle with part 3 in the task. Ask students to state different pairs of numbers with a sum of 7. Then have students divide the length of the given rectangle to show those different sums. Have students use colored tiles to find the area of the two smaller rectangles and relate that area to the corresponding multiplication facts.

Student Extended Constructed Response

Mia and Jon are trying to find the area of their dining room table below using tiles.



= 1 square foot

1. What is the area of the dining room table in square feet? Draw tiles to complete filling in the area of the rectangle above to prove that your answer is correct.

2. Mia multiplies 5 x 6 to find the area while Jon multiplies 5 x 7 to find the area. Which sibling, Mia or Jon, used the correct expression to find the area? Explain your reasoning.

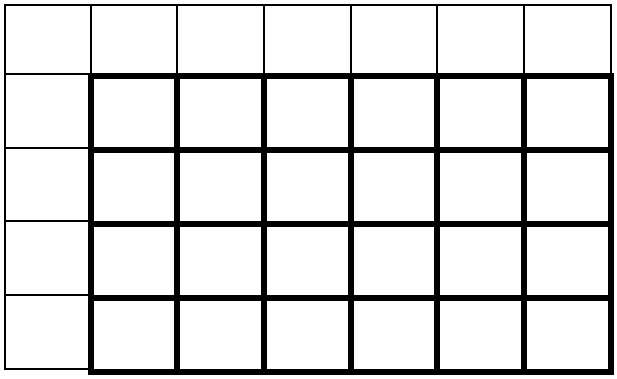
3. Show another way Jon and Mia could have found the area of the dining room table using multiplication and addition. Explain your thinking and use a drawing to support your explanation.

Adapted from http://3-5cctask.ncdpi.wikispaces.net/3.MD.5-3.MD.7 3.MD.7 task 2

Extended Constructed Response Exemplar Response

Mia and Jon are trying to find the area of their dining room table below using tiles.

= 1 square foot



Student should add 24 "tiles" to complete the area for a total of 35 "tiles"

1. What is the area of the dining room table in square feet? Draw tiles to complete filling in the area of the rectangle above to show how you know your answer is correct.

   The area of the dining room table is 35 square feet.

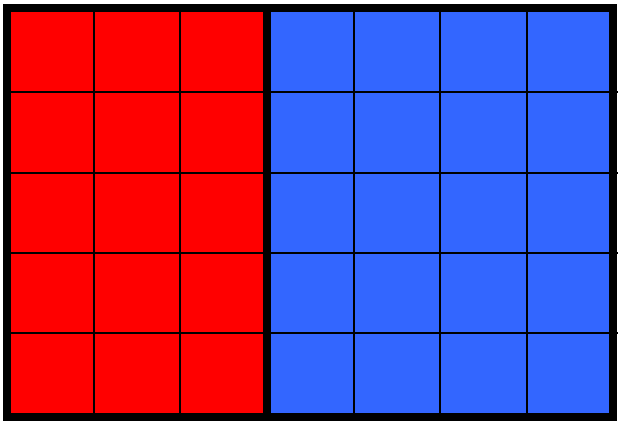
2. Mia multiplies 5 x 6 to find the area while Jon multiplies 5 x 7 to find the area. Which sibling, Mia or Jon, used the correct expression to find the area? Explain your reasoning.

   Jon is correct because he multiplied 5 x 7. The length of the rectangle is 7 feet and the width is 5 feet. To find the area you can multiply 5 x 7, which totals 35 square feet.

3. Show another way Jon and Mia could have found the area of the dining room table using multiplication and addition. Explain your thinking and use a drawing to support your explanation.

   Students could use various multiplication expressions to add together to find the area.

   Sample response: Jon and Mia could divide the rectangle into smaller rectangles. The model below shows the length of 7 as 3 + 4. Then, we could multiply 3 x 5 = 15 to find the area of the rectangle in red and 4 x 5 = 20 to find the area of the rectangle in blue. Finally, add 15 + 20 to find the total area of 35 square units.



Mrs. Jones's Classroom (ECR)

Overview

Students will find the area of different figures by counting square units.

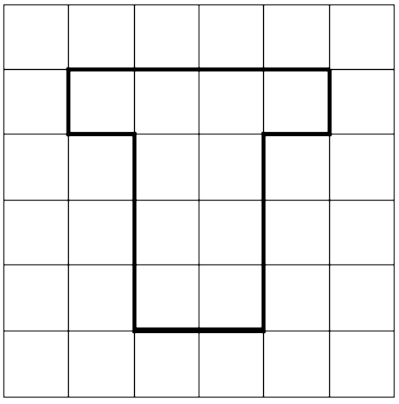
Standards:

Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

3.MD.C.6 Measures areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are pre-requisites for student success with this task's standards.

Grade Level Standard	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
3.MD.C6	• 2.G.A.2	1. What is the area of the figure below?  a. 10 square units 2. http://www.illustrativemathematics.org/illustrations/1515	• http://learnzillion.com/lessonsets/113-measure-area-by-counting-unit-squares

Real-world preparation: The following questions will prepare students for some of the real-world components of this task:

- **What is an arrangement?** An arrangement places things in a particular way. For example, desks in a classroom can be arranged in rows and columns like an array, or they might be arranged in groups, with the groups spread throughout the classroom.
- **What is a floor plan?** A floor plan is a plan of a room or floor of a building drawn to scale as if viewed from above.

