desmos Science Mom Lesson 65

Unit 7.2, Lesson 7: Equations of Proportional Relationships Name _____

1.a Use the information provided to fill in the missing information.

Story

Lucia earns $12 per hour.

Equation

Table

Hours (x)	**Pay** (y)
0	
1	
	30

Is it proportional?

Explain how you know.

---

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Unit 7.2, Lesson 7: Equations of Proportional Relationships Name _____

1.b Use the information provided to fill in the missing information.

Story

The recipe calls for 1 banana for every 2 smoothies.

Equation

Table

Smoothies (x)	**Bananas** (y)
0	0
1	
	2.5

Is it proportional?

Explain how you know.

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Unit 7.2, Lesson 7: Equations of Proportional Relationships Name _____

2.a Use the information provided to fill in the missing information.

Story

The cell phone costs $\$500$, plus $\$35$ per month for the plan.

Equation

Table

Months (x)	**Total Cost** (y)
0	
1	
	605

Is it proportional?

Explain how you know.

---

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Unit 7.2, Lesson 7: Equations of Proportional Relationships Name _____

2.b Use the information provided to fill in the missing information.

Story

The area of a square is the side length multiplied by itself.

Equation

Table

Side Length (x)	**Area** (y)
0	
1	
	100

Is it proportional?

Explain how you know.

desmos Science Mom Lesson 65

Unit 7.2, Lesson 7: Supplement Name _____

1.a Use the information provided to fill in the missing information.

Story	**Table**	**Is it proportional?**
Lucia earns $\$12$ per hour.		
Equation		**Explain how you know.**

Hours (x)	**Pay** (y)
0	
1	
	30

---

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Unit 7.2, Lesson 7: Supplement Name _____

1.b Use the information provided to fill in the missing information.

Story	**Table**	**Is it proportional?**
The recipe calls for 1 banana for every 2 smoothies.		
Equation		**Explain how you know.**

Smoothies (x)	**Bananas** (y)
0	0
1	
	2.5

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Unit 7.2, Lesson 7: Supplement Name _____

2.a Use the information provided to fill in the missing information.

Story	**Table**	**Is it proportional?**
The cell phone costs $\$500$, plus $\$35$ per month for the plan.		
Equation		**Explain how you know.**

Months (x)	**Total Cost** (y)
0	
1	
	605

---

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Unit 7.2, Lesson 7: Supplement Name _____

2.b Use the information provided to fill in the missing information.

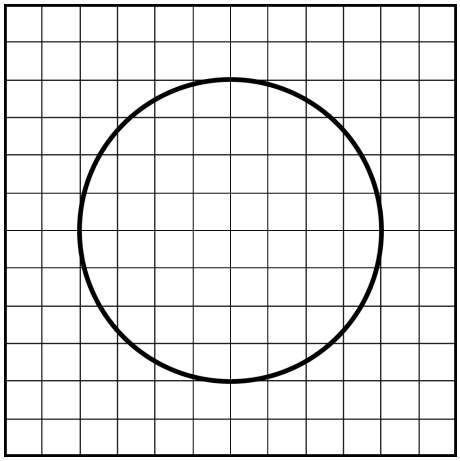
Story	**Table**	**Is it proportional?**
The area of a square is the side length multiplied by itself.		
Equation		**Explain how you know.**

Side Length (x)	**Area** (y)
0	
1	
	100

Unit 7.3, Lesson 6: Radius Squares Name(s) _____

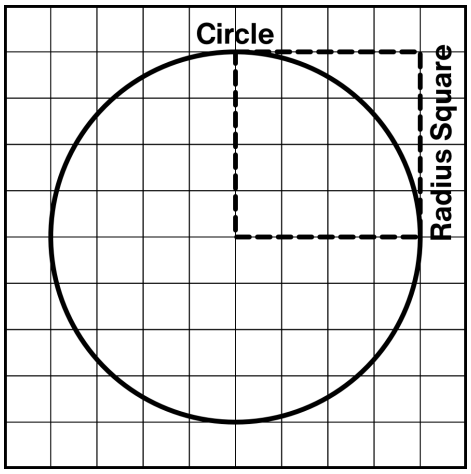
Activity 1: Estimating Circle Area

1. Estimate the number of unit squares it would take to cover Ayaan's circle (shown below). Record your own estimate and strategy. Then, find a person who got a different estimate or used a different strategy, and record their estimate and strategy.



My estimate:	My partner's estimate:
My strategy:	My partner's strategy:

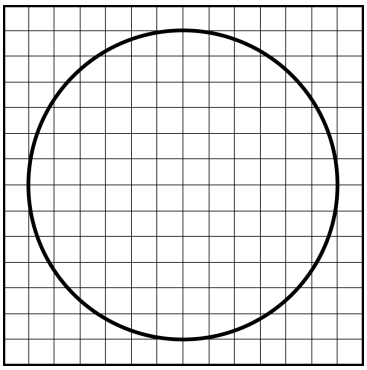
Each circle has a corresponding radius square. Here is the radius square for this circle.



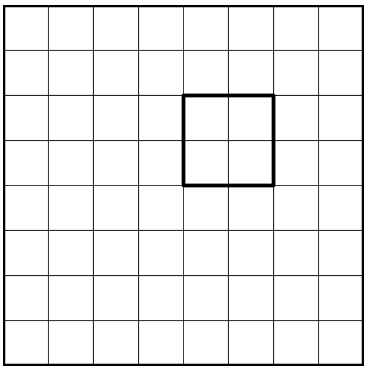
2. Why do you think we call this a radius square?

3. For this circle, one radius square has an area of 16 square units. About how many of these radius squares do you think it would take to cover just the circle?

4. Draw a radius square for this circle.



5. Draw a circle for this radius square.



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Unit 7.3, Lesson 6: Radius Squares Name(s) _____

Activity 2: Circle vs. Radius Square

For this activity, you will need circles and sets of radius squares.

For each circle and set of radius squares, cut up each radius square and rearrange the pieces so that they cover just the circle. Record what you and your classmates discover in the table below.

	Radius of the Circle	**Number of Radius Squares Needed to Cover the Circle**
Circle A		
Circle B		
Circle C		
Circle D		

In general, how many radius squares do you think it takes to cover a circle? _____

Activity 2 Synthesis

1. Precious says you can estimate the area of a circle by calculating $3 \cdot r^2$. What do you think each part of her expression means?

2. Do you agree with Precious? Use your earlier work to help support your thinking.

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Unit 7.3, Lesson 6: Radius Squares Name(s) _____

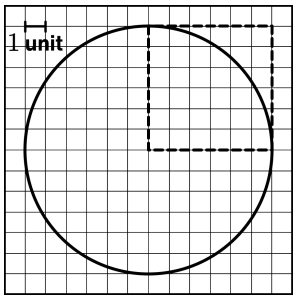
Activity 3: Circle Area

1. After watching the animation, do you think the formula $A = 3 \cdot r^2$ will give an overestimate or an underestimate for the area of a circle? Use the animation to help support your thinking.

2. Write a formula to calculate the **exact** area of a circle.

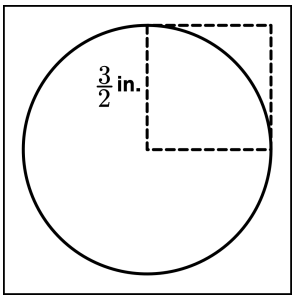
Calculate the exact area of each circle. (These are not drawn to scale.)

3.1



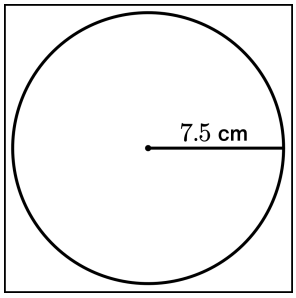
Area: _____

3.2



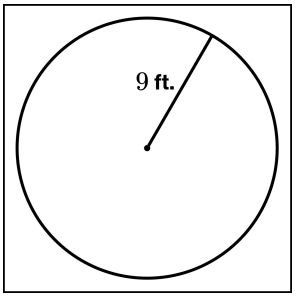
Area: _____

3.3



Area: _____

3.4



Area: _____

Are You Ready for More?

Is there a proportional relationship between the radius of a circle and its area? Use the circles from this activity to help you explain your thinking.

