



SUMMER ESSENTIALS

MATH 7 HONORS PRACTICE BOOK Grade 7



Name: _____

Welcome to your Summer Essentials Practice Book! This book is designed to support your learning this summer during the weeks of June 29 - July 31. In this book you will have opportunities to:

- Practice and apply mathematics skills from the past school year
- Engage in open-ended creative tasks through Learning Quests

This practice book provides suggested mathematics learning activities for you to complete each weekday over the next five weeks. Take a few moments to look at the calendar on page 2 and explore the book with your family. An answer key is provided at the end of each week so that you can check your answers. Learning Quests are included for you at the end of the book. You can complete the quests and share your learning with family and friends. As you use this book, keep in mind:

- Practice books reinforce the most important skills needed for your next math course. It is recommended that you engage in this review this summer; practice books will not be collected or graded.
- Practice books are posted to FCPS 24/7 Learning Blackboard for families.
- You have the opportunity to attend one virtual office hour each week with a teacher from your school. Office hours are optional and give you the chance to receive help with the content in this practice book. Please contact your school if you have questions about office hour details.

Usen este enlace para obtener la información en español.

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استخدم هذا الرابط للوصول إلى المعلومات باللغة العربية.

请使用本链接获得中文信息。

از طریق این لینک برای دسترسی به این اطلاعات به زبان فارسی استفاده کنید.

이러한 정보를 한국어로 확인하려면 다음 링크를 이용하기 바랍니다.

اردو زبان میں معلومات حاصل کرنے کے لیے، یہ لنک استعمال کریں

Hãy dùng liên kết này để truy cập thông tin này bằng tiếng Việt :

Message to families: <https://www.fcps.edu/node/41224>

Weekly Calendar

This calendar suggests practice activities for students to do each day. Every student works at a different pace. Please customize to meet the needs of your child and consider participating in Office Hours provided by your school as an additional support.

Monday	Tuesday	Wednesday	Thursday	Friday
Week 1: Consumer Applications, Square Roots and Evaluating Expressions				
June 29 Percent Word Problems Pages 3-4	June 30 Square Roots Pages 5-6	July 1 Expressions with 2 Variables Pages 6-7	July 2 Consumer Math Page 8	July 3 Weekly Reflection Page 8
Week 2: Solving Equations and Inequalities				
July 6 Solving Multistep Equations Pages 10-11	July 7 Applications of Multistep Equations Pages 11-12	July 8 Solving Inequalities Pages 12-13	July 9 Applications Pages 13-14	July 10 Weekly Reflection Page 15
Week 3: Linear Functions				
July 13 Functions and Relations Pages 17-18	July 14 Slope and y-intercept Pages 18-20	July 15 Graphing Linear Equations Pages 20-21	July 16 Connections and Review Pages 21-22	July 17 Weekly Reflection Pages 22-23
Week 4: Pythagorean Theorem				
July 20 Introduction to Pythagorean Theorem Pages 24-25	July 21 Find the Missing Hypotenuse Pages 25-26	July 22 Find a Missing Side of a Right Triangle Pages 27-28	July 23 Application Pages 28-29	July 24 Weekly Reflection Page 30
Week 5: Scatterplots				
July 27 Constructing a Scatterplot Pages 31-32	July 28 Scatterplot Application Pages 32-33	July 29 Line of Best Fit Pages 33-34	July 30 Review Pages 34-35	July 31 Weekly Reflection Pages 35-36

This practice book also contains an Inquiry Quest on pages 37-39 as well as information about COVID-19 on page 40.

Consumer Applications, Square Roots and Evaluating Expressions

Weekly Learning Outcomes:

- I can evaluate and estimate square roots, solve practical problems using tax, tip, and discount.
- I can evaluate algebraic expressions.

Day 1

Number Routine

Using the digits 1 to 6, at most one time in each row, fill in the boxes to create a true statement with the smallest possible interval.

$$\square.\square\square < \sqrt{2} < \square.\square\square$$

$$\square.\square\square < \sqrt{3} < \square.\square\square$$

$$\square.\square\square < \sqrt{4} < \square.\square\square$$

Teaching

Optional Video: Percent Word Problems <https://bit.ly/2X65nm3> Today, we will be reviewing a topic from earlier in the year, consumer applications. **In this lesson, we will represent real-world situations with consumer applications.**

Write each phrase in the bubble below that best describes it: **tax, tip, discount, mark up, commission, credit, sale price, selling price, discounted price, total, debit, final balance**

An amount that can be added	An amount that can be subtracted	Describes the final amount

Let's look at an example.