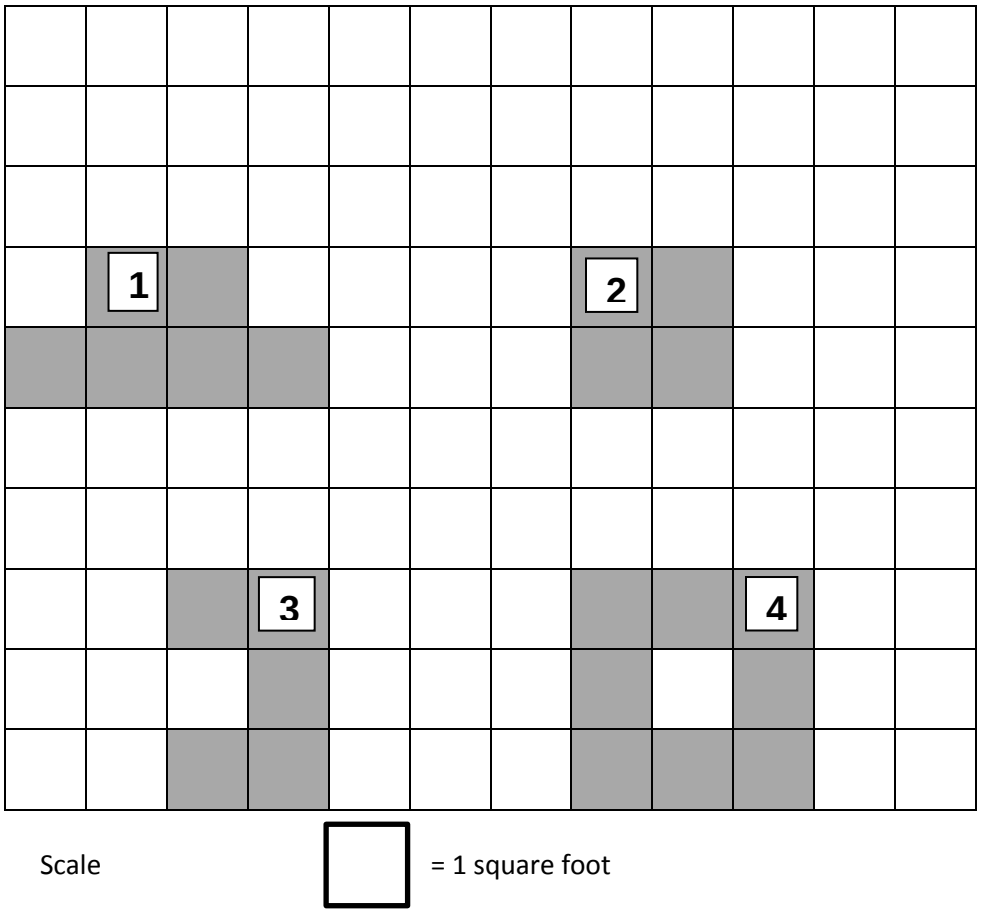
After the Task:

Students may struggle with number 5 of the task. In this case, provide students with a set number of manipulatives and have them create various shapes using all the manipulatives. Next, have them draw the shapes on grid paper. (Sample manipulatives that can be used are Cheez-It® crackers, Starburst® candies, or colored tiles.)

This task will show how area appears in the real world. Have students brainstorm various real-world scenarios in which area would be used (e.g. tiling a floor, covering floor space with a bed or furniture, window panes). Also, have students do a visual search of area-related items in the class (e.g. desktop, window panes, cabinets, ceiling tiles).

Student Extended Constructed Response

Mrs. Jones is trying to find the best way to arrange her students' desks into groups. Below is a floor plan of her classroom showing different arrangements for the groups. Each shaded square represents the placement of one desk.



1. Which of Mrs. Jones's groups has the least area?

2. What is the total area in square feet for group 3?

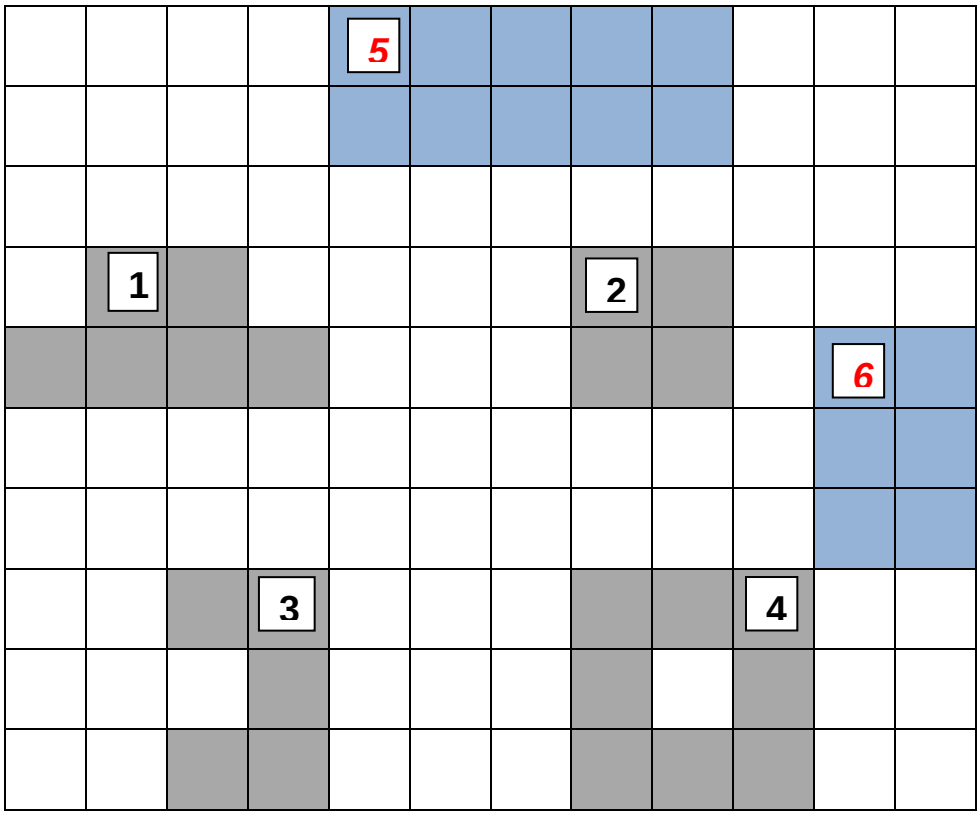
3. William, one of Mrs. Jones's students, looked at the floor plan and said that group 4's desks cover the largest area. Do you agree with William? Explain your thinking.