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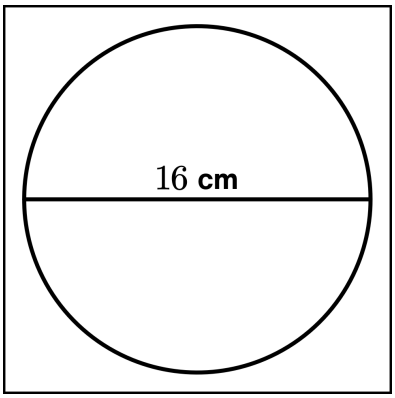
Unit 7.3, Lesson 6: Radius Squares Name(s) _____

Lesson Synthesis

Describe a strategy to calculate the area of a circle if you know its diameter. Use the circle below to help you with your explanation.



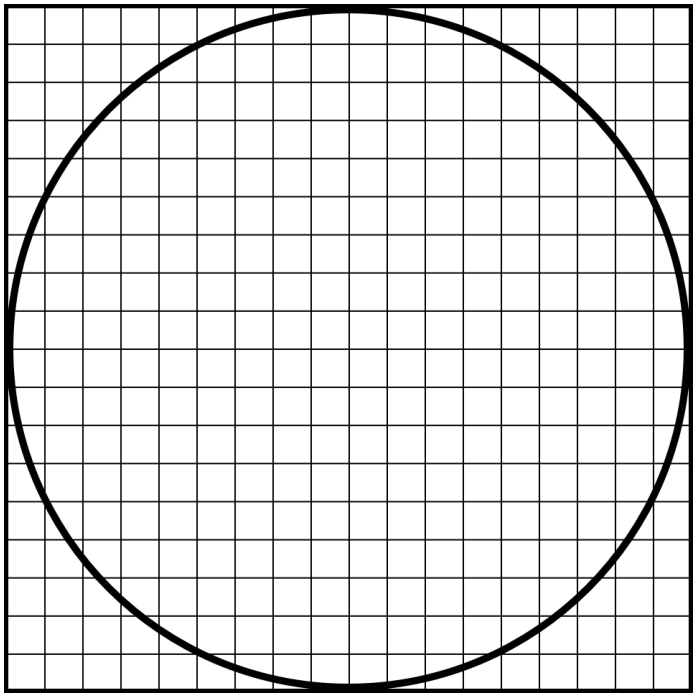
Cool-Down

Circle A has a diameter of approximately 20 inches.

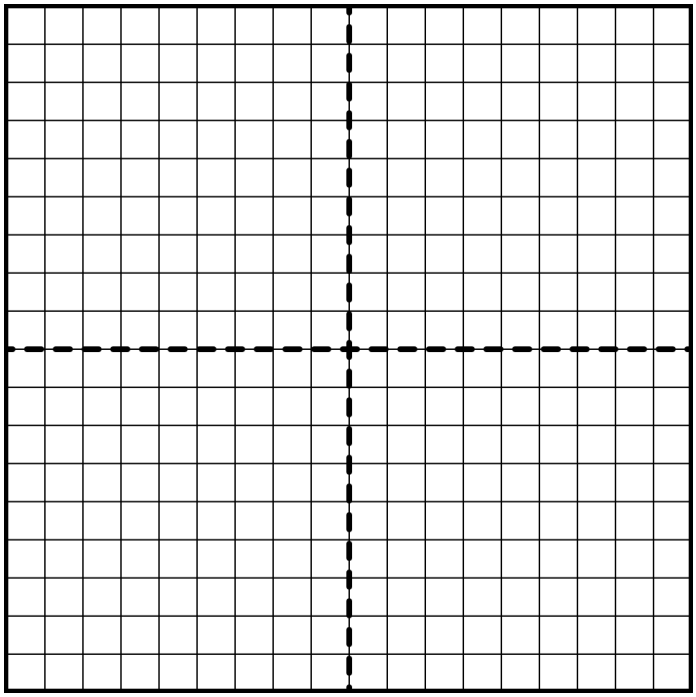
Which of these could be the area of circle A? Explain your reasoning.

