Unit 6.1, Lesson 3: Exploring Parallelograms

Answer Key

Warm-Up

Responses vary.

- The top-left shape doesn't belong because it's not a parallelogram.
- The top-right shape doesn't belong because it doesn't have a line of symmetry.
- The bottom-left shape doesn't belong because it doesn't have any slanted sides.
- The bottom-right shape doesn't belong because it's the only one that is a square.

Activity 1: Area Strategies

Parallelogram	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*
Area (sq. units)	18	20	20	18	18	20	20	30	24

Are You Ready for More?

Parallelograms vary.

Activity 1 Synthesis

1. *Strategies vary*. I cut the parallelogram vertically and rearranged the pieces to make a rectangle with sides of 4 units and 5 units.
2. *Responses vary depending on strategy.*
3. *Strategies vary*. My classmate cut a triangle off the parallelogram and moved it so it was a rectangle. Then the area is base times height of the rectangle.

Activity 2 Warm-Up

Responses vary.

- I notice Deja cut her parallelogram and rearranged the pieces into a rectangle. I wonder if I can always rearrange the pieces of a parallelogram into a rectangle.
- I notice Deja and Gabriela found the area of the same parallelogram. I wonder if there is always more than one way to find the area.

Activity 2: Deja's and Gabriela's Strategies

1. *Responses vary*.
   - Deja drew a vertical line to split the shape into two pieces. Then she slid the triangle to the right to make one rectangle with an area of $4 \cdot 5 = 20$ square units.
   - Gabriela drew a rectangle around the parallelogram and subtracted the area of the two triangles from the whole rectangle.
2. *Responses vary.*
   - Both Deja and Gabriela used rectangles to help them find the area of the parallelogram. Deja cut the parallelogram into pieces to help her find the area and Gabriela didn't.

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Unit 6.1, Lesson 3: Exploring Parallelograms **Answer Key**

- You can almost always cut a parallelogram and rearrange the pieces to make a rectangle.
- You can't use Deja's strategy for parallelogram D because no matter where you make a vertical cut, the pieces won't make a rectangle. You can use Gabriela's strategy.
- A tilty parallelogram with sides that are all slanted would be very hard to find the area of.

Activity 3: Base, Height, and Area

1. *Responses vary*.
   - Base: The base is any side of the parallelogram.
   - Height: The height is the shortest distance from the base of the parallelogram to the opposite side. It is perpendicular to the base.
2.

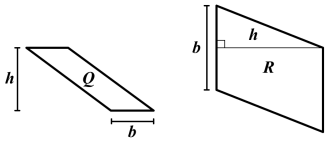
Parallelogram	Base (units)	Height (units)	Area (sq. units)
A	3	6	18
B	4	5	20
C	4	5	20
D	3	6	18
All parallelograms	b	h	$b \times h$

3. *Responses vary*. $A = b \times h$.

4. $A = 7 \times 2$ or 14 square units
   $A = 30 \times 20$ or 600 square units

Lesson Synthesis

1. *Responses vary.*



2. *Responses vary*. You can find the area of a parallelogram by multiplying a base and a height.

Cool-Down

Parallelogram	Base (units)	Height (units)	Area (sq. units)
S	3	4	12
T	2	3	6

Unit 6.1, Lesson 5: Exploring Triangles

Answer Key

Warm-Up

1. Area = 12 square units
2. *Responses vary.*
   - I counted the number of squares that are shaded.
   - I made a rectangle around triangle A and calculated the area and then divided by 2 since the triangle is half of the area of the rectangle.

Activity 1: Area Strategies

1. 12 square units
2. *Responses vary depending on strategy.*

Activity 2: Lots of Triangles

1.

Triangle	C	D	E	F	G	H
Area (sq. units)	9	17.5	10	15	9	7.5

2. *Responses vary.* Make a rectangle around the triangle, find its area, and then divide by 2.

Are You Ready for More?

Triangles vary.

Lesson Synthesis

Responses vary.

- Hamza made a rectangle around the triangle and saw that the triangle's area is half of the rectangle area.
- Madison rotated the triangle to make a parallelogram and then calculated its area and divided by 2.

Cool-Down

1. 6 square units
2. *Responses vary.*
   - I made a rectangle around the triangle and calculated the area and then divided by 2.
   - I added a rotated triangle to make a parallelogram and then calculated its area and divided by 2.

Unit 6.1, Lesson 11: Nothing But Nets

Answer Key

Warm-Up

1. B
2. C
3. D
4. A

Activity 1: Name Them

1.

Name	Letter	Base Shape
Triangular prism	D	triangle
Triangular pyramid	C	triangle
Square prism	A	square
Rectangular prism	B	rectangle

2. Rectangular pyramid or square pyramid

Activity 2: Make Them

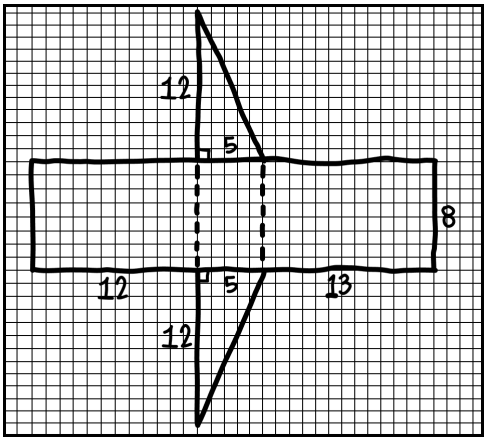
Polyhedron A: Rectangular prism Surface Area: 82 square units

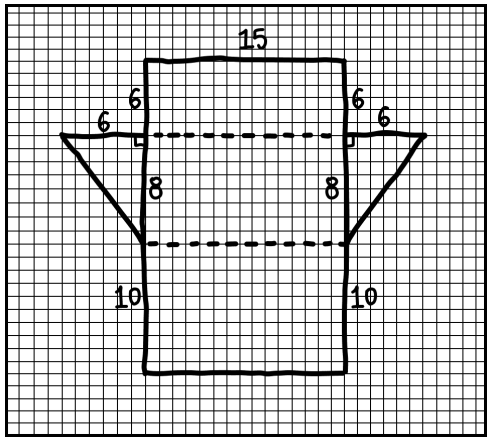
Polyhedron B: Rectangular pyramid or square pyramid Surface Area: 48 square units

Polyhedron C: Triangular prism Surface Area: 48 square units

Are You Ready for More?

Responses vary. Sample nets:





Lesson Synthesis

Responses vary. A net helps you calculate the surface area of a polyhedron by making it so you can make sure you see every side and picture their shapes.

Cool-Down

1. Triangular prism
2. 72 square units

Unit 6.1, Lesson 3: Take It To Go

Answer Key

Warm-Up

Responses vary.

1. The patterns are similar because they both are flat and need to be folded to be useful. The patterns are different because one has a square base and the other has a triangular base.
2. I would prefer container A to hold a bagel because it looks like it would fit better.
3. I think container B requires more material because it includes a lid.

Activity 1: Design a Container

Responses vary. See Teacher Presentation Screens 3 and 4 for examples of a 3-D sketch and a pattern for different containers.

Activity 2: Make It!

Responses vary.

Are You Ready for More?

Responses vary.

Dear DeAndre, I researched aluminum and PLA corn plastic as possible materials for take-out containers. I think you should use aluminum because it is recyclable and affordable. PLA corn plastic is a plant-based material that is compostable but is made from GMO corn through industrial agriculture, which is harmful to the environment.

Lesson Synthesis

1. *Responses vary.* I calculated the surface area when I figured out how much material I needed to create my container
2. If I had more time, I would like to make my container hold the same volume but have a smaller surface area so that it uses less material.

Cool-Down

Pattern #1 uses more material.

Explanations vary.

- Pattern #1 uses about 154 square inches of material while pattern #2 uses about 85 square inches of material.
- The bases in pattern #2 are less than half of the area of the bases in pattern #1. Pattern #2 also only has 3 rectangles, while pattern #1 has 4 rectangles.