4. On the floor plan provided above, draw group 5 for Mrs. Jones's class so that it has an area of 10 square feet.

5. On the floor plan provided above, draw group 6 so that it has the same area as group 1 but is arranged in a different way.

Extended Constructed Response Exemplar Response

Mrs. Jones is trying to find the best way to arrange her students' desks into groups. Below is a floor plan of her classroom showing different arrangements for the groups.



Scale = 1 square foot

1. Which of Mrs. Jones's groups has the least area?

   Group 2

2. What is the total area in square feet for group 3?

   5 square feet (students do not need to include the units)

3. William, one of Mrs. Jones's students, looked at the floor plan and said that group 4's desks cover the largest area. Do you agree with William? Explain your thinking.

   William is correct because group 4 has an area of 8 square units. Group 4 covers more area than groups 1, 2, and 3.

4. On the floor plan provided above, draw group 5 for Mrs. Jones's class so that it has an area of 10 square feet.

   See the squares shaded in blue on the grid above. Students may have different arrangements; they must have the correct number of squares in the group they drew.

5. On the floor plan provided above, draw group 6 so that it has the same area as group 1 but is arranged in a different way.

   See the squares shaded in blue on the grid above. Students may have different arrangements; they must have the correct number of squares in the group they drew.

Kim's Candy Bar (ECR)

Overview

This task requires students to understand that a fraction is a part of a whole, to show equal fractions on a number line, and to explain their reasoning.

Standards:

Develop understanding of fractions as numbers.

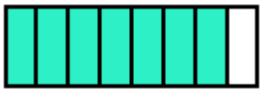
3.NF.A.1 Understand a fraction 1/*b* as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction *a*/*b* as the quantity formed by *a* parts of size 1/*b*.

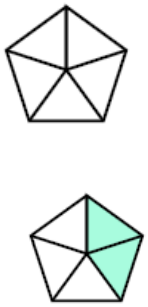
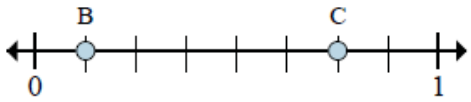
3.NF.A.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.

a. Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size 1/*b* and that the end point of the part based at 0 locates the number 1/*b* on the number line.
b. Represent a fraction *a*/*b* on a number line diagram by marking off *a* lengths 1/*b* from 0. Recognize that the resulting interval has size *a*/*b* and that its end point locates the number *a*/*b* on the number line.

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are pre-requisites for student success with this task's standards.

Grade Level Standard	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
3.NF.A.1	• 2.MD.A.2 • 2.G.A.3	1. Write a fraction that represents the shaded portion of the rectangle below.  a. $\frac{7}{8}$ 2. Shade the figure below to represent the	• http://www.illustrativemathematics.org/illustrations/827 • http://www.illustrativemathematics.org/illustrations/826 • http://learnzillion.com/lessonsets/89-understand-a-fraction-1b-as-part-of-a-whole-partitioned-into-b-equal-parts • http://learnzillion.com/lessonsets/79-understand-fractions

Grade Level Standard	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
		fraction $\frac{2}{5}$.  a. 3. http://www.illustrativemathematics.org/illustrations/833	
3.NF.A.2	• 2.MD.B.6	Use the number line below to answer the two questions.  1. What is the location of B written as a fraction? a. $\frac{1}{8}$ 2. What is the location of C written as a fraction? a. $\frac{6}{8}$ 3. http://www.illustrativemathematics.org/illustrations/168 4. http://www.illustrativemathematics.org/illustrations/1350	• http://www.illustrativemathematics.org/illustrations/1081 • http://learnzillion.com/lessonsets/334-represent-fractions-on-a-number-line • http://learnzillion.com/lessonsets/80-fractions-on-number-lines

After the Task:

If a student struggles with identifying fractions as parts of a whole, provide him or her with manipulatives to use in dividing wholes into equal parts and identifying parts of a whole as well as total pieces needed to make a whole. (Possible manipulatives could include an actual candy bar, a picture of a candy bar that they can cut and label, graham crackers that can be broken into equal pieces, or pictures of pizzas, pies, etc.)

Student Extended Constructed Response

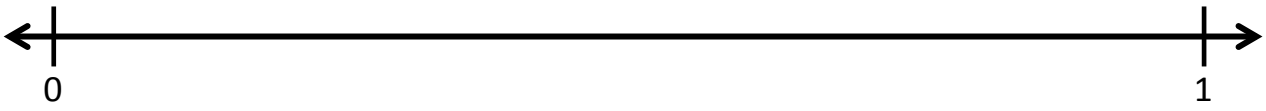
Kim wants to share a candy bar between herself and 5 of her friends after cheerleading practice.