Gilmer wants to buy a pair of shoes that normally cost \$45 but are on sale for 25% off. Determine the sale price of the shoes.

There are many ways to solve this problem. Some ways could be to use a proportion, use an equation, or use a calculator to multiply a decimal by the price. Solve the problem any way you'd like.

Here is an example of solving with a proportion:

$$\frac{\text{discount}}{\text{original price}} = \frac{x}{100} = \frac{25}{100}$$

$$\frac{100x}{100} = \frac{1125}{100}$$

$$x = 11.25$$

Original Amount	Add or subtract	Amount of tax, tip, markup, discount, etc.	=	Final Amount
\$45.00	-	\$11.25		\$33.75

Let's look at another example:

Savannah had 40 coins in her piggy bank. Her brother took 26 coins to add to his piggy bank. What is the percent of change in the number of coins in Savannah's piggy bank?

$$\frac{\text{new amount} - \text{original amount}}{\text{original amount}} \times 100$$

$$\frac{26 - 40}{40} \times 100$$

$$-35\%$$

And one last example:

Find the simple interest after 6 years on an account with an amount of \$5600 with a rate of 4.5%.

$$I = prt$$

$$I = (5600)(0.045)(6)$$

$$I = 1485$$

Application

<p>1. Gregory wants to buy a new video game system priced at \$179.00. If the sales tax is 6%, what is the total amount he will pay for the video game system?</p>	<p>2. A stereo was originally priced at \$75.50. It was marked down 24%. A store had a big sale of "60% off the lowest marked price". What was the final price of the stereo?</p>
<p>3. Alyse deposited \$5,730 in a bank account that earns 2.5% interest. If she did not deposit or withdraw any money in 5 years how much interest did she earn?</p>	<p>4. In 2018, each share of Flixnet stock was worth \$391. Today each share of Flixnet stock is \$298. What is the percent change in the price of Flixnet stock?</p>

Check & Reflect: Use page 9 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 2
Number Routine

Using the digits 1 to 8, at most one time each, fill in the boxes to create the following number types:

<div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto; border-bottom: 3px double black;"></div>	Rational Number that can be classified as an integer	$\sqrt{\square}$	Produces a number that can be classified as a Rational Number	<div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto; border-bottom: 3px double black;"></div>	Rational Number that produces a terminating decimal	<div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto; border-bottom: 3px double black;"></div>	Rational Number that produces a repeating decimal	$\sqrt{\square}$	Produces a number that can be classified as an Irrational Number
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Teaching

Optional Video: Introduction to Square Roots <https://bit.ly/3c6pMvu>

Today, we will review a topic from earlier in the year, square root. **In this lesson, we will estimate and determine the two consecutive integers between which a square root lies and determine both the positive and negative square roots of a given perfect square.** You can do this by making a list of the perfect squares from 1 to 400, using a calculator to determine the square root of a number or using grid paper and estimation to determine what is needed to build a perfect square. The square root of a positive number is usually defined as the side length of a square with the area equal to the given number. If it is not a perfect square, the area provides a means for estimation. The symbol $\sqrt{\quad}$ may be used to represent a positive (principal) root and $-\sqrt{\quad}$ may be used to represent a negative root.

Determine the positive or negative square root of the given perfect square.

$$\sqrt{49} = 7 \qquad -\sqrt{121} = -11 \qquad -\sqrt{225} = -15 \qquad \sqrt{400} = 20$$

Estimate and identify the two consecutive integers between which the positive or negative square root of a given number lies. You want your answer to be two integers that follow one another (i.e. 5 and 6).

$$\sqrt{42} = 6 \text{ and } 7 \qquad -\sqrt{15} = -3 \text{ and } -4 \qquad \sqrt{117} = 10 \text{ and } 11$$

Application and Practice

Estimate and identify the two consecutive integers between which the positive or negative square root of a given number lies. Write your answer below the given square root.