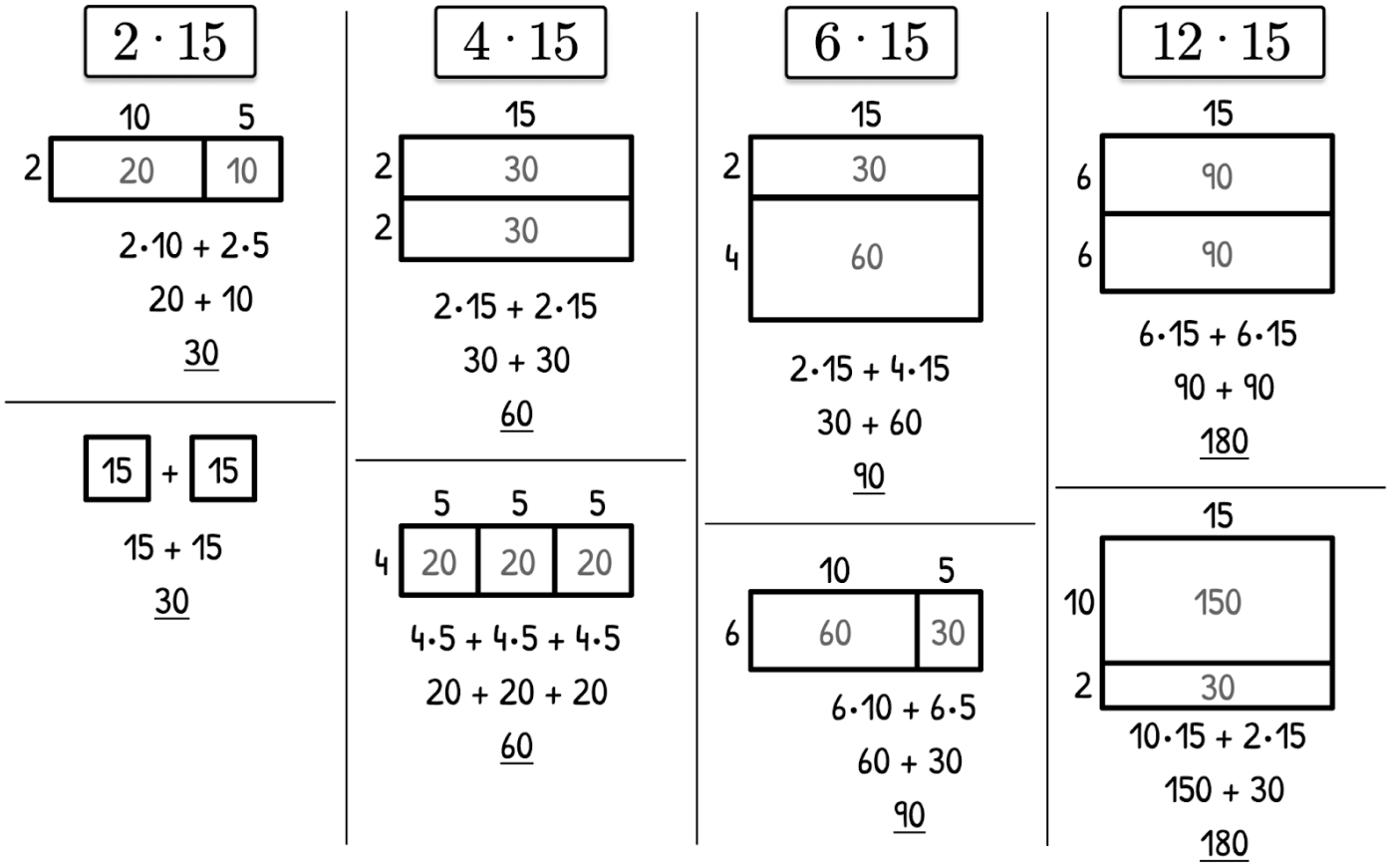
Unit 6.2, Lesson 2: Ratio Rounds

Answer Key

Warm-Up (Projection Sheet)

1. 30
2. 60
3. 90
4. 180

Strategies Students Might Use in the Number Talk



Activity 1: Ratio Rounds

Rounds 1–3

Responses vary.

Intermission

Responses vary.

- 1 mushroom for every slice of pizza.
- The ratio of pepperoni to pizzas is 16 to 2.
- Mushrooms : pepperoni is 1 : 2.

Activity 2: Two Truths and a Lie

1. A
2. C
3. *Responses vary.*
4. *Responses vary.*

Lesson Synthesis

1. *Responses vary.*
   - 3 moons for every 6 stars.
   - The ratio of stars to moons is 4 to 2.
   - Moons : stars is 1 : 2.
2. *Responses vary.*

Cool Down

✓ The ratio of clouds to hearts is 6 to 4.

✓ For every 3 clouds there are 2 hearts.

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Unit 6.2, Lesson 3: Rice Ratios

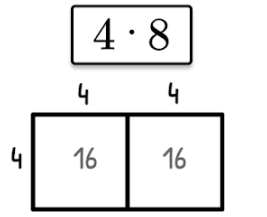
Answer Key

Warm-Up (Projection Sheet)

1. 32
2. 40
3. 72
4. 120
5. 152

Strategies Students Might Use in the Number Talk

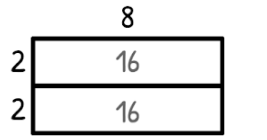
$4 \cdot 8$



$4 \cdot 4 + 4 \cdot 4$

$16 + 16$

32

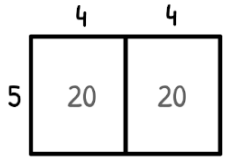


$2 \cdot 8 + 2 \cdot 8$

$16 + 16$

32

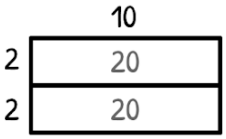
$4 \cdot 10$



$5 \cdot 4 + 5 \cdot 4$

$20 + 20$

40

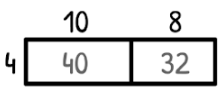


$2 \cdot 10 + 2 \cdot 10$

$20 + 20$

40

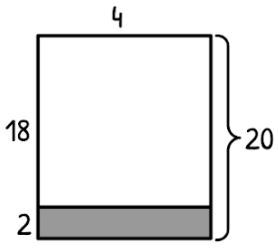
$4 \cdot 18$



$4 \cdot 10 + 4 \cdot 8$

$40 + 32$

72

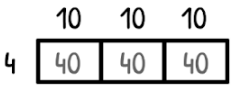


$4 \cdot 20 - 4 \cdot 2$

$80 - 8$

72

$4 \cdot 30$

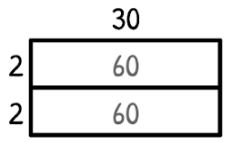


$4 \cdot 10 + 4 \cdot 10 + 4 \cdot 10$

$3(4 \cdot 10)$

$3(40)$

120

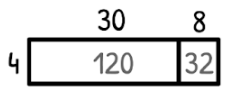


$2 \cdot 30 + 2 \cdot 30$

$60 + 60$

120

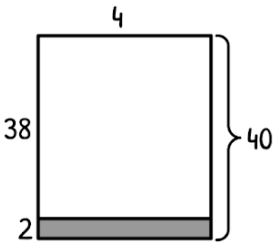
$4 \cdot 38$



$4 \cdot 30 + 4 \cdot 8$

$120 + 32$

152



$4 \cdot 40 - 4 \cdot 2$

$160 - 8$

152

Activity 1: Rice Advice

1. *Responses vary.* The recipes are different because they make different amounts of rice. They are the same because both recipes have the same relationship between rice and water.
2. *Responses vary*. They are called equivalent ratios because the relationship between rice and water is the same in each recipe.
3. *Responses and explanations vary*. Marco could use 6 cups of water and 4 cups of rice. That will work because it's the same as doing the original recipe twice.
4. 9 cups of water to 6 cups of rice.

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Unit 6.2, Lesson 3: Rice Ratios

Answer Key

Activity 2: Rice Around the World

Jollof Rice:

- 8 cups rice
- 6 tablespoons of tomato paste
- 2 bell peppers
- 10 tomatoes
- 4 onions
- $\frac{2}{3}$ cups of oil

Arroz Con Leche:

1.
   - 6 cups of rice
   - 12 cups of milk
   - 1 cup of sugar
   - 3 handfuls of raisins
   - 3 cinnamon sticks

2. *Responses vary*. Valeria might have thought that to change the recipe from 4 to 12 people, you'd need 8 more of everything, including 8 more cinnamon sticks.

3. I would tell her that the recipe calls for 1 cinnamon stick for *every* 4 *people*, not every 1 person.

Champorado:

1.
   - 8 cups water
   - 4 cans coconut milk
   - 1 cup of cocoa powder
   - 4 cups sugar

2. This will serve 8 people.

Risotto:

1. *Responses vary*.
   - 1.5 cups rice
   - 5 cups chicken broth
   - 2 tablespoons olive oil
   - 1 tablespoon butter
   - 4 ounces parmesan cheese

2. This will serve 4 people.

Lesson Synthesis

1. *Responses vary.* Equivalent ratios are when two or more ratios show the same relationship between two quantities.