1. Use the rectangle below to show how Kim could divide her candy bar so that each person gets an equal share.

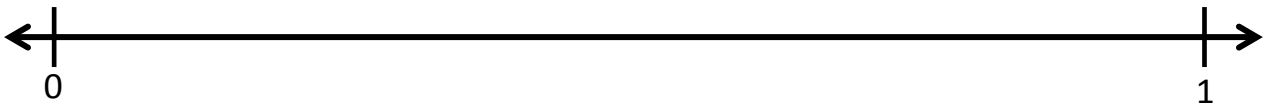
2. Write a fraction that would represent one piece of the candy bar.

3. Explain what the fraction $\frac{5}{6}$ means in terms of the candy bar.

4. Two friends were not at practice so Kim only shared $\frac{4}{6}$ of her candy bar. Show where $\frac{4}{6}$ would be located on the number line below.



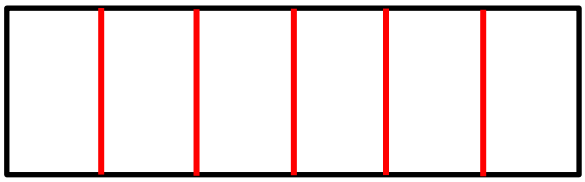
5. The next day Kim brought another candy bar and only shared it with 2 friends. Kim and her two friends each got an equal share. Show what fraction of the candy bar Kim kept for herself using the number line below.



Extended Constructed Response Exemplar Response

Kim wants to share a candy bar between herself and 5 of her friends after cheerleading practice.

1. Use the rectangle below to show how Kim could divide her candy bar so that each person gets an equal share.



2. Write a fraction that would represent one piece of the candy bar.

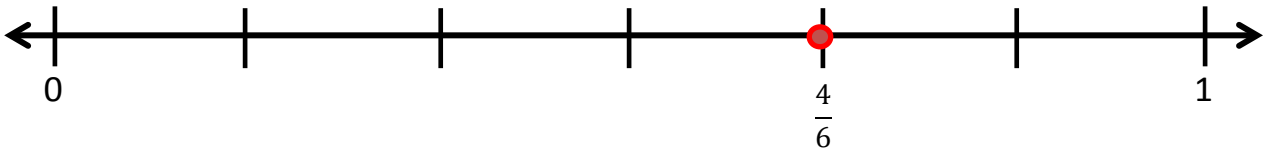
$$\frac{1}{6}$$

3. Explain what the fraction $\frac{5}{6}$ means in terms of the candy bar.

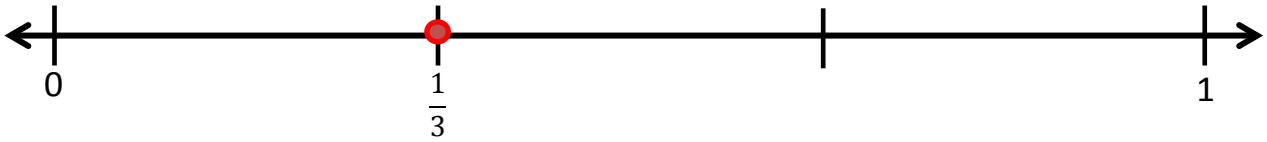
   The fraction $\frac{5}{6}$ means that there are 5 of the pieces that are $\frac{1}{6}$ of the candy bar.

   Also accept: $\frac{5}{6}$ means there are 5 of the 6 pieces of the candy bar; or $\frac{5}{6}$ is the portion of the candy bar Kim plans to share.

4. Two friends were not at practice so Kim only shared $\frac{4}{6}$ of her candy bar. Show where $\frac{4}{6}$ would be located on the number line below.



5. The next day Kim brought another candy bar and only shared it with 2 friends. Kim and her two friends each got an equal share. Show what fraction of the candy bar Kim kept for herself using the number line below.



Planting Flowers (ECR)

Overview

Students will solve word problems involving multiplication and division.

Standards

Represent and solve problems involving multiplication and division.

3.OA.A.1 Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 x 7.*

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

Multiply and divide within 100.

3.OA.C.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two 1-digit numbers.

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are pre-requisites for student success with this task's standards.

Grade Level Standard	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
3.OA.A.1	• 2.OA.C.3 • 2.OA.C.4	1. Write a sentence that could be represented by the expression 5 x 8 based on the number of stickers Sophia received from friends. a. Sophia received 5 stickers from each of 8 friends. OR Sophia received 8 stickers from each of 5 friends.	• http://www.illustrativemathematics.org/illustrations/620 • http://www.illustrativemathematics.org/illustrations/3 • http://learnzillion.com/lessonsets/395-interpret-products-of-whole-numbers-using-pictures-arrays-and-number-lines • http://learnzillion.com/lessonsets/379-interpret-products-of-whole-numbers-and-model-multiplication-using-arrays-pictures-and-equations • http://learnzillion.com/lessonsets/273-interpret-products-of-whole-numbers
3.OA.A.3	• 3.OA.A.1	1. Kenya bought 6 small picture frames. Each picture frame cost $3. How much	• http://learnzillion.com/lessonsets/611-solve-multiplication-and-division-word-problems

Grade Level Standard	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
		did Kenya spend on the picture frames? Write an equation to show how you found your answer. a. 6 x $3 = $18; she spent $18. 2. Jaleel arranged a classroom into 4 rows of 7 desks. How many total desks were in the arrangement? a. There were 28 desks in all. 3. http://www.illustrativemathematics.org/illustrations/365 4. http://www.illustrativemathematics.org/illustrations/262	• http://learnzillion.com/lessonsets/303-solve-word-problems-with-multiplication-and-division
3.OA.C.7	• 3.OA.B.5 • 3.OA.B.6	1. What is 4 x 6? a. 24 2. What is 8 x 7? a. 56	• http://learnzillion.com/lessonsets/396-multiply-and-divide-within-100 • http://learnzillion.com/lessonsets/302-multply-and-divide-within-100

Real-World Preparation: The following questions will prepare students for some of the real-world components of this task:

- **What is a garden?** A piece of ground, often near a house, used for growing flowers, fruit, or vegetables.
- **What is a tulip?** A spring-flowering plant of the lily family, with boldly colored cup-shaped flowers.