A. About 100 in.^{2}
B. About 300 in.^{2}
C. About 400 in.^{2}
D. About $1\,200$ in.^{2}

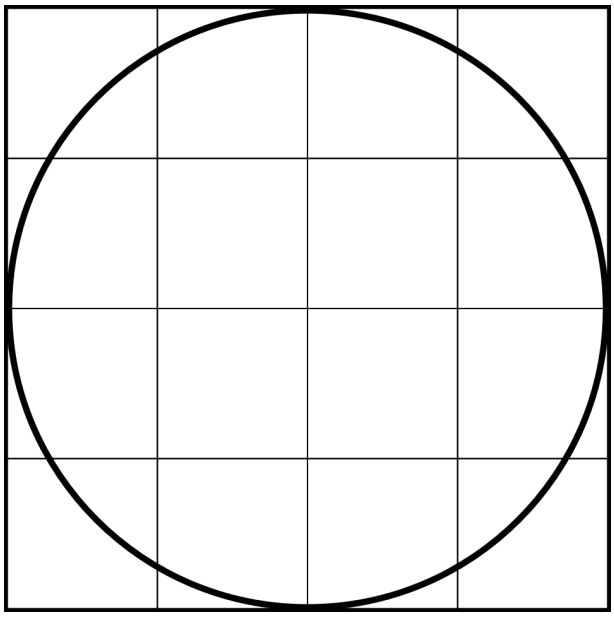
Circle A



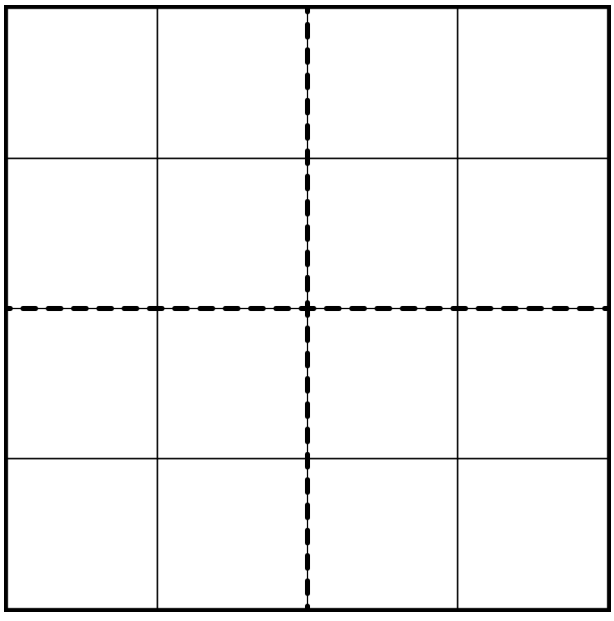
Radius Squares



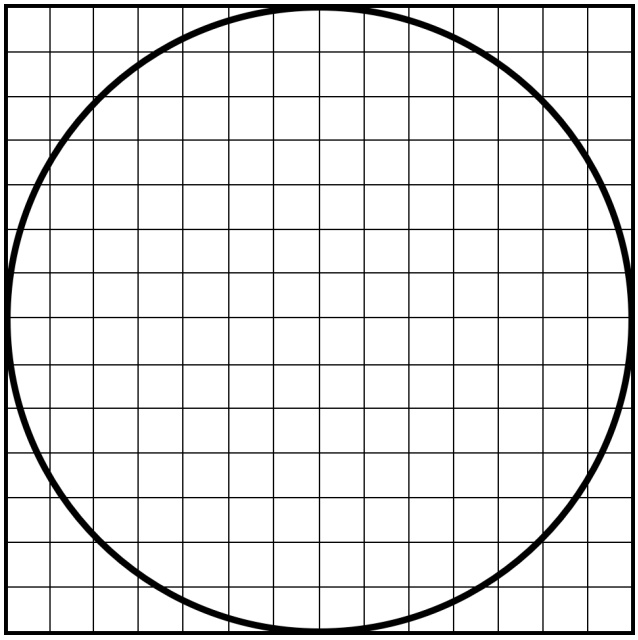
Circle B



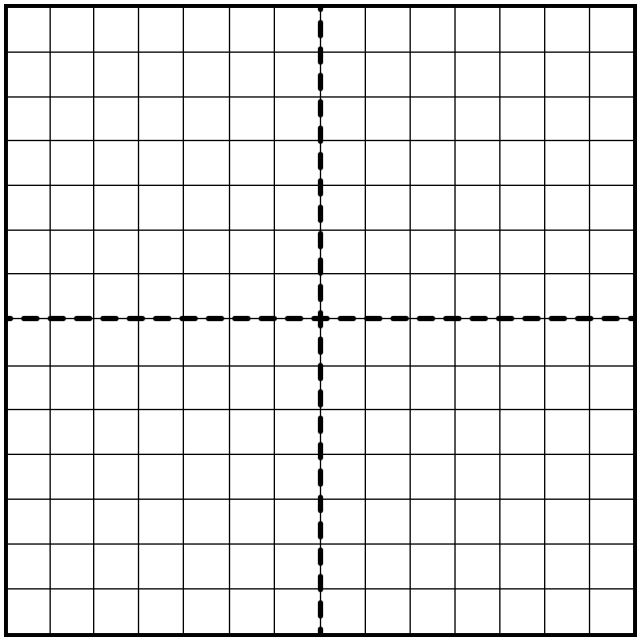
Radius Squares



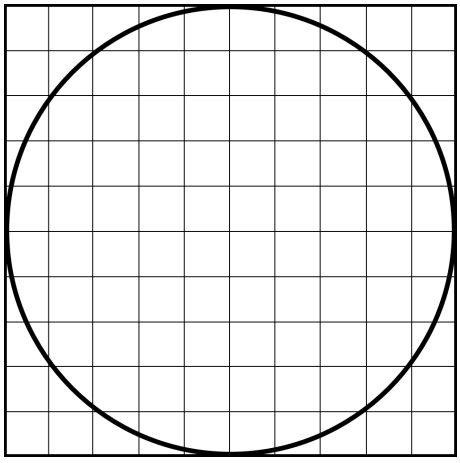
Circle C



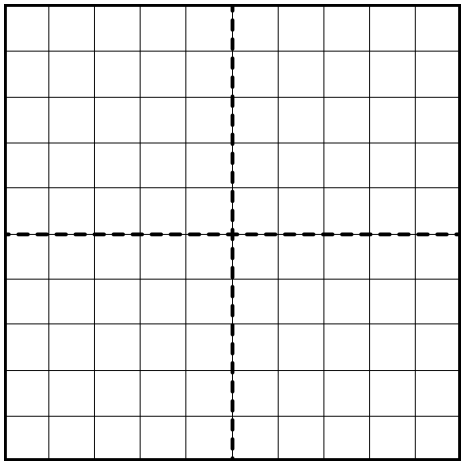
Radius Squares



Circle D

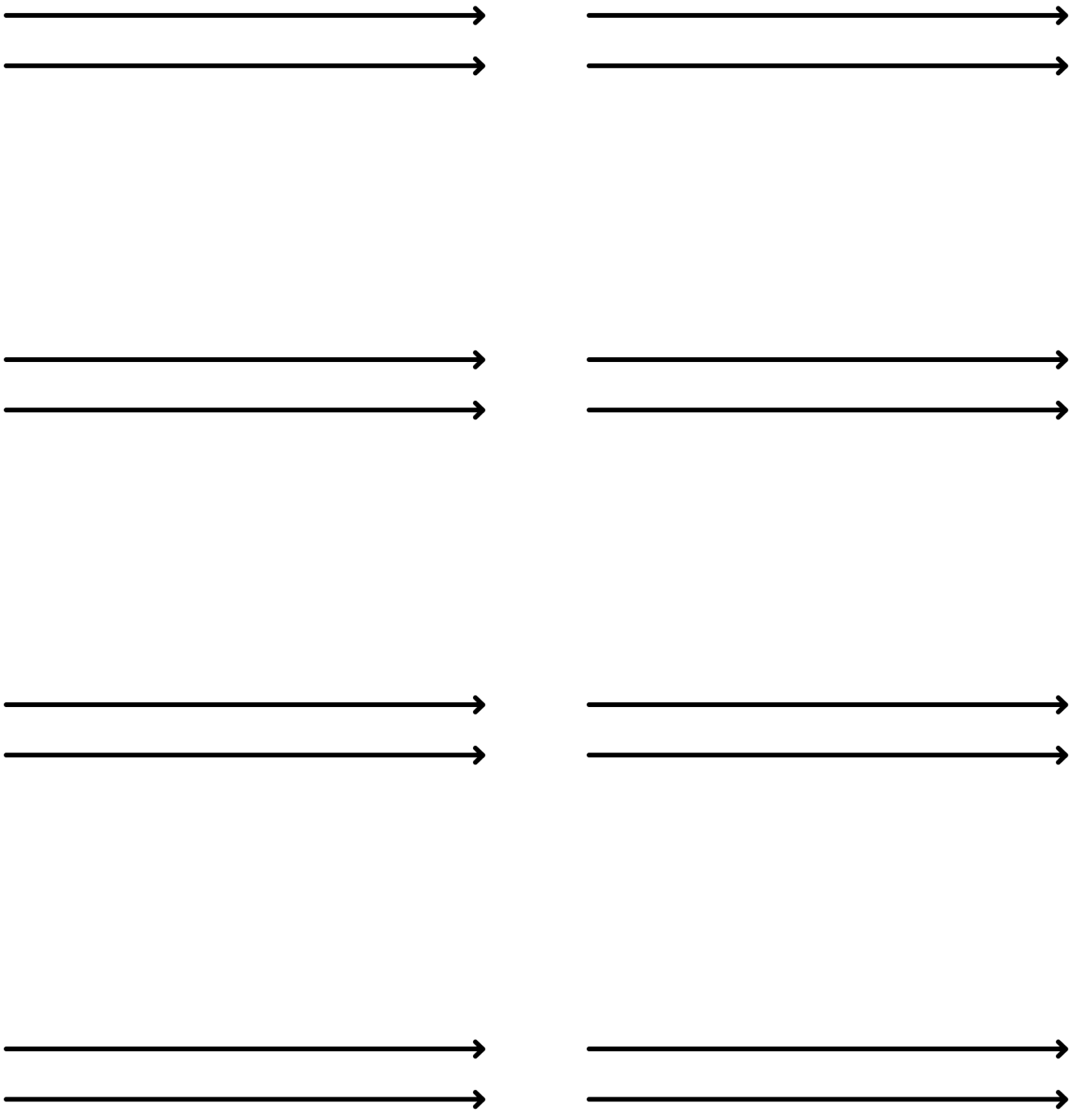


Radius Squares



Science Mom Lesson 79

Double Number Lines



Tables

Unit 7.4, Lesson 2: Peach Cobbler Name(s) _____

Activity 1: Which Recipe?

Amara is making peach cobbler. She has three recipes and is deciding which one to make.

Recipe A	**Recipe B**	**Recipe C**
Number of Servings: 9	**Number of Servings:** 12	**Number of Servings:** $4\frac{1}{2}$
• $2\frac{7}{10}$ lb. of peaches • $\frac{1}{2}$ cup of butter • 1 cup of flour • $1\frac{1}{8}$ cups of sugar • $\frac{1}{2}$ tsp. of lemon juice	• 4 lb. of peaches • $\frac{3}{4}$ cup of butter • $\frac{3}{4}$ cup of flour • $1\frac{1}{3}$ cups of sugar • $\frac{1}{2}$ tsp. of lemon juice	• $1\frac{4}{5}$ lb. of peaches • $\frac{1}{4}$ cup of butter • $\frac{2}{3}$ cup of flour • $\frac{3}{4}$ cup of sugar • 1 tsp. of lemon juice

Amara wants to make a recipe that isn't too sweet.

1. She thinks Recipe C will be the least sweet because it has the least amount of sugar. Do you agree? Explain your thinking.

2. Which recipe should she make? Explain your thinking.

3. Is the relationship between number of servings and total amount of sugar proportional for each recipe? Explain your thinking.

Activity 2: Adjusting a Recipe

1. Jamar is making Recipe B for his family. Determine how much of each ingredient he needs for one serving.

Recipe B
Number of Servings: 1
_____ lb. of peaches
_____ cup(s) of butter
_____ cup(s) of flour
_____ cup(s) of sugar
_____ tsp. of lemon juice

2.1 He wants to make just enough for 3 adults and 3 children. The children will eat less than the adults. How many servings should Jamar make? _____

Use the serving size you chose to adjust Recipe B.

Recipe B
Number of Servings: _____
_____ lb. of peaches
_____ cup(s) of butter
_____ cup(s) of flour
_____ cup(s) of sugar
_____ tsp. of lemon juice

2.2 Jamar has a measuring spoon that is $\frac{1}{8}$ teaspoon. How many spoonfuls of lemon juice does he need to make this recipe?

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Unit 7.4, Lesson 2: Peach Cobbler Name(s) _____

Lesson Synthesis

Mohamed's vegetable soup recipe calls for $\frac{1}{3}$ of a cup of carrots for every $\frac{1}{5}$ of a liter of soup.

Haru's soup calls for $\frac{7}{8}$ of a cup of carrots for every $\frac{1}{3}$ of a liter of soup.

What are some strategies we can use to show that Haru's soup will have more carrots per liter than Mohamed's soup?

Cool-Down

Whose lemonade mixture tastes stronger? Explain your thinking.

Aba mixes $2\frac{1}{2}$ cups of water with $\frac{1}{3}$ of a cup of lemon juice.