2. *Responses vary.* 9 cups of water to 6 cups of rice.

Cool Down

✓ 3 teaspoons of yeast to 2 cups of flour

✓ 18 teaspoons of yeast to 12 cups of flour

Unit 6.2, Lesson 6: Product Prices

Answer Key

Warm-Up (Projection Sheet)

No. *Explanations vary.* Four tomatoes at $0.50 each would be the same price as five tomatoes for $2.

Activity 1: How Much for One?

1. C, B, A
2. *Explanations vary.* I took the price shown on each card and divided it by the number of items on it.
3. **A:** $3.50 *Explanations vary.* $7 \div 2 = 3.5$
   B: $2.40 *Explanations vary.* $24 \div 10 = 2.4$
   C: $1.25 *Explanations vary.* $5 \div 4 = 1.25$

Activity 2: How Much for Many?

1.
   D: $2.00 *Explanations vary.*
   - **Price for** 1**:** $3 \div 6 = 0.5$
   - **Price for** 4**:** $4 \times 0.5 = 2$

   E: $4.50 *Explanations vary.*
   - **Price for** 1**:** $6 \div 4 = 1.5$
   - **Price for** 3**:** $3 \times 1.5 = 4.5$

   F: $1.60 *Explanations vary.*
   - **Price for** 1**:** $2.4 \div 12 = 0.2$
   - **Price for** 8**:** $8 \times 0.2 = 1.6$

2. *Responses vary.*
3. E. *Explanations vary.* Mariana's double number line shows four items with a total cost of $6, with a question mark for the price of 3. This matches card E.
4. *Responses vary.*
5. *Responses vary.*

   G: $8.00 *Explanations vary.*
   - **Price for** 5**:** $4
   - **Price for** 10**:** $2 \times 4 = 8$

   H: $6.00 *Explanations vary.*
   - **Price for** 1**:** $16 \div 8 = 2$
   - **Price for** 3**:** $3 \times 2 = 6$

   I: $1.40 *Explanations vary.*
   - **Price for** 1**:** $2.4 \div 12 = 0.2$
   - **Price for** 7**:** $7 \times 0.2 = 1.4$

   J: $4.50 *Explanations vary*
   - **Price for** 6**:** $9
   - **Price for** 3**:** $9 \div 2 = 4.5$

   K: $12.50 *Explanations vary.*
   - **Price for** 1**:** $10 \div 4 = 2.5$
   - **Price for** 5**:** $5 \times 2.5 = 12.5$

   L: $2.00 *Explanations vary.*
   - **Price for** 3**:** $1
   - **Price for** 6**:** $2 \times 1 = 2$

6.1 *Responses vary.*
6.2 Mariana represented her thinking visually. Naoki tried to find a unit price to make a calculation for a different amount easier.
6.3 *Responses vary.*

Are You Ready for More?

Responses vary. 2 items from card A, 5 items from card B, and 2 items from card D.

Lesson Synthesis

1. *Responses vary.*
2. *Responses vary.* Find a unit price by dividing the price by the number of items. Use this to calculate the new price.

Cool Down

1. $0.75 *Explanations vary.* $3 \div 4 = 0.75$
2. $5.00 *Explanations vary.*
   - **Price for** 1**:** $7.5 \div 6 = 1.25$
   - **Price for** 4**:** $4 \times 1.25 = 5$

Unit 6.2, Lesson 8: World Records

Answer Key

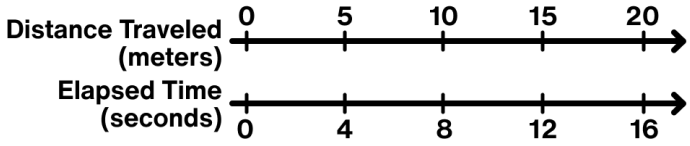
Warm-Up (Projection Sheet)

Bus. *Explanations vary.* The bus travels the same distance as the car in a shorter amount of time.

Activity 1: Moving 10 Meters

1. *Responses vary.*
   Distance: 10 meters
   Time: 8 seconds

2. *Responses vary.*



3. *Responses vary.* 1.25 meters per second

4. *Responses vary.*
   - 5 meters: 4 seconds
   - 20 meters: 16 seconds

Activity 2: World Records

1. *Responses vary.*

2. *Responses vary.* The elapsed time for each record.

3. *Responses vary.*

4. *Responses vary.*

   Slowest
   You (1.25 m per second)
   Danyl Boldyrev (2.5 m per second)
   César Cielo (2.5 m per second)
   Keni Harrison (8 m per second)
   Fastest

5. *Responses and explanations vary.*

   Slowest
   You (1.25 m per second)
   César Cielo (≈ 2.39 m per second)
   Danyl Boldyrev (≈ 2.68 m per second)
   Keni Harrison (≈ 8.20 m per second)
   Fastest

   For each athlete, I divided the distance by the exact time.

Are You Ready for More?

1. Florence Griffith Joyner
   (≈ 9.53 m per second)

2. Marita Koch (≈ 8.4 m per second)

3. *Responses and explanations vary.*
   Yes. I anticipated Florence Griffith Joyner would be faster than Marita Koch because I thought that the average speed for 100 m would be faster than the average speed for 400 m.

Lesson Synthesis

Responses vary. For each athlete, divide the distance by the time. The larger value belongs to the faster athlete.

Cool Down

Cyclist B

Explanations vary. Cyclist B travels 20 m per second, whereas Cyclist A travels 15 m per second.

Unit 6.3, Lesson 1: Many Measurements

Answer Key

Warm-Up

1. *Responses vary*. A pineapple.
2. *Responses vary.* A grapefruit.
3. *Responses vary*. A cherry.
4. *Responses vary*. I would be more certain of my answers if I could measure the height, size, or mass/weight of the objects.

Activity 1: Describe It

1. *Responses vary*.
2. *Responses vary*.

Easy to Describe	Hard to Describe
1 foot, 1 meter, 1 square inch, 1 yard	1 gallon, 1 millimeter, 1 square foot, 1 cup

Activity 2: Sort It

Questions 1–2:

Attribute	Smallest Unit ... Largest Unit
Length	1 millimeter, 1 centimeter, 1 kilometer, 1 mile
Volume	1 milliliter, 1 cup, 1 liter, 1 gallon
Mass/Weight	1 gram, 1 ounce, 1 pound, 1 kilogram

3.

Attribute	Smallest Unit			Largest Unit
Length	1 millimeter: Thickness of a dime	1 centimeter: Width of a pinky finger	1 kilometer: Distance walked in 10 minutes	1 mile: Distance run in 10 minutes
Volume	1 milliliter: Volume of water in a raindrop	1 cup: Volume of milk in a school milk carton	1 liter: Volume of soda in half of a large soda bottle	1 gallon: Volume of milk in a large milk jug
Mass/Weight	1 gram: Mass of a paper clip	1 ounce: Weight of a slice of bread	1 pound: Weight of a hooded sweatshirt	1 kilogram: Mass of a textbook

4. *Responses vary*. We could measure its length, volume, or mass/weight.

Are You Ready for More?

Responses vary.

Lesson Synthesis

1. *Responses vary*. We could measure its mass/weight, volume, height, width, and circumference.

2. *Responses vary*. For height, width, and circumference, I would use a unit of measure for length. A small unit like centimeters or inches would work best. The volume and mass/weight of the can are also small, so I could use smaller units like milliliters for volume, and ounces or grams for mass/weight.

Cool-Down

1. The smaller fish tank is Lukas's (20 cups) and the larger fish tank is Malik's (20 gallons).

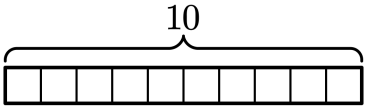
2. *Responses vary*. 1 liter is larger than 1 cup and smaller than 1 gallon. This means Angel's fish tank is larger than Lukas's fish tank and smaller than Malik's.