$\sqrt{89}$	$\sqrt{399}$	$-\sqrt{110}$	$\sqrt{75}$	$-\sqrt{6}$	$-\sqrt{2}$

Fill in the missing the perfect squares from 1 to 400.

1, 4, 9, _____, 25, 36, _____, _____, 81, 100, 121, _____, _____, _____, 225, _____, 289, _____, _____, _____

Determine the positive or negative square root of the given perfect square.

$\sqrt{25}$	$-\sqrt{289}$	$\sqrt{9}$	$\sqrt{81}$	$-\sqrt{4}$	$\sqrt{169}$

Check & Reflect: Use page 9 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 3

Number Sense Routine: Which one doesn't belong? Find a reason why each one doesn't belong.

9	16
25	43

9 doesn't belong because _____
 16 doesn't belong because _____
 25 doesn't belong because _____
 43 doesn't belong because _____

Teaching

Optional Video: Expressions with 2 variables <https://bit.ly/2Af2B4Q>

Today we will review how to evaluate algebraic expression when given a replacement value; we will also review how to simplify algebraic expressions. Remember, when simplifying expressions, we must follow the order of operations: **Grouping Symbols** → **Exponents/Square roots** →

Multiplication or division (from left to right) → **Addition or Subtraction (from left to right)**

Simplify the following expression: $(-7 + 10 \div 2 \cdot 3) + \sqrt{49}$	
$(-7 + 5 \cdot 3) + \sqrt{49}$	Grouping symbols
$(-7 + 15) + \sqrt{49}$	Grouping symbols
$(8) + \sqrt{49}$	Grouping symbols
$8 + 7 = 15$	Square root, addition

Evaluate: $z^3 - x + 2y$, if $x = -3, y = 5, z = 2$	
$(2)^3 - (-3) + 2(5)$	Replace the variables
$8 - (-3) + 2(5)$	Exponents
$8 - (-3) + 10$	Multiplication
$11 + 10 = 21$	Add and subtract (left to right)

Application and Practice**1. Simplify**

$$\frac{1}{5} \cdot 20 \div 2 + \frac{36}{3} \div 4 \cdot 7$$

2. Simplify

$$\frac{5^2 - 2^2}{3 + 4} - \sqrt{121} + 4^2$$

3. Evaluate when $a = 6$, $b = -5$

$$\frac{1}{2}(3a - 4)(2b + 7)$$

4. Evaluate when $y = -2$

$$\frac{9y}{4} - 3y + 2$$

5. Simplify

$$\sqrt{36} \div 2 + 3^2 + |-7|$$

6. Evaluate when

$$a = -4, b = 5, \text{ and } c = -3$$

$$b^2 - c + 4(3a - b)$$

Check & Reflect: Use page 9 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 4

Additional Practice: Consumer Math

1. Lena took her family out to dinner. The total food bill was \$76.55. She likes to leave an 18% tip. How much did Lena pay for dinner?

2. Vignish’s English class recorded the total number of books read per month. In September, they read 35 books, and in October, they read 47 books. What was the approximate percent of change from September to October?

Square Roots and Perfect Squares

3. Which correctly identifies $\sqrt{7}$?



4. Fill in a whole number to make the statement true.

$$5 < \sqrt{\quad} < 6$$

Evaluating Algebraic Expressions

5. Simplify

$$|-8 + 4| + 2^3 - 20 \div 4 + (-7)$$

6. Evaluate when $x = 4, y = -2$

$$\frac{1}{3}(x^2 - 4)(y^3 + 6)$$

Day 5: Weekly Reflection

Create and solve a problem from each topic this week. Explain how you solved each problem to a family member or friend.

Consumer Math	Square Roots	Algebraic Expressions

Answer Guide

Day 1 Number Routine: $1.36 < \sqrt{2} < 2.45$, $1.65 < \sqrt{3} < 2.34$, $1.65 < \sqrt{4} < 2.34$

Teaching: Amounts that can be added: tax, tip, mark up, commission. Amounts that can be subtracted: discount, credit, debit. Describes the final amount: sale price, selling price, discounted price, total, final balance.