Esteban mixes $1\frac{2}{3}$ cups of water with $\frac{1}{4}$ of a cup of lemon juice.

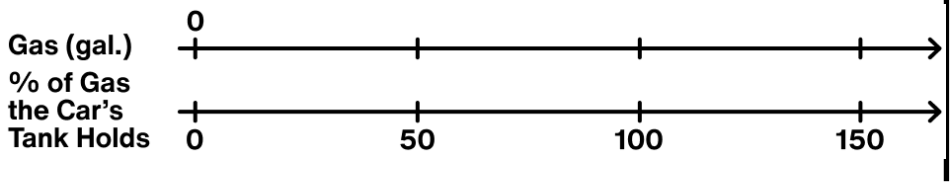
Unit 7.4, Lesson 6: 100% Name _____

Activity 1: Double Number Lines

For each problem, fill in missing values on the double number line diagram to show the percentages that correspond to the original amount and to the new amount. Then answer the question.

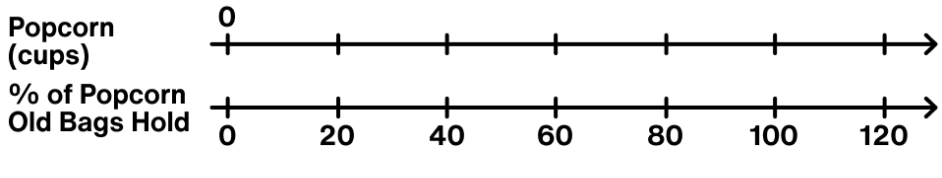
1. The gas tank in a car holds 12 gallons. The gas tank in a truck holds 50% more. How much gas does the truck's tank hold?

Complete the diagram. **Answer the question.**



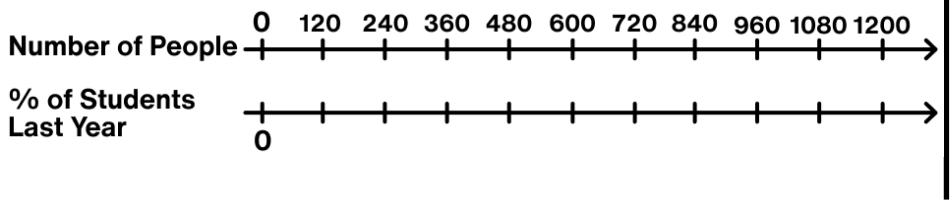
2. At a movie theater, the size of popcorn bags decreased by 20%. If the old bags held 15 cups of popcorn, how much do the new bags hold?

Complete the diagram. **Answer the question.**



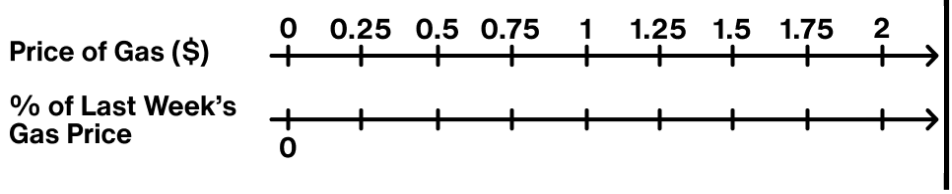
3. A school had $1\,200$ students last year and only $1\,080$ students this year. What was the percent decrease in the number of students?

Complete the diagram. **Answer the question.**



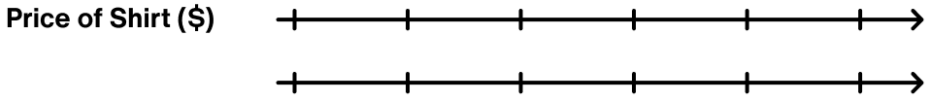
4. Last week, gas was $\$1.25$ per gallon. This week, gas was $\$1.50$ per gallon. By what percent did the price increase?

Complete the diagram. **Answer the question.**



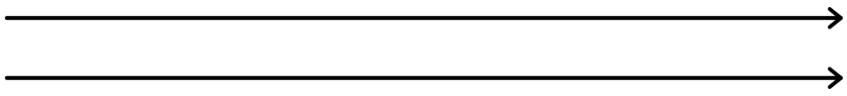
5. After a 20% discount, the price of a T-shirt is $\$24$. What was the price before the discount?

Complete the diagram. **Answer the question.**

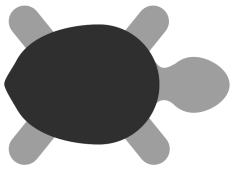


6. The population of Boom Town has increased 25% since last year. The population is now $6\,600$. What was the population last year?

Complete the diagram. **Answer the question.**



Activity 2: Green Sea Turtles



Some beaches where green sea turtles come ashore to lay eggs have been made protected sanctuaries so the eggs will not be disturbed.

This year, there were 234 nesting turtles at a sanctuary. That number is a 10% decrease compared to last year.

Create each representation to show how many nesting turtles were at the sanctuary last year.

Double Number Line	Table	Equation

How many nesting turtles were at the sanctuary last year?

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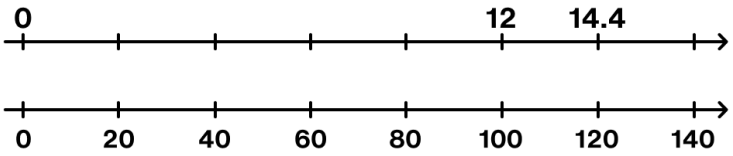
Unit 7.4, Lesson 6: 100% Name _____

Lesson Synthesis

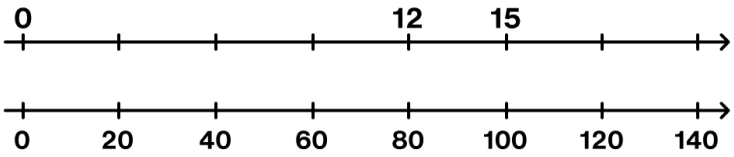
Abdullah and Kanna are working on the same problem:

A juice box has 20% more juice in its new packaging. The original packaging held 12 fluid ounces. How much juice does the new packaging hold?

Abdullah's double number line:



Kanna's double number line:



Whose double number line is correct?

Explain or show your reasoning.

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Unit 7.4, Lesson 6: 100% Name _____

Cool-Down

A company claims that their new bottle holds 40% more laundry soap.

If their original container held 53 fluid ounces of soap, how much does the new container hold?

Unit 7.4, Lesson 9: Minimum Wage Name _____

Activity 1: Waiting Tables

Here is information about four servers who work at different restaurants: Laila, Tiana, Peter, and Julian. Select one of these people below. Make sure each group member selects a different person.

☐ **Laila** is 35 years old. She is married and has two children. She has worked at the same restaurant for 7 years. She works 40 hours per week and makes $2.13 per hour. In a typical week, she serves 75 tables. The average bill at the restaurant is $41 per table, and she typically receives an 18% tip.	☐ **Tiana** is 25 years old. She lives with a roommate and a dog. She has worked at a fancy restaurant for 6 months. She works 40 hours per week and makes $2.13 per hour. She usually serves 45 tables per week. The average bill at the restaurant is $130 per table, and she typically receives a 20% tip.
☐ **Julian** is 29 years old. He lives in Virginia with his 3-year-old son. He just finished his third year as a server. He works 40 hours per week and makes $2.13 per hour. In a typical week, he serves 95 tables. The average bill at the restaurant is $22 per table, and he typically receives a 15% tip.	☐ **Peter** is 19 years old. He lives at home with his parents and goes to college part-time. He recently started as a server, working 40 hours per week. Where Peter lives, the minimum wage for tipped and non-tipped employees is $7.25 per hour. In the average week, he serves 90 tables whose typical bill is $21 with an average tip of 15%.

With the support of your group, answer the questions below for the person(s) you selected.

1. How much money does your person make in a typical week?

2. Suppose people at the restaurant increase their tipping percentage by 5 percentage points (for example, 18% becomes 23%).

How much would your person make now?	By what *percent* would their pay increase?

3. Discuss the following with your group:
   - Which of the four people makes the most money?
   - Whose pay increases by the highest percentage when the tips increase by 5%?
   - Do you think the way we pay servers in these examples is fair? Why or why not?

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Unit 7.4, Lesson 9: Minimum Wage Name _____

Activity 2: What's Fair?

1. Some restaurants have experimented with a different approach to paying servers. One approach is that servers would make $\$15$ per hour, but are not allowed to accept tips.

   Which of the four people do you think would be happy with this approach? Why?