Unit 6.4, Lesson 5: Garden Bricks

Answer Key

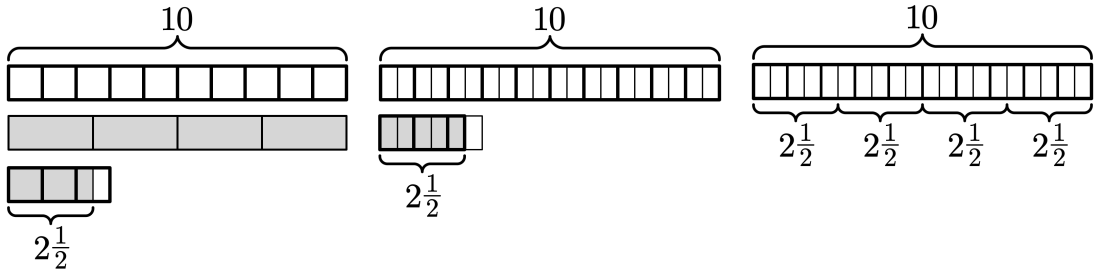
Warm-Up

1. *Responses vary.* I know $10 \div 2\ \frac{1}{2}$ represents the question because division is what we use to figure out how many groups of $2\ \frac{1}{2}$ are in 10.

2. 

3. 4

   Responses vary.



Activity 1: How Many Bricks?

1. 12 bricks

2. 6 bricks

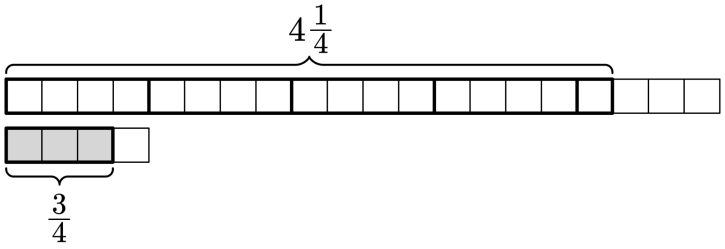
3. $7\ \frac{1}{2}$ bricks

4. *Responses vary.* Deja: $5 \div 1$ is equal to 5, $5 \div 2$ is less than 5, and $5 \div \frac{2}{3}$ is greater than 5.

   Emma: There is a third of a foot remaining, so you need $\frac{1}{2}$ of a large brick for $\frac{1}{3}$ of a foot.

5.1 $4\ \frac{1}{4}$ is the length of the garden in feet. $\frac{3}{4}$ is the length of each brick in feet.

5.2 $5\ \frac{2}{3}$ (or equivalent)

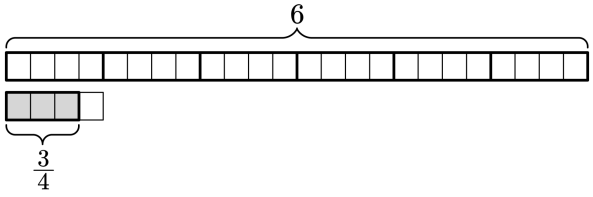
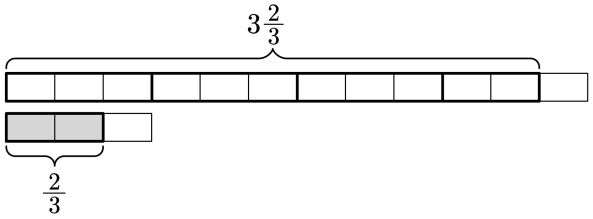
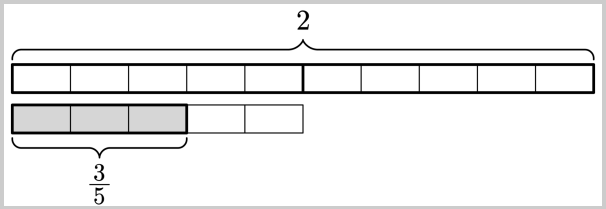
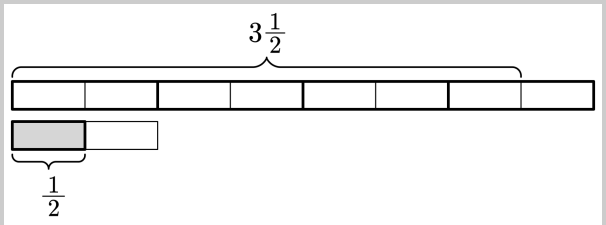


desmos

Unit 6.4, Lesson 5: Garden Bricks

Answer Key

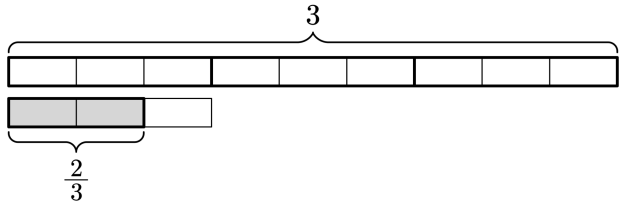
Activity 2: What's Missing?

	Division Sentence	Tape Diagram	Answer
1	$6 \div \frac{3}{4}$		8
2	$3\frac{2}{3} \div \frac{2}{3}$		$5\frac{1}{2}$
3	$2 \div \frac{3}{5}$		$3\frac{1}{3}$
4	$3\frac{1}{2} \div \frac{1}{2}$		7

Are You Ready for More?

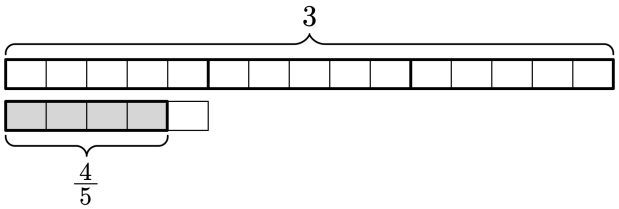
Responses vary.

Lesson Synthesis

1. 

2. *Responses vary.* The tape diagram shows that $4\frac{1}{2}$ groups of $\frac{2}{3}$ make 3.

Cool-Down



$3 \div \frac{4}{5} = 3\frac{3}{4}$ (or equivalent)

Unit 6.4, Lesson 10: Swap Meet

Answer Key

Warm-Up

1. *Responses vary*.
   - A: I see 2 as two whole sections in the top rectangle and $\frac{1}{3}$ as one of three parts of one whole section in the bottom rectangle.
   - B: I see 2 as $\frac{1}{3}$ of the rectangle.

2. 6. *Explanations vary.*
   - A: I can see that 6 pieces of the $\frac{1}{3}$ section of the bottom tape diagram can fit into the top tape diagram.
   - B: If each section of the tape diagram is equal to 2, then the whole tape diagram is equal to 6, since $2 \cdot 3 = 6$.

Activity 1: Match and Solve

1. and 2.

A. Expression: $\frac{3}{4} - \frac{1}{2}$, Answer: $\frac{1}{4}$

B. Expression: $\frac{3}{4} \times \frac{1}{2}$, Answer: $\frac{3}{8}$

C. Expression: $\frac{3}{4} \div \frac{1}{2}$, Answer: $\frac{3}{2}$

D. Expression: $\frac{1}{2} \div \frac{3}{4}$, Answer: $\frac{2}{3}$

3. *Responses vary.*

C. $\frac{3}{4} \div \frac{1}{2}$ can be written as the question "How many times does $\frac{1}{2}$ of a cup fit into $\frac{3}{4}$ of a cup?", which matches the question for C.

Activity 2: Write, Trade, Solve!

A. 2	**B.** $\frac{5}{9}$	**C.** 20	**D.** $\frac{4}{45}$	**E.** $\frac{3}{2}$
F. $\frac{1}{2}$	**G.** $\frac{5}{4}$	**H.** $\frac{20}{3}$	**I.** $\frac{45}{4}$	**J.** $\frac{27}{2}$

Responses vary.