Original Amount	Add or subtract	Amount of tax, tip, markup, discount, etc.	=	Final Amount
\$45.00	-	\$11.25	=	\$33.75

Application: (1) \$189.74 (2) \$22.95. Hint. Find the selling price at 24% off. Use that to find the selling price at 60% off. (3) \$716.25 (4) -23.79%

Day 2 Number Routine: Answers will vary. One solution is: Rational $\frac{8}{2}$ Rational: $\sqrt{1}$ Terminating $\frac{3}{6}$

Repeating: $\frac{4}{7}$ Irrational: $\sqrt{5}$

Application

$\sqrt{89}$	$\sqrt{399}$	$-\sqrt{110}$	$\sqrt{75}$	$-\sqrt{6}$	$-\sqrt{2}$
9 and 10	19 and 20	-11 and -10	8 and 9	-3 and -2	-2 and -1

1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361, 400

$\sqrt{25}$	$-\sqrt{289}$	$\sqrt{9}$	$\sqrt{81}$	$-\sqrt{4}$	$\sqrt{169}$
5	-17	3	9	-2	13

Day 3 Number Routine (answers may vary) 9 doesn't belong because it is a single digit number. 16 doesn't belong because it is not an odd number 25 doesn't belong because it is a friendly percent. 43 doesn't belong because it is not a perfect square.

Application (1)23 (2)8 (3)108 (4) $3\frac{1}{2}$ (5) 19 (6) - 40

Day 4: Additional Practice (1) \$90.33 (2) 34% (3) Between 2 and 3 (4) any whole number larger than 25 but less than 36 (5) 0 (6) -8

Solving Equations and Inequalities

Weekly Learning Outcomes:

- I can solve multistep linear equations with the variable on one or both sides of the equation.
- I can solve practical problems that require the solution of a multistep linear equation.
- I can solve multi-step linear inequalities with the variable on one or both sides of the inequality symbol, including practical problems.
- I can graph the solution of an inequality on a number line.

Day 1

Number Sense Routine

Remember! Grouping symbols include: (), [], ||, $\sqrt{\quad}$

Use grouping symbols to make the equation true:

$$4^2 - 6 \cdot 2 + 1 = 3$$

Teaching

Today we are going to review solving multi-step equations. **To solve an equation, use properties of equality and inverse operations to isolate the variable.** Optional Video: Solving Multi-step Equations <https://bit.ly/2zymTGE>

Example 1: Solve the equation for x .

Equation	What am I thinking about when solving?
$-(5x - 4) = 3 + 2(1 - 4x)$	I notice that I can simplify both sides of the equation. I will distribute -1 on the left side and 2 on the right side.
$-5x + 4 = 3 + 2 - 8x$	I now notice that I can simplify the right side of the equation by combining like terms . $+3$ and $+2$.
$-5x + 4 = 5 - 8x$ $+8x \qquad +8x$	Because there are variables and constants on both sides, I will use the properties of equality to move them. I will first add $8x$ to both sides.
$3x + 4 = 5$ $-4 \quad -4$	Because the left side shows two terms, I will subtract 4 from both sides.
$\frac{3x}{3} = \frac{1}{3}$	Because the left side shows $3 \cdot x$, I will divide by 3 on both sides.
$\frac{3x}{3} = \frac{1}{3}$	I will simplify each side of the equation.
$x = \frac{1}{3}$	Solution.

Example 2: What is the solution to the equation below?

Equation	What am I thinking about when solving?
$\frac{5x + 1}{3} - 3 = -11$	I notice that this equation has two terms, $\frac{5x+1}{3}$ and -3 , on the left side. I need to get $\frac{5x+1}{3}$ by itself first by adding 3 to both sides .
$\frac{5x + 1}{3} = -8$	I notice that this equation has an expression that is a fraction on the left side. I need to eliminate the denominator by multiplying both sides by 3
$5x + 1 = -24$	Since the left side shows two terms, I will subtract 1 from both sides.
$5x = -25$	Since the left side shows $5 \cdot x$, I will divide by 5 on both sides.
$\frac{5x}{5} = \frac{-25}{5}$	Simplify both sides.
$x = -5$	Solution.

Practice: Solve each equation.