2. Consider these three approaches to paying servers that we have seen so far:

   A. Servers get paid $\$2.13$ per hour, plus tips.
   B. Servers get paid $\$7.25$ per hour, plus tips.
   C. Servers get paid $\$15$ per hour, with no tips.

   Invent and describe a system to determine a server's pay that you think is fairer than the ones above. Calculate what each of the four people would earn under your system.

Are You Ready for More?

Danny Meyer owns 15 restaurants in New York City. In 2015, he announced that tipping would be eliminated at his restaurants, while the price of menu items would increase by 20%. Using a search engine, find and read at least one article about this (for instance, search "Danny Meyer tipping").

After reading, answer this question on a separate sheet of paper: *If you owned a restaurant, would you ban tipping? Why or why not?*

Lesson Synthesis

Describe how you can determine how much a restaurant server makes in a week.
Be as specific as you can.

Cool-Down

Tariq works as a server making $\$9$ per hour. In a typical 8-hour shift, he earns $\$65$ in tips.

The restaurant offers Tariq a 50% raise on his hourly rate. If he takes the offer, he would have to stop collecting tips.

If you were Tariq, would you accept this offer? Why or why not.

Unit 7.4, Lesson 12: Posing Percent Problems Name(s) _____

Activity 1: Stronger and Clearer Each Time

Select the topic that interests you. Then, write two questions about the topic that you could figure out using this information and whose answer is not already given.

As you are drafting questions, ask yourself:

- *Would the answer to this question be interesting or useful?*
- *Can you answer this question using only the information given?*
- *Is the answer to the question not obvious from the information?*

First Draft of Both Questions	
Conversation Notes #1	**Conversation Notes #2**
Final Version of Both Questions	

Activity 2: Make a Poster

Create a poster. Here is what your poster should include:

- ☐ A descriptive title.
- ☐ The two questions you asked.
- ☐ At least one representation of the situation (tape diagram, double number line, table, equation).
- ☐ Your answers to each question (with units).
- ☐ An explanation of how you calculated each answer.
- ☐ Two new questions that you have about this topic after analyzing the data.

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Unit 7.4, Lesson 12: Posing Percent Problems Name(s) _____

Activity 2: Synthesis

Which representation(s) did you find most useful for answering the question you wrote?

Explain your thinking.

Activity 3: Gallery Tour

What features of your classmates' posters helped you understand their thinking?	Describe something you would change about your poster now that you have seen other groups' work.

Activity 4: Revisions and Reflection

1. Use your thinking from the Gallery Tour to make your poster stronger and clearer.
2. Add at least one other representation (tape diagram, double number line, table, equation) to your poster.
3. Individually, answer the questions below.

What did you learn about the wage gap and prison populations that was surprising or new?	What new questions do you have about these topics after seeing the work of other groups?

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Unit 7.4, Lesson 12: Posing Percent Problems Name(s) _____

Lesson Synthesis

How can the math we learned in this unit help us answer questions about the world we live in?

Cool-Down

Here are two facts.

1. Write a question that you could figure out using this information and whose answer is not already given.

2. Answer your question.

In 2010, the number of wild tigers in the world reached an all-time low of $3\ 200$.

Since 2010, the wild tiger population has been growing about 3.6% per year.

Source:
World Wildlife Foundation, "For the first time in 100 years, tiger numbers are growing"

Information Sheet

Wage Gap

The average White man in America earned $\$60\,388$ in 2017 and $\$58\,879$ in 2000.

In America between 2000 and 2017, Black women's earnings increased by 2.57% on average to $\$36\,735$.

In 2017, the average White woman in America earned about 23% less than the average White man.

In 2000, the average White woman in America earned $\$42\,591$.

Compared to the average White man, the average Black man in America earned 27% less in 2000 and 30.3% less in 2017.

Prison Populations

In 2018, the prison population of India was about $466\,000$. In 1986, the prision population was 64% less than that.

China's population is currently 1.4 billion people, closely followed by India with 1.3 billion. Together, they make up 37% of the world's population.

Between 1986 and 2018, China's prison population increased from about 1.2 million to 1.71 million.

There are about 328.2 million people living in the United States.

In 1986, the U.S. prison population was about $546\,600$. By 2018, the U.S. prison population had increased by 321%.

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Unit 7.4, Lesson 12: Supplement Name(s) _____

Activity 1: Stronger and Clearer Each Time

Select the topic that interests you. Then, write two questions about the topic that you could figure out using this information and whose answer is not already given.

As you are drafting questions, ask yourself:

- *Would the answer to this question be interesting or useful?*
- *Can you answer this question using only the information given?*
- *Is the answer to the question not obvious from the information?*

First Draft of Both Questions	
Conversation Notes #1	**Conversation Notes #2**
Final Version of Both Questions	

Activity 2: Make a Poster

Create a poster. Here is what your poster should include:

- ☐ A descriptive title.
- ☐ The two questions you asked.
- ☐ At least one representation of the situation (tape diagram, double number line, table, equation).
- ☐ Your answers to each question (with units).
- ☐ An explanation of how you calculated each answer.
- ☐ Two new questions that you have about this topic after analyzing the data.

Unit 6.7, Lesson 3: Number Cards

$\frac{1}{7}$	$-\frac{1}{7}$
1	-1
$+\ 9.2$	-9.2
$\frac{2}{5}$	-0.4

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Unit 6.7, Lesson 3: Number Cards

$\frac{6}{7}$	$-\frac{6}{7}$
9.02	-9.02
$+\ 5$	-5
$+\ 1.25$	$-\frac{5}{4}$

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Unit 6.7, Lesson 3: Number Cards

$2\frac{2}{3}$	$-\frac{8}{3}$
$+\ 2$	-2
$+\ 1.5$	$-1\frac{1}{2}$
2.5	$-2\frac{1}{2}$

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Unit 6.7, Lesson 3: Number Cards

$+ 2.01$	$- 2.01$
3	-3
$\frac{1}{3}$	$-\frac{1}{3}$
2.10	-2.10

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Unit 6.7, Lesson 3: Order in the Class Name _____

Activity 1: Greater Than?

My number: _____

Round 1

_____'s number: _____ _____ is greater than _____. _____ > _____
(Name)

Round 2

_____'s number: _____ _____ is greater than _____. _____ > _____
(Name)

Round 3

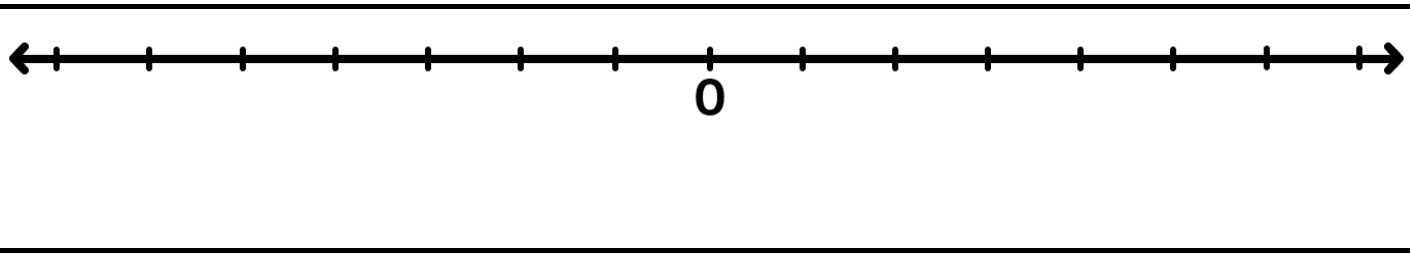
_____'s number: _____ _____ is greater than _____. _____ > _____
(Name)

Activity 2: Least to Greatest

Round 4

_____ < _____ _____ > _____ _____ < _____

Round 5



Round 6

Least _____ _____ _____ _____ **Greatest**

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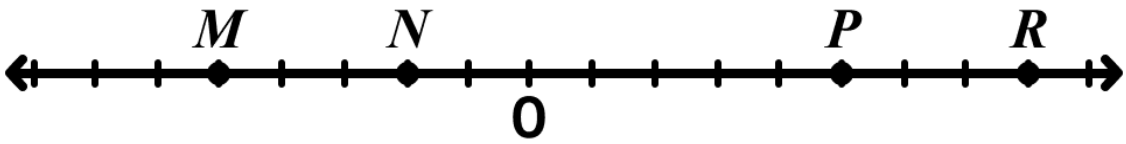
Unit 6.7, Lesson 3: Order in the Class Name _____

Lesson Synthesis

Use the number line to complete each sentence.