1. $1\frac{1}{2} \div \frac{3}{4}$
2. A gardener has enough potting soil for an area of $1\frac{1}{2}$ square meters. If one side of the planter is $\frac{3}{4}$ of a meter, how long is the other side?
3. 2 meters
4. *Responses vary.*

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Unit 6.4, Lesson 10: Swap Meet

Answer Key

Lesson Synthesis

1. $\frac{5}{4} \div \frac{2}{3}$ *Explanations vary.* We need to find out how many times $\frac{2}{3}$ fits into $\frac{5}{4}$.
2. $\frac{15}{8}$ (or equivalent)

Cool-Down

1. 9
2. $\frac{3}{10}$ (or equivalent)

Unit 6.4, Lesson 12: Puzzling Areas

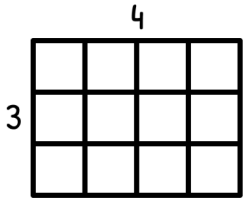
Answer Key

Warm-Up (Projection Sheet)

1. 12
2. $1\frac{1}{3}$
3. $\frac{1}{12}$
4. $\frac{1}{6}$

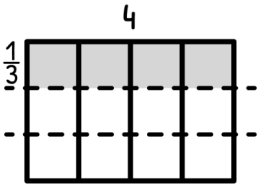
Strategies Students Might Use in the Number Talk

$3 \cdot 4$



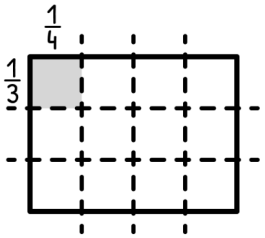
12 squares

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



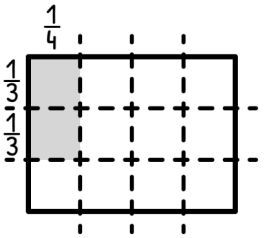
$1\frac{1}{3}$

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



$\frac{1}{12}$

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



$\frac{2}{12} = \frac{1}{6}$

Activity 1: Rectangle Areas

Rectangle	*A*	*B*	*C*	*D*	*E*	*F*
Area (sq. units)	1	$\frac{1}{4}$	$8\ \frac{3}{4}$	1	$\frac{45}{8}$	$\frac{2}{9}$

Activity 2: Level Up Area Puzzles

Level 1: $\frac{2}{3}$ cm (or equivalent)

Level 2: 8 sq. cm (or equivalent)

Level 3: $\frac{5}{3}$ cm (or equivalent)

Level 4: 6 sq. cm (or equivalent)

Level 5: $5\ \frac{1}{2}$ sq. cm (or equivalent)

Level 6: $\frac{10}{3}$ sq. cm (or equivalent)

Are You Ready for More?

Responses vary.

Lesson Synthesis

Responses vary.

- Multiplication is helpful when you know the base and height and are trying to calculate the area.
- Division is helpful when you know the area and want to find a side length.

Cool-Down

4 cm

Unit 6.5, Lesson 7: Multiplication Methods

Answer Key

Warm-Up

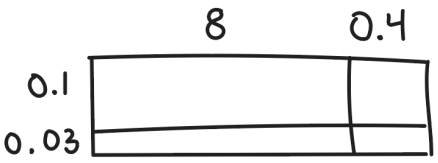
1. $1\,092$
2. *Responses vary.*
   - I multiplied $84 \cdot 10$ and $84 \cdot 3$, then added them together.
   - I used an area model and split the rectangle into 80 and 4 by 10 and 3.
   - I used a vertical calculation to multiply the numbers.

Activity 1: Multiple Methods

1.2 *Responses vary.* Kwame's and Tiara's strategies both break the problem into four parts. They are different because Kwame is multiplying decimals the entire time while Tiara is not. She multiplies whole numbers and then changes her answer into a decimal at the end.

1.3

Kwame



Tiara

$8.4 \cdot 0.13$

$84 \cdot 13 \cdot \frac{1}{10} \cdot \frac{1}{100}$

1.4 1.092

2. C. 0.435

3. 19.8 or 19.80. *Explanations vary.* We are multiplying tenths by tenths so the product is $1\,980$ hundredths.

4.1 ✓$0.06 \cdot 0.4$ ✓$0.6 \cdot 0.04$ ✓$2 \cdot 0.012$ ✓$1.2 \cdot 0.02$

4.2 *Responses vary.* $0.08 \cdot 0.3, 2.4 \cdot 0.01$

Activity 2: Scavenger Hunt

Question	Answer
Calculate $2.8 \cdot 0.41$	1.148
Multiply $19 \cdot 0.72$	13.68
Calculate $4 \cdot 0.307$	1.228
Determine the value of $0.19 \cdot 7.2$	1.368
Calculate $4.1 \cdot 2.8$	11.48
Determine the value of $30.7 \cdot 0.4$	12.28

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Unit 6.5, Lesson 7: Multiplication Methods

Answer Key

Are You Ready for More?

Responses vary. $5.1 \cdot 4.7 = 23.97$, $6.1 \cdot 3.9 = 23.79$

Lesson Synthesis

Responses vary. One strategy is to rewrite each number as a whole number times a fraction. That way, you can multiply the whole numbers and then figure out the place value.

Cool-Down

0.336

Unit 6.5, Lesson 9: Long Division Launch

Answer Key

Warm-Up

73

Activity 1: Strategies for Dividing

1.2 *Responses vary*. Ali's and Camila's strategies are similar because they both subtract off multiples of 5 until there are no multiplies of 5 left. They are different because Ali subtracts off a bigger number first, and Camila just looks at the hundreds and tens place to decide what to subtract off first.

1.3

Ali

$$\begin{array}{r|l} 4 & 864 \\ -800 & \\ \hline 64 & \end{array}$$

(200) ← 800 is $200 \cdot 4$

Camila

$$\begin{array}{r|l} & 2 \\ \hline 4 & 864 \\ -8 & \\ \hline 0 & \end{array}$$

← 200 groups of 4

Activity 2: Long Division

1.1

First Step	G	F	C	H	B	D	A	E	Last Step
	K	J			I			L	

1.2 See above. Each explanation card is written below the step it matches with.

1.3 *Responses vary.*

C: Bring down the 5. There are 5 tens.

H: How many groups of 3 are in 5 (tens)? 1 (ten). Write 1 in the tens place.

D: Bring down the 7. There are 27 ones.

A: How many groups of 3 are in 27? 9. Write 9 in the ones place.

2.

$$\begin{array}{r|l} & 1254 \\ \hline 4 & 5016 \\ -4 & \\ \hline 10 & \\ -8 & \\ \hline 21 & \\ -20 & \\ \hline 16 & \\ -16 & \\ \hline 0 & \end{array}$$

3.

$$\begin{array}{r|l} & 143 \\ \hline 9 & 1287 \\ -9 & \\ \hline 38 & \\ -36 & \\ \hline 27 & \\ -27 & \\ \hline 0 & \end{array}$$

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Unit 6.5, Lesson 9: Long Division Launch

Answer Key

Activity 2 Synthesis

Responses vary.

- It's important to keep things lined up so you can follow all the steps.
- It's important to remember the place value of each number in your answer. Then you can put that number in the right place in the quotient.

Activity 3 Warm-Up

Equal. *Explanations vary*. 2.55 is like 255 hundredths, and 0.05 is like 5 hundredths. I can determine the value of $2.55 \div 0.05$ by calculating $255 \div 5$, so the expressions are equal.

Activity 3: Different Expression, Same Value

1. ✓ $255 \div 5$

   ✓ $\frac{255}{100} \div \frac{5}{100}$

   ✓ $\frac{2550}{1000} \div \frac{50}{1000}$

2. *Expressions and responses vary*. I would use $255 \div 5$ because they are both whole numbers and I can think of this problem as 255 hundredths divided by 5 hundredths.

3. ✓ $360 \div 12$

   ✓ $\frac{36}{10} \div \frac{12}{100}$

   ✓ $\frac{360}{100} \div \frac{12}{100}$

4. *Expressions and responses vary*. I would use $360 \div 12$ because they are both whole numbers and I can think of this problem as 360 hundredths divided by 12 hundredths.

5. 30

6.

A. 282	B. 85	C. 454
D. 121	E. 314	F. 130
G. 54	H. 27	I. 430
J. 70	K. 40	L. 1430

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Unit 6.5, Lesson 9: Long Division Launch

Answer Key

Lesson Synthesis

Responses vary. A strategy for dividing with decimals is to write an expression that has the same value. For example, 15.2 is like 152 tenths and 0.4 is like 4 tenths. If I want to know how many groups of 4 tenths go into 152 tenths, I can calculate $152 \div 4$.

Cool-Down

1. 125
2. 43

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Unit 6.5, Lesson 10: Return of the Long Division

Answer Key

Warm-Up

0.2, 0.08, 0.007

Activity 1: Division Strategies

Round 1	Round 2	Round 3
5.3	13.25	13.2
Work varies.	*Work varies.*	*Work varies.*

1. *Responses vary*. When the quotient is not a whole number, you can keep dividing. Don't stop! Your answer will have a decimal part. If there wasn't a decimal point originally, add a decimal point and then continue dividing. You can divide using long division or using a diagram.

2.

$\frac{7}{10} \div \frac{4}{10} = 7 \div 4$

$$\begin{array}{r} 1.75 \\ 4\overline{)\,7.00} \\ -4 \\ \hline 30 \\ -28 \\ \hline 20 \\ -20 \\ \hline 0 \end{array}$$

$\frac{2250}{100} \div \frac{4}{100} = 2250 \div 4$

$$\begin{array}{r} 562.5 \\ 4\overline{)\,2250.0} \\ -20 \\ \hline 25 \\ -24 \\ \hline 10 \\ -8 \\ \hline 20 \\ -20 \\ \hline 0 \end{array}$$

Are You Ready for More?