After the Task:

The students may struggle with the concept of applying money to a multiplication problem. If this is the case provide students with paper money to use with problem solving that involves money. If students struggle with changing the array in step 2b, provide manipulatives to model an array and then add to the array to show changes to the equation by adding rows or columns.

Student Extended Constructed Response

Jenny is planting a spring flower garden. The table below shows the plants she wants to purchase for her garden and the price for each plant.

Plant	Tulip 	Daisy 	Rose 
Price	$3.00	$2.00	$4.00

1. Jenny bought 6 rose plants. How much money did she spend? Write an equation to show how you found your answer.

2. A model of a part of Jenny's garden is shown below.

   a. Jenny wrote the equation $2 \times 3 = \square$ to represent the number of tulip plants she planted in her garden. Explain what the equation means based on the model above.

   b. Draw a new model to show how your array would change if Jenny added 2 more tulip plants to **each row**. How many tulip plants would Jenny have in her garden based on your model?

3. Jenny spent $18.00 on daisy plants. How many daisy plants did she buy? Show how you found your answer using an equation with a symbol for the unknown number.

4. If Jenny had $12.00 to spend, show 3 possible combinations of plants that Jenny could buy if she spent all $12.00 with no money left over. Make sure to include equations using multiplication or division for each combination.

Combinations	Equation

Extended Constructed Response Exemplar Response

Jenny is planting a spring flower garden. The table below shows the plants she wants to purchase for her garden and the price for each plant.

Plant	Tulip 	Daisy 	Rose 
Price	$3.00	$2.00	$4.00

1. Jenny bought 6 rose plants. How much money did she spend? Write an equation to show how you found your answer.

   Jenny spent $24.00.

   6 x $4.00 = $24.00

2. A model of a part of Jenny's garden is shown below.

   a. Jenny wrote the equation $2 \times 3 = \square$ to represent the number of tulip plants she planted in her garden. Explain what the equation means based on the model above.

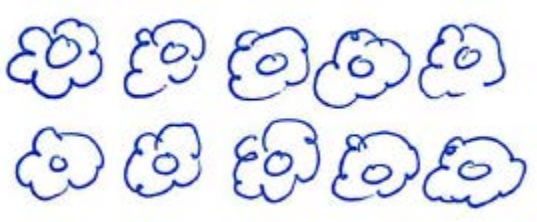
      The equation means she has 2 rows of 3 tulip plants in each row.

      OR

      The equation means she has 3 groups of 2 tulip plants.

b. Draw a new model to show how your array would change if Jenny added 2 more tulip plants to **each row**. How many tulip plants would Jenny have in her garden based on your model?

Jenny would have 10 tulip plants in her garden.



3. Jenny spent $18.00 on daisy plants. How many daisy plants did she buy? Show how you found your answer using an equation with a symbol for the unknown number.

$$\$2 \times \square = \$18$$

I know that 2 x 9 = 18 so Jenny bought 9 daisy plants.

***Note: Students may use different equations. Any equation that correctly relates the values 2 and 18 with a symbol (or letter) representing the unknown amount should be considered correct.*

4. If Jenny had $12.00 to spend, show 3 possible combinations of plants that Jenny could buy if she spent all $12.00 with no money left over. Make sure to include equations using multiplication or division for each combination.

Combinations	**Equation**
Jenny can buy 4 tulip plants	*4 x $3 = $12*
Jenny can buy 2 tulip plants and 3 daisy plants.	*2 x $3 = $6* *3 x $2 = $6* *$6 + $6 = $12*
Jenny can by 2 tulip plants, 1 daisy plant, and 1 rose plant.	*2 x $3 = $6* *1 x $2 = $2* *1 x $4 = $4* *$6 + $2 + $4 = $12*

***Note: There are many different combinations students can make with the given amounts. Students must have equations to show that their combinations will cost $12.*

Going to the Fair (ECR)

Overview

Students will use multiplication and division to solve problems involving a family that has gone to a fair. Students will also create a picture graph to show how much money the family spent on various rides and games.

Standards

Represent and solve problems involving multiplication and division.

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

3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = □ ÷ 3, 6 × 6 = ?*

Understand properties of multiplication and the relationship between multiplication and division.

3.OA.B.5 Apply properties of operations as strategies to multiply and divide. *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known (commutative property of multiplication). 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30 (associative property of multiplication). Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56 (distributive property).*

Multiply and divide within 100.

3.OA.C.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two 1-digit numbers.

Solve problems involving the four operations, and identify and explain patterns in arithmetic.

3.OA.D.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

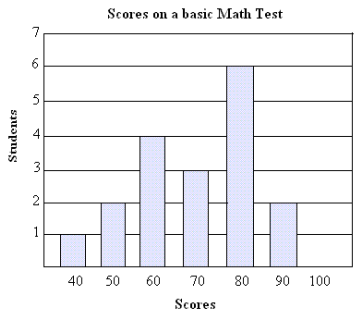
Represent and interpret data.