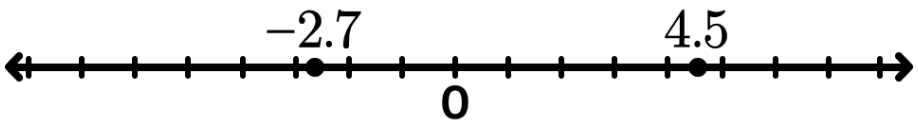
1. ____ is the opposite of ____ because . . .

2. ____ is greater than ____ because . . .

3. ____ is the least of the numbers because . . .

Cool-Down

1. Write a sentence comparing the two numbers shown on the number line.



2. Order these numbers from least to greatest.

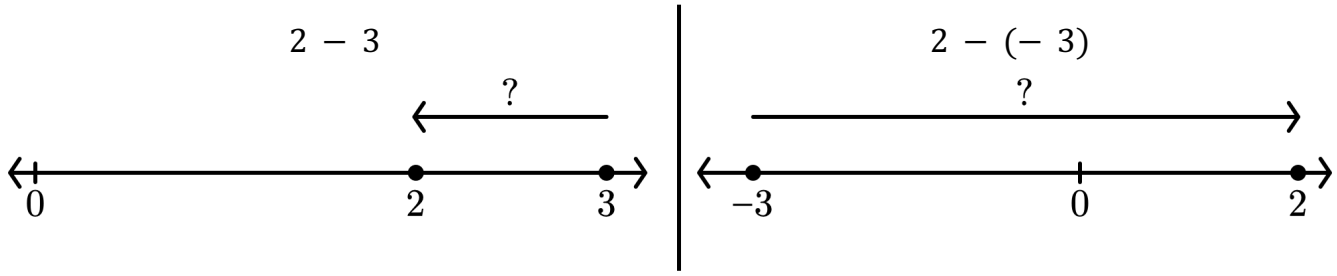
-3 3.1 -2.5 2.5 $\frac{1}{4}$

Least _____ _____ _____ _____ _____ **Greatest**

Unit 7.5, Lesson 4: Draw Your Own Name(s) _____

Activity 1: Draw Your Own Diagram

1. Renata drew a number line diagram to help her think about Problems 3 and 4 from the warm-up. Explain how you think Renata drew each number line.



Renata's strategy:

For each expression, draw a number line diagram and determine its value.

2.1 $7 - 4 =$_____

2.2 $-3.5 - (-2) =$_____

$4 - 7 =$_____

$-2 - (-3.5) =$_____

2.3 $3 - (-9) =$_____

2.4 $(-1.2) - (3.6) =$_____

$(-9) - 3 =$_____

$(3.6) - (-1.2) =$_____

3. Describe 2–3 patterns you noticed about the number line diagrams or their values.

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Unit 7.5, Lesson 4: Draw Your Own Name(s) _____

Activity 2: Draw Your Own Conclusion

1. Record your thinking for the statement your teacher displays. Use examples, words, or number line diagrams to support your claim.

   This statement is (always / sometimes / never) true.

   My reasoning:

2. Select one of these statements. Explain whether it is always, sometimes, or never true. Use examples, words, or number line diagrams to support your claim.

Statement A	**Statement B**	**Statement C**
$x + 1$ is positive.	$x + 1$ is more than $x - 1$.	$x + (-x)$ is positive.

   Statement ____ is (always / sometimes / never) true.

   My reasoning:

3. Select one of these statements. Explain whether it is always, sometimes, or never true. Use examples and number line diagrams to support your explanation.

Statement D	**Statement E**	**Statement F**
$x - y$ is the opposite of $y - x$.	x is less than $x + y$	$x - y$ is greater than $x + y$.

   Statement ____ is (always / sometimes / never) true.

   My reasoning:

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Unit 7.5, Lesson 4: Draw Your Own Name(s) _____

Are You Ready for More?

Challenge your classmates. Write your own statement similar to the ones above that is either **always** or **never** true. Then trade statements with a classmate and decide if their statement is always or never true.

Lesson Synthesis

What happens to the value of a subtraction expression when you rearrange the order of the numbers? Use the examples in the box if they help you with your explanation.

$7 - 4$ and $4 - 7$
$-2 - (-3.5)$ and $-3.5 - (-2)$

Cool-Down

For each expression, draw a number line diagram and determine its value.

$-2.3 - (-3.5) =$

$-2.3 + (-3.5) =$

Unit 7.5, Lesson 10: Integer Puzzles (Supplement) Name(s) _____

Puzzle Workspace

Use this space to record all of your attempts and thinking as you work on each puzzle.
After each attempt, consider what you learned and how your strategy might change on the next attempt.

Puzzle #1

Puzzle #2

Reflection on Puzzles 1 and 2

Use this space to record things you learned while solving these puzzles, including advice to yourself or others.

Puzzle Workspace Continued

Puzzle #3

Puzzle #4

Are You Ready for More?

Reflection on Puzzles 3 and 4

Use this space to record things you learned while solving these puzzles, including advice to yourself or others.

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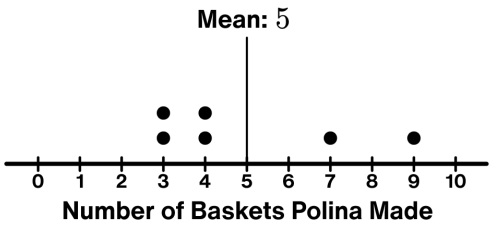
Unit 6.8, Lesson 9: Supplement Name _____

Polina's Data

Number of Baskets	3	3	4	4	7	9
Absolute Deviation (distance from __5__ mean)	2	2	1	1	2	4



Mean Absolute Deviation (MAD)

Sum of absolute deviations:

2 + 2 + 1 + 1 + 2 + 4 = 12

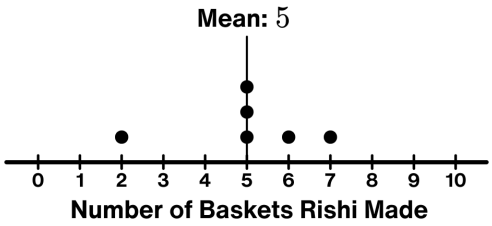
Average or mean of the absolute deviations:

12 ÷ 6 = 2

Rishi's Data

Number of Baskets	2	5	5	5	6	7
Absolute Deviation (distance from _____ mean)						

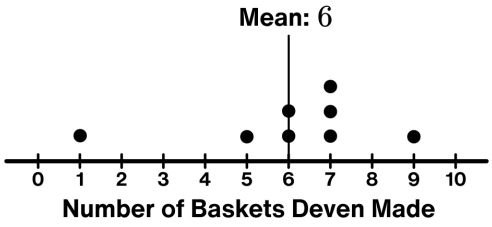
Mean Absolute Deviation (MAD)



Deven's Data

Number of Baskets	1	5	6	6	7	7	7	9
Absolute Deviation (distance from _____ mean)								

Mean Absolute Deviation (MAD)



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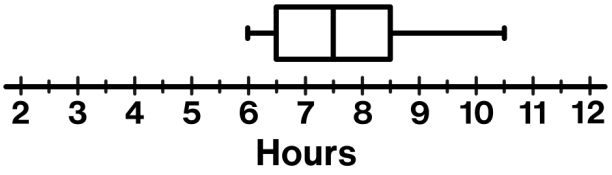
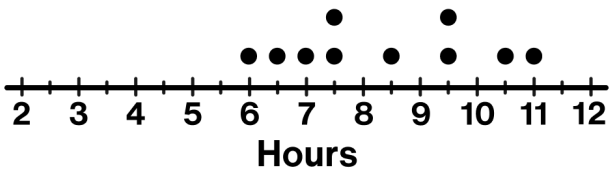
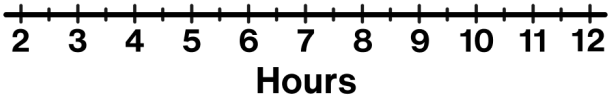
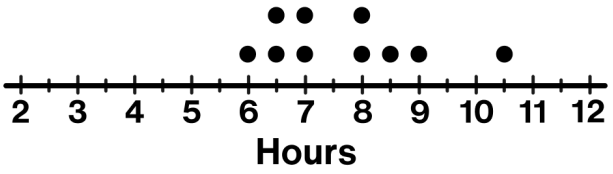
Unit 6.8, Lesson 14: Cards