14.5, 13.75, 0.375

Activity 2: Finding Expressions

1. *Responses vary.*

. . . includes dividing by a number greater than 1. $62 \div 5$, $41 \div 4$, $1 \div 25$, $9 \div 1.2$, $18.6 \div 1.5$, $7 \div 8$, $53.8 \div 5$, $77.4 \div 5$	. . . includes dividing by a number less than 1. $12.6 \div 0.08$, $5.12 \div 0.05$, $2.7 \div 0.4$, $7.35 \div 0.3$
. . . includes dividing by a number in hundredths. $12.6 \div 0.08$, $5.12 \div 0.05$	. . . has a quotient less than 1. $1 \div 25$, $7 \div 8$
. . . has a quotient greater than 15. $12.6 \div 0.08$, $5.12 \div 0.05$, $77.4 \div 5$, $7.35 \div 0.3$	. . . has a quotient close to 10. $62 \div 5$, $41 \div 4$, $9 \div 1.2$, $18.6 \div 1.5$, $53.8 \div 5$, $3.7 \div 0.4$

2.

A: 12.4	B: 10.25	C: 0.04
D: 157.5	E: 102.4	F: 9.25
G: 7.5	H: 12.4	I: 0.875
J: 10.76	K: 15.48	L: 24.5

Lesson Synthesis

Responses vary.

- It's important to remember that you can rewrite the division problem so you aren't dividing by a decimal.
- You can use a hundredths chart or write both numbers as fractions to help you think about how to rewrite the problem.
- If the quotient isn't a whole number, you can just keep dividing. When you divide the remainder, it will be a decimal.

Cool-Down

35.5

Unit 6.5, Lesson 13: Grocery Prices

Answer Key

Warm-Up

1. *Responses vary.*

2. Less than $\$100$. *Explanations vary*. I know 1% of $\$1\,500$ is $\$15$, so 3% is $\$45$.

Activity 1: Grocery Prices

1.1 Anika. *Explanations vary*. 3% is the same as 3 per 100 or 3 hundredths.

1.2 $\$45$

2.

Hawaii	**Texas**	**Mississippi**
Expression: $0.03 \cdot 1\,598$	Expression: $0.03 \cdot 1\,190$	Expression: $0.03 \cdot 867$
$\$47.94$	$\$35.70$	$\$26.01$

3. *Responses vary.*
   - People make more money in different places. This means they can afford to spend more money on things like food.
   - Some places aren't close to farms, so food might cost more in these places.
   - People can buy all of the groceries on the list using 3% or less of their income in Seattle, Washington, and Austin, Texas.
   - If families spend more than 3% of their income on food, that means they have less money to spend on other things like a house, education, or even fun things. It might also mean they can't buy as much food as the other families.

Activity 2: Bought Milk?

1.1 $\$3$

1.2 C. *Explanations vary*. 4% is 0.04, and $75 \cdot 0.04 = 3$.

2.1 *Responses vary*. 9% is 0.09, so if I want to know 9% of the weekly cost of food in Mississippi, I can do $52 \cdot 0.09 = 4.68$.

2.2 *Responses and explanations vary*.
   - I agree with Wohali. I think milk should be 4% of the weekly food cost like it is in Austin, Texas. This means milk should cost $52 \cdot 0.04$ or $\$2.08$.
   - I disagree with Wohali. Maybe there aren't very many dairy farms in Mississippi and so they have to transport the milk in from other places. That would cost a lot, so the milk is more expensive to help pay for the extra cost.

3. *Responses vary.*
   - Wohali would say the milk is expensive in Honolulu because it is more than $0.04 * 94.20 = \$3.77$ or 4% of the weekly food cost.
   - Wohali would say milk in Seattle, Washington, is affordable because it is about $0.04 * 90 = \$3.60$ or 4% of the weekly food cost.

Are You Ready for More?

Responses vary.

- **Seattle, Washington**: Cheese in Honolulu is $\frac{6.84}{94.20} \cdot 100$ or about 7.3% of the weekly budget.

  In Seattle, 7.3% of the weekly budget is $\$6.57$. I propose that cheese should only cost $\$6.57$ per pound in Seattle.
- **Honolulu, Hawaii**: Eggs in Jackson are about 3.8% of the weekly budget, so I propose they should cost $0.038 \cdot 94.20 = \$3.58$ in Honolulu.
- **Jackson, Mississippi**: Apples in Austin are about 2.2% of the weekly budget, so I think they should cost $0.022 \cdot 52 = \$1.14$ per pound in Jackson.

Lesson Synthesis

Responses vary.

- A fair way to determine prices for groceries in different places is to try to make them about the same percentage of a person's food budget no matter where you live.

- One thing you could do is try to buy your groceries somewhere where it is less expensive.
- You can buy your groceries in bulk and share them with other families if you think food is too expensive. Usually bulk groceries cost less.
- If you think the price of groceries is too high but you have extra money, you can donate to a local food bank so that families that can't buy enough food can still get the food they need.
- If you think the price of groceries is too high, you could let the local government know and see if there is any way they can help people out.

- Why is food so expensive in Jackson? How can we make it so food is less expensive?
- What happens when there isn't enough food in a place? Does it get even more expensive?
- What are the most affordable foods people can eat that are also very nutritious?

Cool-Down

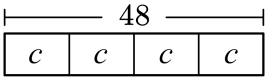
1. The families that make $\$175\,000$ per year spend more on food.
2. $\$8\,600$

Unit 6.6, Lesson 2: Five Equations

Answer Key

Warm-Up (Projection Sheet)

Responses vary.

1. This situation is about many cats that each weigh the same amount.
2. In this situation, the variable c represents the weight of each cat.
3. 

4. $c = 12$ pounds

Activity 1: Equations and Tape Diagrams

1. *Responses vary.*

Equation: **A** Equation: **D**	How are these equations similar? **They both have a 5, a 20, and an x.**	How are they different? **One involves addition and the other involves multiplication.**

2. C
3. E
4. A
5. *Responses vary.*

Activity 2: Which Equation?

	Equation	Solution	Meaning of Solution
1.	C	$x = 100$	Mohamed walked 100 blocks in 5 days.
2.	D	$x = 4$	Rebecca can buy 4 day passes to ride the subway.
3.	A	$x = 15$	After 15 bus stops Kwasi has 5 stops left.

4. *Responses vary.*

Lesson Synthesis

Responses vary. You can tell which equation represents a situation by deciding which equation has the same relationship between the values as they do in the situation.

Cool-Down

1. A
2. *Responses vary.* The solution to this equation is the number of miles Yasmine still has before she gets to her friend's house.

Unit 6.6, Lesson 5: Swap and Solve

Answer Key

Warm-Up (Projection Sheet)

Responses vary.

1. This situation is about the total cost to do many loads of laundry.
2. In this situation, the variable p represents the total number of loads of laundry .
3. Nyanna's equation is correct.
   Responses vary. The laundry costs $\$3.50$ per load, so you have to multiply 3.50 and the number of loads to get the total cost.

Activity 1: Stronger and Clearer Each Time

Responses vary.

1. $x + \frac{3}{4} = 6$
2. Before my break, I worked for x hours. Then I worked for $\frac{3}{4}$ of an hour. I worked 6 hours total.
3. x represents the number of hours I worked before my break.

Activity 2: Trade and Solve

Responses vary. Here are the solutions to each equation.

- $x + \frac{3}{4} = 6$, $x = 5\frac{1}{4}$ (or equivalent)
- $\frac{3}{4}x = 6$, $x = 8$ (or equivalent)
- $6x = \frac{3}{4}$, $x = \frac{3}{24}$ (or equivalent)
- $x - \frac{3}{4} = 6$, $x = 6\frac{3}{4}$ (or equivalent)
- $0.25 + x = 20$, $x = 19.75$ (or equivalent)
- $0.25x = 20$, $x = 80$ (or equivalent)
- $20 \cdot 0.25 = x$, $x = 5$ (or equivalent)
- $x - 20 = 0.25$, $x = 20.25$ (or equivalent)

Lesson Synthesis

Responses vary. When writing equations to represent situations, it is important to remember the relationship between the numbers and what the variable means.