3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are pre-requisites for student success with this task's standards.

Grade Level Standard	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
3.OA.A.3	• 3.OA.A.1 • 3.OA.A.2	1. Levi bought 3 candy bars. Each candy bar cost $2. How much money did Levi spend on candy bars? a. Levi spent $6 on candy bars. 2. http://www.illustrativemathematics.org/illustrations/344 3. http://www.illustrativemathematics.org/illustrations/365	• http://www.illustrativemathematics.org/illustrations/1531 • http://learnzillion.com/lessonsets/611-solve-multiplication-and-division-word-problems
3.OA.A.4		1. What is the value of ◆ in the equation 5 x ◆ = 35? a. 7 2. What is the value of ◆ in the equation 8 = ◆÷ 6? a. 48 3. http://www.illustrativemathematics.org/illustrations/1814	• http://learnzillion.com/lessonsets/304-determine-unknown-whole-numbers-in-multiplication-or-division-equations
3.OA.B.5	• 3.OA.A.1 • 3.OA.A.2	1. Rewrite the expression $(6 \times 3) + (6 \times 5)$ as the product of two numbers. a. 6×8	• http://www.illustrativemathematics.org/illustrations/1540 • http://learnzillion.com/lessonsets/226-apply-properties-of-operations-as-strategies-to-multiply-and-divide
3.OA.C.7	• 3.OA.B.5 • 3.OA.B.6	1. If you know $7 \times 3 = 21$, write another equation with 3, 7, and 21 that is also true. a. $3 \times 7 = 21$ or $21 \div 7 = 3$ or $21 \div 3 = 7$. 2. Find 9×8. a. 72	• http://learnzillion.com/lessonsets/396-multiply-and-divide-within-100 • http://learnzillion.com/lessonsets/302-multply-and-divide-within-100
3.OA.D.8	• 2.OA.A.1 • 3.OA.A.3	1. Johanna bought some hot dogs and some drinks at the fair. She paid $17.00 for all of the items she bought. She paid $8.00 for the drinks. How much did each hot dog cost? a. $3.00 2. http://www.illustrativemathematics.org/illustrations/13 3. http://www.illustrativemathematics.org/illustrations/1301	• http://www.illustrativemathematics.org/illustrations/1 • http://learnzillion.com/lessonsets/318-solving-two-step-word-problems-including-those-with-unknown-quantities
3.MD.B.3	•	1. Use the bar graph below to answer the questions that follow.	• http://learnzillion.com/lessonsets/655-draw-scaled-picture-and-bar-graphs

Grade Level Standard	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
		 a. How many more students scored an 80 than those students that scored a 50 on the test? i. 4 students b. How many students took the test? i. 18 students	• http://learnzillion.com/lessonsets/569-answer-questions-using-information-in-scaled-picture-and-bar-graphs

Real-World Preparation: The following questions will prepare students for some of the real-world components of this task:

- **What is a fair?** A fair is a local event where there are rides and games for people to enjoy. The fair usually celebrates some aspect of the community and allows many people to highlight talents.

After the Task:

- In problems where students are asked to write equations to show how the problem was solved, be sure students are using the equal sign correctly. Some students may write expressions only. Remind students about the difference between equations and expressions and have them write the correct equations for each of the problems given.
- **For problem 1c**, students may not see the structure in the expressions they used for parts a and b. Provide struggling students with additional practice on the distributive property.
- **For problem 3**, students may include the amount of money Angelica received from her grandmother in their calculations. Have students read the problem carefully and identify key phrases, and ask them how they can represent those phrases mathematically.
- **For problem 7**, students may have difficulty deciding on a scale to use to create the graph of the amount of money spent. Be sure that students are using the information from Part II to find the amount of money spent. Students will have to use a picture or symbol that represents more than one dollar to be able to fit the graph on the grid that is provided. Provide struggling students with extra practice reading and creating picture graphs that have a variety of scales.

Student Extended Constructed Response

Part I:

A grandmother, Ms. Grayson, is taking her adult children and her grandchildren to the fair, where they will play games and go on rides.

1. Tickets to go into the fair cost $4 for each person. Ms. Grayson paid for her 5 grandchildren, her 2 adult daughters, and herself, to go into the fair.

    a. How much did Ms. Grayson spend on her grandchildren's tickets? Write an equation to show how you solved the equation.

    b. How much did Ms. Grayson spend on adult tickets? Write an equation to show how you solved the equation.

    c. Using the equations you wrote in parts a and b, write a new equation to show the total amount Ms. Grayson paid for tickets to go into the fair.

    (___ × ___) + (___ × ___) = ___ × ___

    d. What is the total amount Ms. Grayson spent on tickets?

2. Ms. Grayson gave a total of $45 to her 5 grandchildren for games and rides. Each grandchild received the same amount of money. How much money did each grandchild receive? Write two different equations that would be used to solve this problem.

Part II:

At the fair, Ms. Grayson's grandchildren can choose how to spend their money. Use the chart of game and ride prices to answer questions 3-6.

Game and Ride Prices *Note: Prices are for 1 ride or game*	
Bumper Cars	$3
Ferris Wheel	$2
High Swings	$4
Ring Toss	$1
Basketball Toss	$2

3. Angelica, one of Ms. Grayson's grandchildren, brought some money from home. Together with the money her grandmother gave her, she has $12. She decides to spend her money on riding the bumper cars as many times as she can. What is the greatest number of times Angelica can ride the bumper cars, using the money she has?