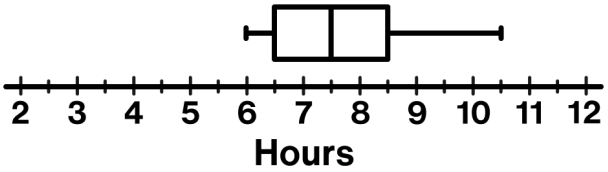


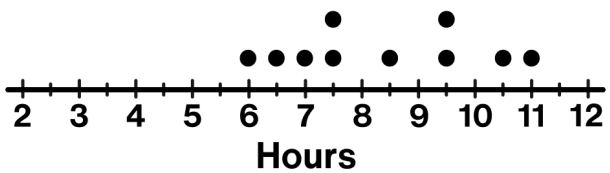
4.5 hours

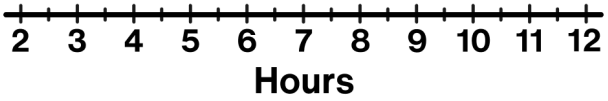
5 hours

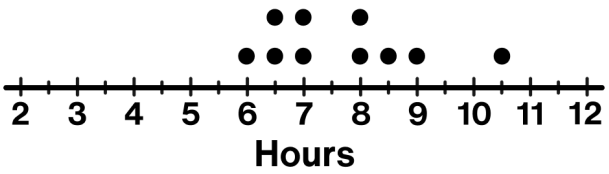
7.5 hours

2.5 hours









4.5 hours

5 hours

7.5 hours

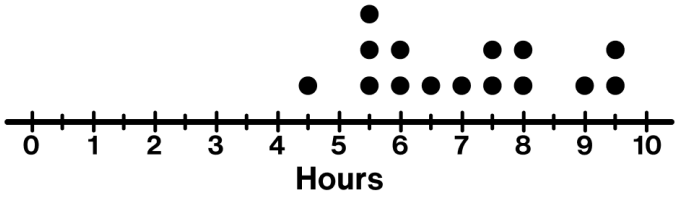
2.5 hours

Unit 6.8, Lesson 14: Car, Plane, Bus, or Train? Name _____

Warm-Up

Jalen recorded how long it took to drive from St. Louis to Chicago the last 15 times his family went.

1. Determine Q1, Q2, and Q3. Label them on the dot plot.

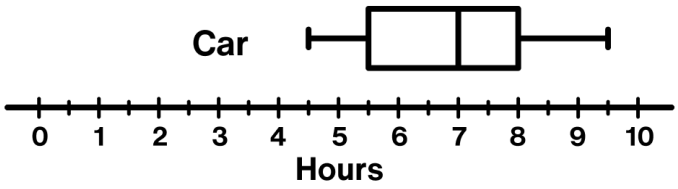


Your teacher will show you an animation.

2.1 Discuss with a partner: *What do you notice? What do you wonder?*

2.2 Label each of these words on the box plot.

- ☐ Minimum (Min.)
- ☐ Quartile 1 (Q1)
- ☐ Quartile 2 (Q2)
- ☐ Quartile 3 (Q3)
- ☐ Maximum (Max.)



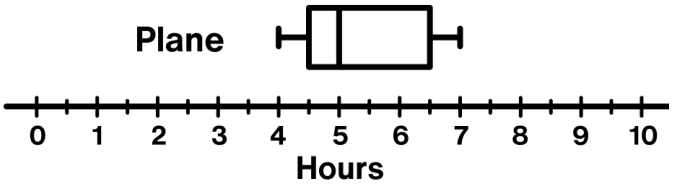
Activity 1: Car or Plane?

Jalen's family is considering going by plane for their next trip to Chicago.

Jalen's family has made the trip by plane before. Here is a box plot representing those travel times.

1. Determine each statistic for the plane data.

- Minimum: _____
- Quartile 1: _____
- Median: _____
- Quartile 3:_____
- Maximum: _____



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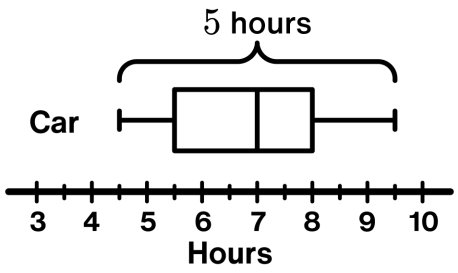
Unit 6.8, Lesson 14: Car, Plane, Bus, or Train?

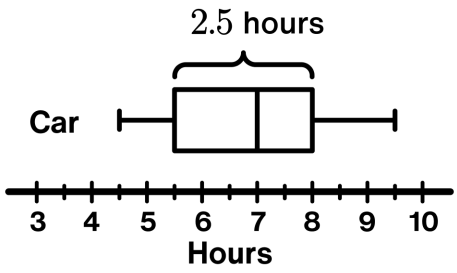
Jalen's family is interested in the spread of the data for car and plane times.

There are two ways to describe the spread of a box plot.

The *range* is the distance from the minimum to the maximum.



The *interquartile range (IQR)* is the distance from Q1 to Q3.



2. Read the definitions above.

   How are range and IQR similar?

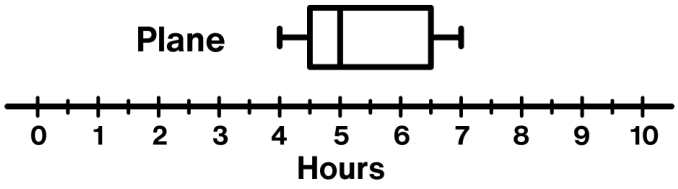
   How are they different?

3. Jalen says that one of these is like the size of the middle half.
   Which measure of spread do you think he is talking about? Explain your reasoning.

4. For the plane data, what is the:

   Range: _____

   IQR: _____



5. Based on this data, would you recommend Jalen's family go by car or by plane next time?
   Explain your reasoning.

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Unit 6.8, Lesson 14: Car, Plane, Bus, or Train?

Activity 2: Bus or Train?

1. Jalen's family has also gone to Chicago by bus and by train. Help them complete the table.

	Bus	Train
Travel Times (hours)	7.5, 10.5, 9.5, 9.5, 6 7, 6.5, 7.5, 11, 8.5	6.5, 8.5, 6, 10.5, 6.5 8, 7, 7, 9, 8
Dot Plot		
Box Plot		
Median		
IQR		
Range		

2. Which mode of transportation (car, train, bus, plane) would you recommend for Jalen's family? Use evidence to support your argument.

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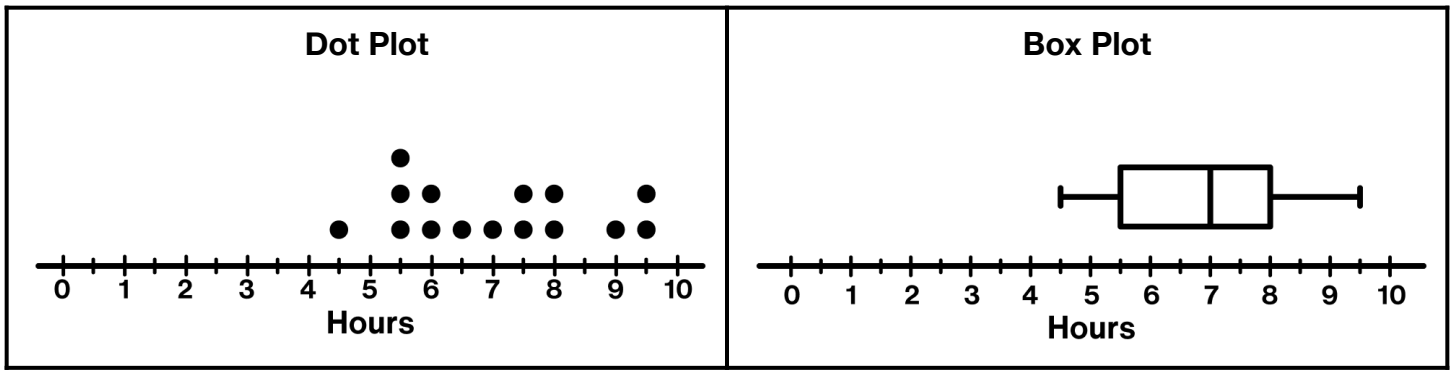
Unit 6.8, Lesson 14: Car, Plane, Bus, or Train?

Lesson Synthesis

Here is a dot plot and a box plot of Jalen's data for traveling by car.



Which (**dot plot** or **box plot**) would you use to determine:

The median? The number of data points? The range? The IQR?

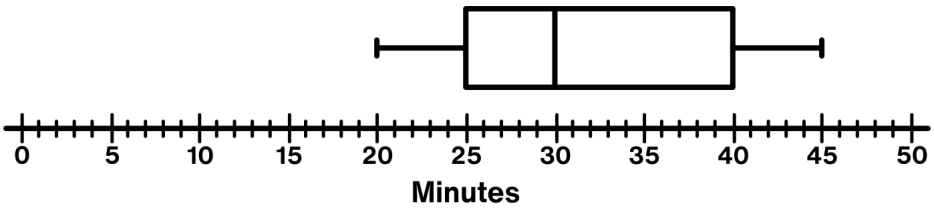
Cool-Down

Inola took the bus to school most days in January.