Cool-Down

1. *Responses vary.* I brought 2.5 pounds of blueberries to a party. There were 10 pounds of blueberries at the party in total. There were x pounds of blueberries at the party before I arrived.
2. $x = 7.5$
3. There were 7.5 pounds of blueberries at the party before I arrived.

Unit 6.6, Lesson 9: Products, Sums, and Differences

Answer Key

Warm-Up

1. Rectangle A. Explanations vary. $3 \cdot 2x = 6x$ and $3 \cdot 1 = 3$.
2. $6x + 18$ (or equivalent)

Activity 1: Card Sort

1. *Groupings vary.*
2. *A:* $3(x + 6)$ and $3x + 18$
   B: $3(x + 2)$ and $3x + 6$
   C: $(3 + 2)x$ and $3x + 2x$
   D: $3(a + 3)$ and $3a + 9$
   E: $3(a + b)$ and $3a + 3b$
   F: $3(a + 3b)$ and $3a + 9b$
   Leftover cards: $3x + 9$ and $3a + b$
3. *Responses vary.* I put $3(x + 6)$ in Row A because the dimensions of the area model are 3 and $x + 6$.

Intermission

1. $3k - 6$ (or equivalent)
2. $5(4 - w)$ (or equivalent)

Activity 2: Writing Equivalent Expressions

1. A: $7c - 28$
   B: $8(3a + 2b)$ (or equivalent)
   C: $6(3 - 2d)$ (or equivalent)
   D: $4x + 2$
   E: $(4 + 5)y$ (or equivalent)
   F: $3a - 2b$

Are You Ready for More?

Responses vary.

Lesson Synthesis

Responses vary.

- $6 - 2x$ is equivalent to $2(3 - x)$ because $2 \cdot 3 = 6$ and $2 \cdot x = 2x$ and both expressions involve subtraction.
- You can use an area model to show that $6 + 2x$ and $2(3 + x)$ are equivalent, so it also makes sense that $6 - 2x$ is equivalent to $2(3 - x)$.

Cool-Down

$4x - 12y$ (or equivalent)

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Unit 6.6, Lesson 11: Exponent Expressions

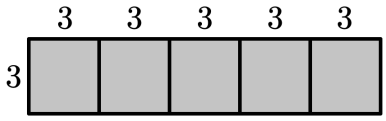
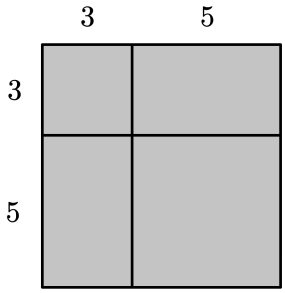
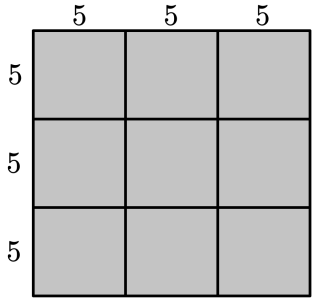
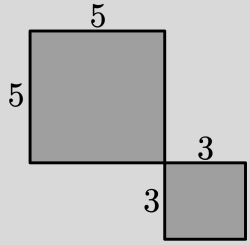
Answer Key

Warm-Up (Projection Sheet)

Responses vary.

- Top left doesn't belong because it is the only expression that has four parts.
- Bottom left doesn't belong because it is the only one that is just a number.
- Top right doesn't belong because it is the only expression that uses exponents.
- Bottom right doesn't belong because it is the only expression that is not equal to 16.

Activity 1: What's Missing?

	Diagram	Expression	Total Area (sq. units)
1		$5 \cdot 3^2$	45
2		$(3 + 5)^2$	64
3		$(3 \cdot 5)^2$	225
4	*Responses vary.* 	$5^2 + 3^2$	34

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Unit 6.6, Lesson 11: Exponent Expressions **Answer Key**

Intermission

1. D. *Responses vary.* The square represents 10^2 and the two small squares represent 2.

2. Nicolas is correct.
   Explanations vary. I agree with Nicolas because his answer matches the total area of Diagram D. There is a square with an area of 100 square units and 2 additional squares, so the total area is 102 square units.

Activity 2: Partner Problems

1. 29
2. 18
3. 48
4. 81
5. 27
6. $\frac{1}{72}$

Are You Ready For More? *Responses vary.*

Lesson Synthesis

Responses vary. If there are parentheses, then those operations should be evaluated first. Then, evaluate the parts of the expressions with exponents before you complete any other operations.

Cool-Down

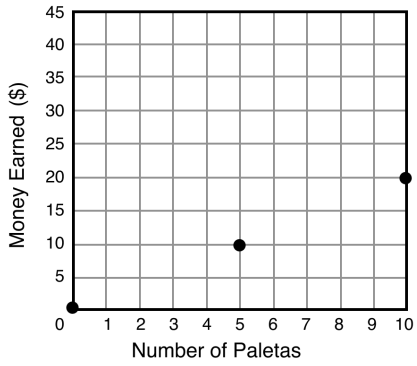
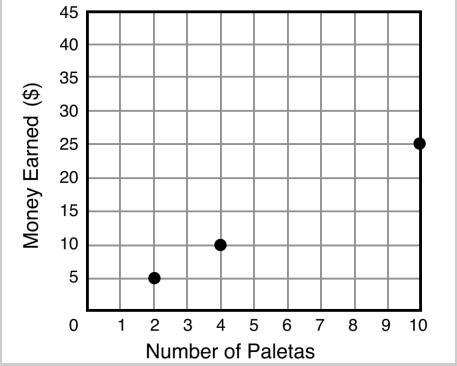
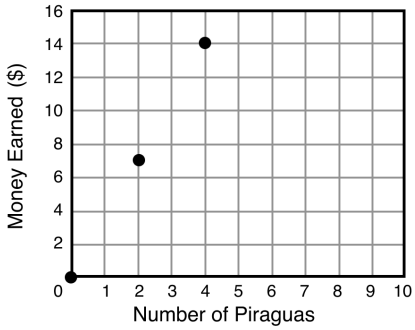
1. 32
2. 36

desmos Science Mom Lesson 59

Unit 6.6, Lesson 15: Connecting Representations

Answer Key

Activity 1: What's Missing?

	Story	Table	Graph	Equation
1	Amanda is selling paletas for $\$2$. What is the total amount of money they can make?	p | m 0 | 0 5 | 10 10 | 20		$m = 2p$
2	Tameeka is selling paletas for $\$2.50$. What is the total amount of money they can make?	p | m 2 | 5 4 | 10 10 | 25	*Graphs vary.* 	$m = 2.50p$
3	Esteban is selling piraguas for $\$3.50$. What is the total amount of money he can make?	*Tables vary.* p | m 2 | 7 4 | 14 10 | 35		$m = 3.50p$

1. *Responses vary*.

2. *Explanations vary.* Each of the points in Angel's graph will be a little above Esteban's. If you connected the points with a line, the line would be a little steeper.

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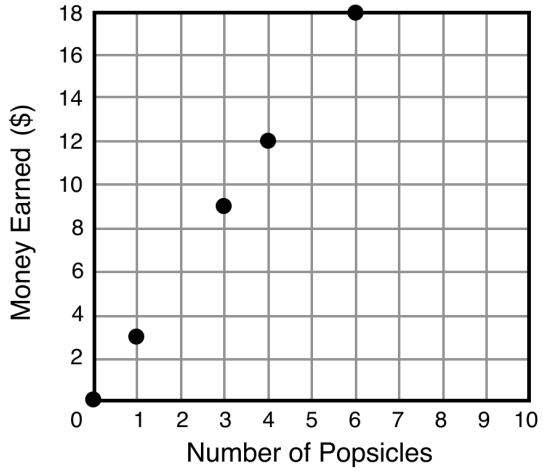
Unit 6.6, Lesson 15: Connecting Representations **Answer Key**

Activity 2: Rough Draft Graph

1.1 *Responses vary.* Sora put the independent and dependent variables on the correct axes.

1.2 *Responses vary.* I would change how the numbers are scaled on each axis.

2. *Responses vary.*



3. *Responses and explanations vary.* I circled the point $(3, 9)$. This point means that Sora sold three popsicles and earned $\$9$.

4. *Responses vary.* One mistake you might make is to switch the direction of plotting points. Instead of going over *then* up, you might switch things and go up first, then over.

Lesson Synthesis

Responses vary. First, you want to check that each representation has the same independent and dependent variable. Then you can use the relationship to fill in values on a table. The values in a table become the coordinates of points in a graph.