4. Jackson spent some of his money riding the Ferris wheel. He spent $6 on the Ferris wheel. Use the equation $2 × f = $6 to determine how many times Jackson rode the Ferris wheel. What does f represent?

5. Ms. Lind, who is Ms. Grayson's adult daughter, paid for everyone in their family who is at the fair (the 5 children, Ms. Grayson, her sister, and herself) to play ring toss twice. How much did Ms. Lind pay for each person to play ring toss twice? Use models, pictures, equations, or words to show how you found your answer.

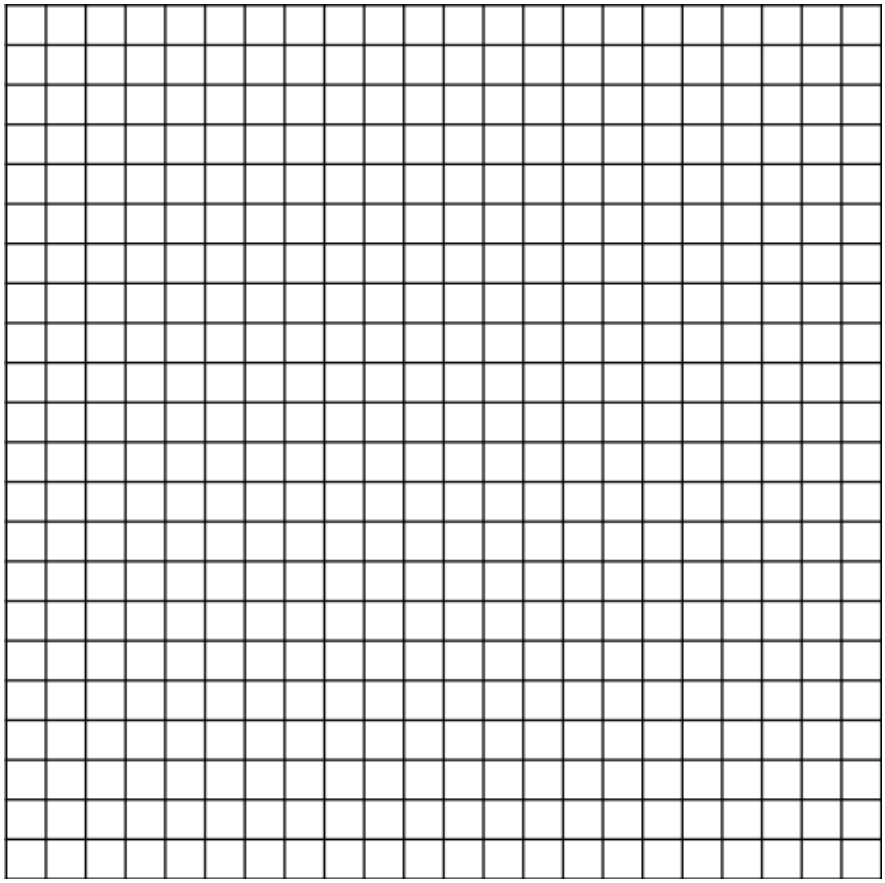
6. Ms. Westin, Ms. Grayson's other adult daughter, paid for different family members to have rides on the high swings. If she spent $40, how many rides did she pay for? Show or explain how you found your answer.

Part III

Ms. Grayson counted the number of times that someone in her family rode each ride or played each game.

- Number of bumper car rides: 8
- Number of Ferris wheel rides: 6
- Number of high swing rides: 10
- Number of ring toss games: 16
- Number of basketball toss games: 9

7. Using the information Ms. Grayson collected and the prices of the games and rides from Part II, create a picture graph that shows the amount of **money** the family spent on each game or ride. Remember to label your graph and provide a key.



8. Use the picture graph you created in question 7 to answer the following:
    a. How much more money was spent on the high swings than the bumper cars? Write an equation to show how you found your answer.

    b. How many more games of ring toss would have to be played in order for the family to have spent the same amount of money as they spent on basketball toss? Explain how you found your answer.

Extended Constructed Response Exemplar Response

Part I:

A grandmother, Ms. Grayson, is taking her adult children and her grandchildren to the fair, where they will play games and go on rides.

1. Tickets to go into the fair cost $4 for each person. Ms. Grayson paid for her 5 grandchildren, her 2 adult daughters, and herself, to go into the fair.

    a. How much did Ms. Grayson spend on her grandchildren's tickets? Write an equation to show how you solved the equation.

    $\$4 \times 5 = ?$ *Ms. Grayson spent $20 on children's admittance.*

    b. How much did Ms. Grayson spend on adult tickets? Write an equation to show how you solved the equation.

    $\$4 \times 3 = ?$ *Ms. Grayson spent $12 on adult admittance.*

    c. Using the equations you wrote in parts a and b, write a new equation to show the total amount Ms. Grayson paid for tickets to go into the fair.

    $$(\$4 \times 5) + (\$4 \times 3) = \$4 \times 8$$

    d. What is the total amount Ms. Grayson spent on tickets?

    Ms. Grayson spent a total of $32 on tickets to the fair.

2. Ms. Grayson gave a total of $45 to her 5 grandchildren for games and rides. Each grandchild received the same amount of money. How much money did each grandchild receive? Write two different equations that would be used to solve this problem.

    $\$45 \div 5 = m$ *or* $5 \times m = \$45$

    Ms. Grayson gave each of her grandchildren $9.

Part II:

At the fair, Ms. Grayson's grandchildren can choose how to spend their money. Use the chart of game and ride prices to answer questions 3-6.