She wrote down how many minutes it took to get to school each day and made a box plot.

For this data, what is the:

- Median: _____
- IQR: _____
- Range: _____

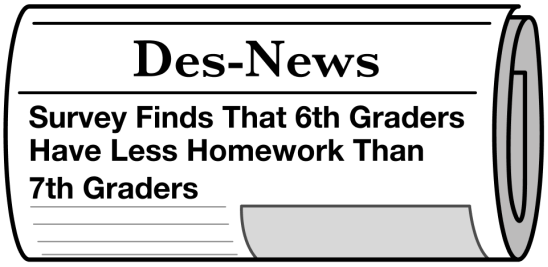


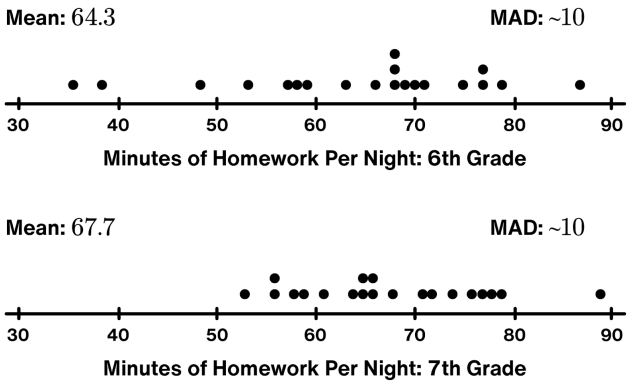
Unit 7.8, Lesson 14: School Newspaper Name(s) _____

Activity 1: Homework Headline

Students at Median Middle School are investigating issues for the school newspaper. They survey an equal number of randomly selected 6th and 7th graders from their school of 500 students.

Here are the results of the survey and a headline based on the results.





Based on this data . . .

1.1 Why might someone believe this headline?

1.2 Why might someone **not** believe this headline?

2. Wohali and Ama use different strategies to decide if they believe the headline.

Wohali says:	**Ama says:**
I believe the headline because the mean of the 6th grader's data is 3.4 minutes less than the mean of the 7th grader's data.	I don't believe the headline. Even though the mean is 3.4 minutes less, 3.4 minutes isn't a big difference. It's less than one MAD!

Who do you agree with? Explain your thinking.

3. The survey results for 8th graders show a mean of 85 minutes and a MAD of 10 minutes. What would Ama say about whether 8th graders have more homework than 7th graders?

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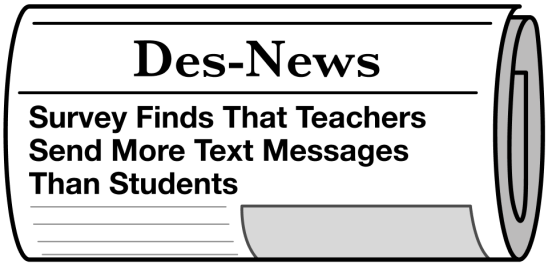
Unit 7.8, Lesson 14: School Newspaper Name(s) _____

Activity 2: Texting Title



	Number of Texts Sent Per Day
Students	0, 3, 5, 10, 20, 30, 100
Teachers	2, 20, 30, 45, 50, 50, 90

Based on this data . . .

1.1 Why might someone believe this headline?

1.2 Why might someone **not** believe this headline?

2. Use Ama's strategy to calculate how many MADs apart the means are.

3. Do your calculations make you believe the headline more or less? Explain your thinking.

Nikhil calculated the median instead of the mean and is wondering if he can still use Ama's strategy. Ama says he can but should use the IQR instead of the MAD.

4.1 Calculate the median and IQR of each data set.

4.2 How many IQRs is the difference between the medians?

5. Do your calculations make you believe the headline more or less? Explain your thinking.

Activity 3: Write Your Own

Your teacher will give you a supplement with four data sets from Median Middle School.
Select one data set to investigate. Make sure each group member selects a different data set.

1. Describe what your data set is about.

With the support of your group, answer the questions below based on the data set you selected:

2. Write a headline that could be true about students at Median Middle School.

3. Explain why readers should believe this headline.
   Use at least two pieces of evidence to support your claim.

4. Discuss the following with your group:
   - For which issues is there a **big difference** based on Ama's strategy? How do you know?
   - For which issues is there **no big difference** based on Ama's strategy? How do you know?
   - How did you decide whether or not there was a big difference?

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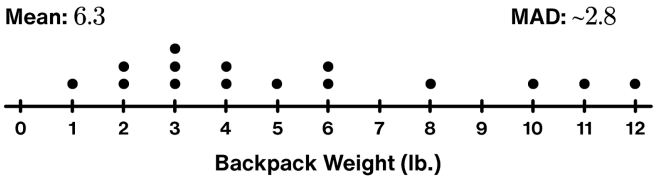
Unit 7.8, Lesson 14: School Newspaper Name(s) _____

Lesson Synthesis

Describe how you can use the MAD to decide how different two populations are.

Use the data from Median Middle School if it helps you with your thinking.

6th Graders



8th Graders: Backpack Weight (lb.)

10, 11, 11, 12, 13, 13, 14, 14, 15, 15, 16, 18, 18, 20, 22

Cool-Down

Caasi wonders if students watched more movies than teachers over the winter break.

After collecting data from a random sample of 11 students and 11 teachers, she decides that the difference between the number of movies watched isn't that big.

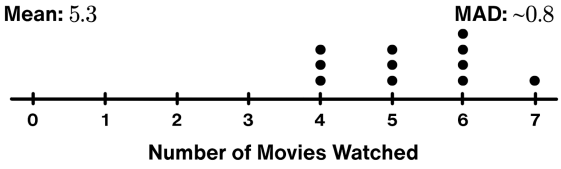
Do you agree with Caasi?

Use at least two pieces of evidence to support your claim.

Teachers

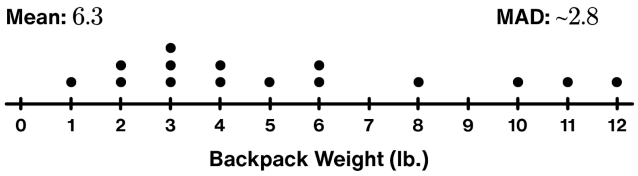
1, 2, 2, 2, 3, 3, 3, 3, 4, 5, 5

Students



Backpack Weights: This data shows the weight of backpacks (in pounds) for a random sample of 6th and 8th graders at Median Middle School.

6th Graders



8th Graders

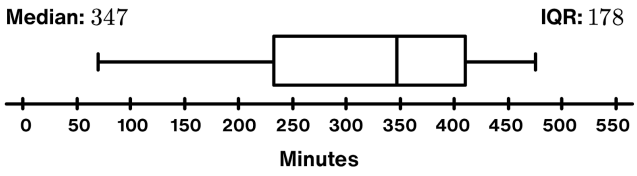
10, 11, 12, 13, 13, 14, 15, 16, 18, 23

Cell Phone: This data shows the number of minutes of cell phone use last week for a random sample of 6th and 8th graders at Median Middle School.

6th Graders

70, 160, 230, 260, 260, 310, 350, 360
360, 410, 410, 440, 440, 460, 530

8th Graders

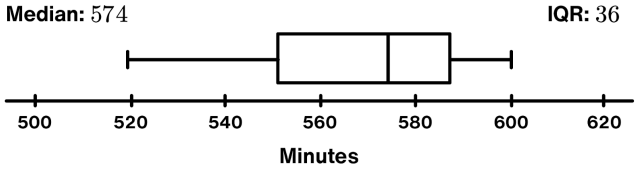


Online Videos: This data shows the number of hours of online videos watched last year for a random sample of students and teachers at Median Middle School.

Students

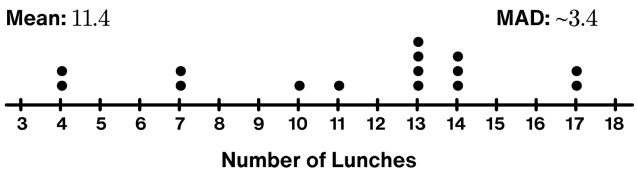
560, 570, 590, 590, 590, 600, 610, 610
610, 620, 620, 630, 630, 630, 650

Teachers



Hot Lunch: This data shows the number of days last month that hot lunch was purchased by a random sample of 6th and 7th graders at Median Middle School.

6th Graders



7th Graders

0, 9, 12, 13, 14, 14, 15, 16, 17, 17