Cool-Down

Graph A

Explanations vary. In this graph, batches of brownies is on the x-axis and cups of sugar is on the y-axis. So the point $(1, \frac{1}{2})$ in this graph means that one batch of brownies will take $\frac{1}{2}$ of a cup of sugar.

desmos Science Mom Lesson 60

Unit 6.6, Lesson 16: Subway Fares

Answer Key

Warm-Up

Option 1: $7.50 Option 2: $30 Option 3: $3.75

Activity 1: Consider the Costs

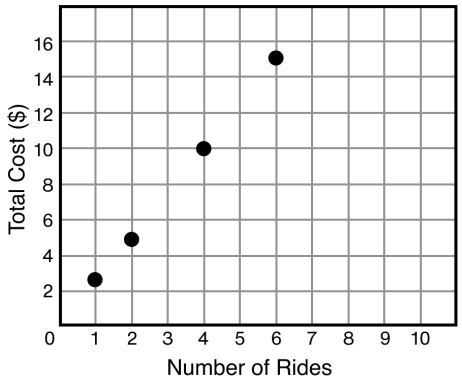
1. *Tables and graphs vary.*

Option 1

Table

# of Rides	Total Cost ($)
1	2.50
2	5
4	10
6	15

Graph



Equation

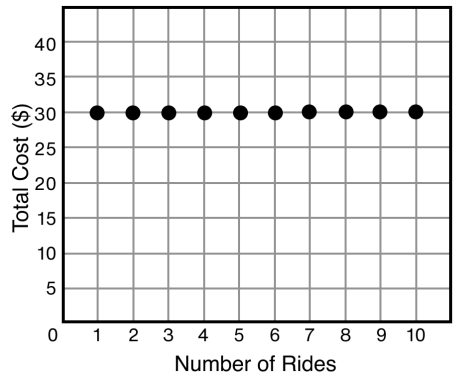
$c = 2.50r$

Option 2

Table

# of Rides	Total Cost ($)
1	30
2	30
3	30
4	30

Graph



Equation

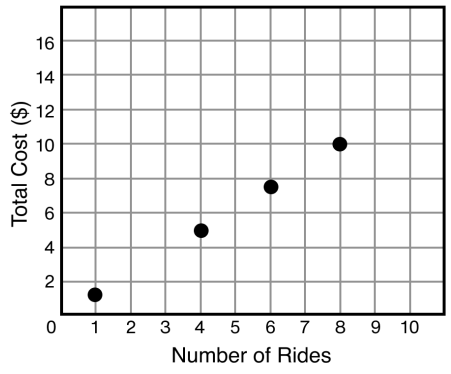
$c = 30$

Option 3

Table

# of Rides	Total Cost ($)
1	1.25
4	5
6	7.50
8	10

Graph



Equation

$c = 1.25r$

- "Number of Rides" is the independent variable and "Total Cost" is the dependent variable.

- *Explanations vary.* I noticed the graphs for each option seemed to follow a line pattern. All of the points for the Reduced Fare option are below the points for the Regular Fare option. All of the graphs have the same independent and dependent variables.

2. *Responses vary.*
   - Eliza qualifies for the Reduced Fare option. Riding the subway may cost her between $\$2.50$ and $\$10$ a week.
   - Nikhil qualifies for the Reduced Fare option. Riding the subway may cost him about $\$25$ a week.
   - Sydney should consider purchasing the Unlimited 7-Day Pass. The unlimited pass could save them about $\$20$ a week.
   - Bao should purchase individual Regular Fare rides. He does not ride the subway often enough for the unlimited pass to save him money.

Activity 2: Increased Fares

1. *Responses vary.*
   - One advantage to raising the fare is that the MTA will have more money to fund improvements to the subways and salaries for its employees.
   - One disadvantage is that many people may not be able to afford to spend more money to ride the subway.

2. *Responses vary.*
   - In the table, the total cost values would all increase.
   - In the graph, all of the points representing the price increase would be higher on the y-axis than the original points.
   - The equation would change to $y = 2.75x$.

3. *Responses vary.* I think the fare increase would impact Sydney the most. Sydney is a student and works part time, which might mean they do not have a lot of extra money to spend on subway fares.

4. *Responses vary.* I would suggest increasing the Regular Fare price, but keeping the Reduced Fare option $\$1.25$. This way, the MTA would still be able to earn more money, but fewer people would be negatively impacted.

Lesson Synthesis

Responses vary. By making a table, it helps us organize different pieces of information. By looking at a graph, it helps us see how things change over time and see trends and also compare things.

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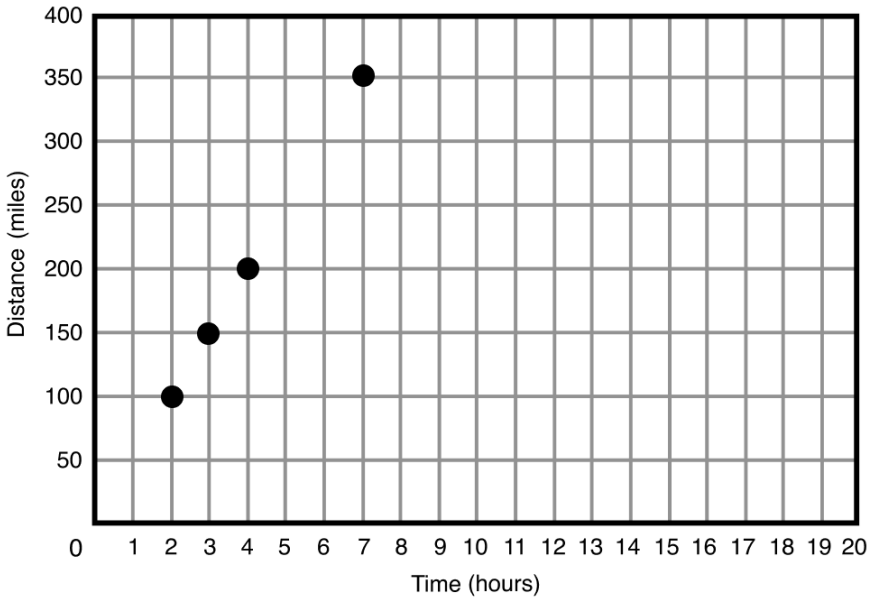
Unit 6.6, Lesson 16: Subway Fares

Answer Key

Cool-Down

Time (hours)	Distance (miles)
2	100
7	350
3	150
4	200



Unit 7.2, Lesson 3: Sugary Drinks

Answer Key

Warm-Up

- To determine the number of grams of sugar, you can multiply the number of days by 30.
- To determine the number of days, I can divide the number of grams of sugar by 30.

Activity 1: Orange Juice

1.

Orange Juice		
	Volume (oz.)	Sugar (grams)
Glass	8	22
Bottle	12	33
Carton	32	88
Jug	128	352

2. The constant of proportionality is 2.75.

3. There are 2.75 grams of sugar for each ounce of orange juice.

4. About 18.2 ounces. Divide 50 grams of sugar by 2.75 grams per ounce.

Activity 2: Other Sugary Drinks

1.

Apple Cider		
	Volume (oz.)	Sugar (grams)
Plastic Bottle	8.5	10.54
Large Cup	10	12.4
Glass Bottle	25	31

Carbonated Soda		
	Volume (oz.)	Sugar (grams)
Can	12	46.2
Personal Bottle	20	77
Large Bottle	68	261.8

Energy Drink		
	Volume (oz.)	Sugar (grams)
Mini Can	5	16.875
Regular Can	8	27
Jumbo Can	12	40.5

2. The carbonated soda is the most sugary.

   Explanations vary. The constant of proportionality for the carbonated soda is 3.85, which is higher than the constants of proportionality for the other two drinks.

3. Yes, the relationship between a beverage's volume and its grams of sugar is always proportional.

   Explanations vary. Regardless of whether the drink is big or small, the recipe—including the ratio between volume and sugar—will be the same.

4. No, the relationship is not proportional.

   Explanations vary. The ratio between sugar and weight is different for each candy. Thus, there is no constant of proportionality and the relationship is not proportional.

Are You Ready for More?

Responses vary.

Lesson Synthesis

1. The relationship between cups of rice and cups of water is proportional.
2. *Responses vary.* The constant of proportionality is $1\frac{1}{2}$. It means that there is $1\frac{1}{2}$ cups of water for every cup of rice.

Cool-Down

1. The constant of proportionality is 5.
2. *Explanations vary.* The constant of proportionality means that this particular shade of paint is made with 5 cups of yellow paint for every 1 cup of blue paint.