Game and Ride Prices *Note: Prices are for 1 ride or game*	
Bumper Cars	$3
Ferris Wheel	$2
High Swings	$4
Ring Toss	$1
Basketball Toss	$2

3. Angelica, one of Ms. Grayson's grandchildren, brought some money from home. Together with the money her grandmother gave her, she has $12. She decides to spend her money on riding the bumper cars as many times as she can. What is the greatest number of times Angelica can ride the bumper cars, using the money she has?

   The greatest number of times Angelica can ride the bumper cars is 4 times.

4. Jackson spent some of his money riding the Ferris wheel. Jackson spent $6 on the Ferris wheel. Use the equation $\$2 \times f = \$6$ to determine how many times Jackson rode the Ferris wheel. What does *f* represent?

   f represents the number of times Jackson can ride the Ferris wheel. He can ride the Ferris wheel 3 times.

5. Ms. Lind, who is Ms. Grayson's adult daughter, paid for everyone in their family who is at the fair (the 5 children, Ms. Grayson, her sister, and herself) to play ring toss twice. How much did Ms. Lind pay for each person to play ring toss twice? Use models, pictures, equations, or words to show how you found your answer.

   5 children + 3 adults = 8 people

   $\$1 \times 8\ people = \$8$ *for one game.*

   $\$8 \times 2\ games = \$16$ *for two games.*

   ***Note: Students may use different equations or drawings to show how they found the answer.*

6. Ms. Westin, Ms. Grayson's other adult daughter, paid for rides on the high swings. If she spent $40, how many rides did she pay for? Show or explain how you found your answer.

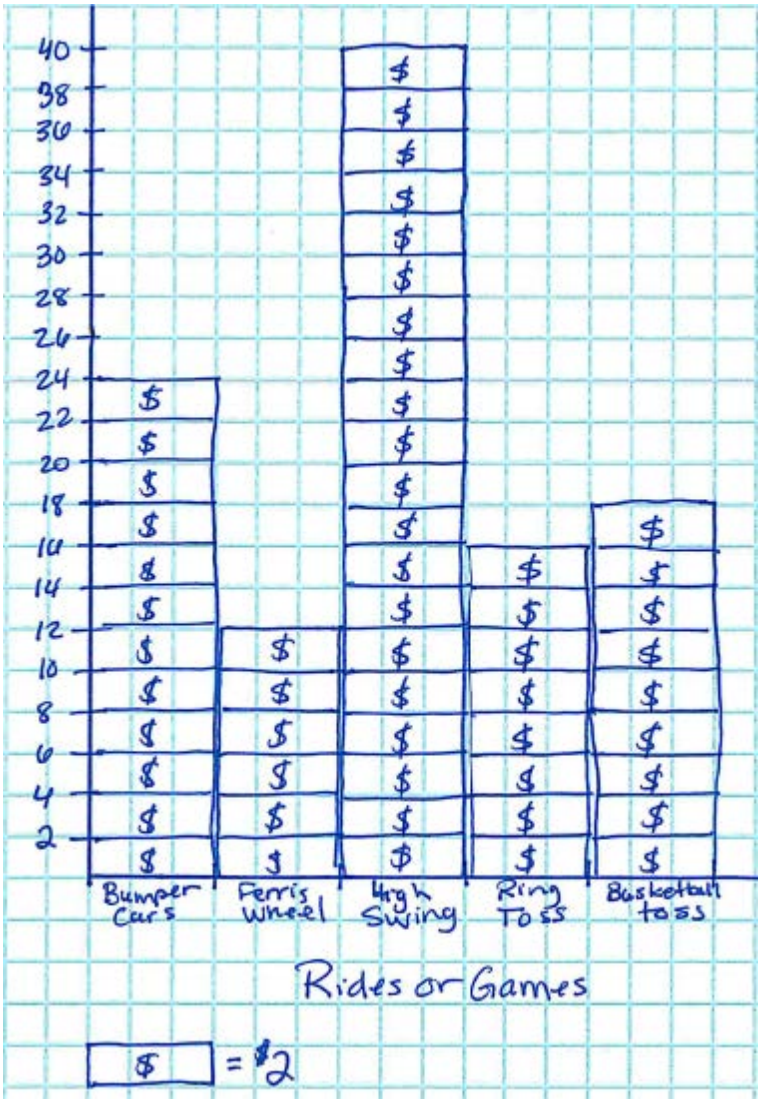
   It costs $4 to ride the high swings one time and I know that 4 x 10 = 40, so Ms. Westin paid for 10 rides on the high swings.

Part III

Ms. Grayson counted the number of times that someone in her family rode each ride or played each game.

- Number of bumper car rides: 8
- Number of Ferris wheel rides: 6
- Number of high swing rides: 10
- Number of ring toss games: 16
- Number of basketball toss games: 9

7. Using the information Ms. Grayson collected and the prices of the games and rides from Part II, create a picture graph that shows the amount of **money** the family spent on each game or ride. Remember to label your graph and provide a key.



Students may use a different scale for the graph. The graph should be labeled and scaled appropriately.

8. Use the picture graph you created in question 7 to answer the following:

    a. How much more money was spent on the high swings than the bumper cars? Write an equation to show how you found your answer.

    $40 - $24 = $16

    They spent $16 more on high swings than bumper cars.

    b. How many more games of ring toss would have to be played in order for the family to have spent the same amount of money as they spent on basketball toss? Explain how you found your answer.

    They spent $18 on basketball toss and $16 on ring toss. I subtracted 18-16 and found that they spent $2 more on basketball toss. Since ring toss costs $1 per game, they will have to play 2 more games of ring toss to spend the same amount as on basketball.