1. $\frac{n-2}{6} = -n + 2$	2. $7x + 4 + 2x = 16 + 3x + 42$	3. $5x - 28 = x$	4. $12m = 2(3m - 12)$
5. $\frac{2x+7}{4} - 8 = 10$	6. $3y + 4(2y - 5) = 2$	7. $-3(5n - 1) = 6n$	

Check & Reflect: Use page 16 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 2

Number Sense Routine: Which One Doesn't Belong?

$6 - 3(2x + 1) = 4$	$6 - 6x - 3 = 4$
$3(2x + 1) = 4$	$-3(2x + 1) = -2$

_____ is different because _____.

Teaching

Today, we will apply our skills and knowledge to real-world applications.

Applications of Multi-step Equations

<p>Example: You are planning a birthday party at a local bowling alley. Alley Cats charges \$45 to rent the space and \$8.95 per person. IncrediBowls charges \$77 to rent the space and \$4.95 per person. How many people, p, would attend the party for the cost of each bowling alley to be the same?</p>	
$p = \text{number of people}$	<p>The question asks, "How many people?" Assign a variable, p, for the unknown.</p>
<p>Cost of Alley Cats = Cost of IncrediBowls $45 + 8.95p = 77 + 4.95p$</p>	<p>Identify the information needed to write an equation that shows when the cost of Alley Cats equals the cost of IncrediBowls.</p>
$\begin{array}{r} 45 + 8.95p = 77 + 4.95p \\ -4.95p \quad -4.95p \end{array}$	<p>Solve the equation. There are variables on both sides of the equation, so subtract 4.95p from each side to isolate the variable on one side.</p>
$\begin{array}{r} 45 + 4p = 77 \\ -45 \quad -45 \end{array}$	<p>Subtract 45 from each side.</p>
$\frac{4p}{4} = \frac{32}{4}$	<p>Divide both sides by 4</p>
$p = 8$	<p>Solution. This represents that if 8 people came to the party, the cost of each bowling alley would be the same.</p>

Practice

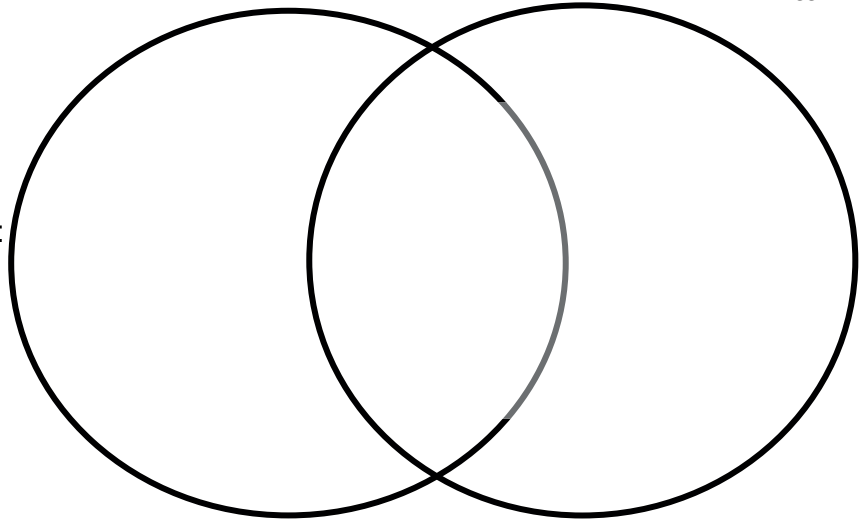
- The 8th grade class is selling cookie dough to raise money. They purchased 1,500 tubes of cookie dough and paid a delivery fee of \$45. The total cost, including the delivery fee, was \$1320. What was the cost of each tube of cookie dough?
- SuperLots charges a monthly fee of \$12.25 and sells gasoline for \$1.95 per gallon. Gas-o sells gasoline for \$2.80 per gallon and charges no fee. How many gallons of gasoline would you have to buy in one month to spend the same amount at either store?

Check & Reflect: Use page 16 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 3

Number Sense Routine




These inequalities are similar because:
 These inequalities are different because:
 $5(2x - 1) < 10$ $5(2x - 1) \leq 10$



Teaching

Solving **inequalities** is a lot like solving equations. An inequality is a mathematical sentence that uses an inequality symbol to compare the values of two expressions. You can use a number line to visually represent the values that satisfy an inequality. Optional Video: Solving Multi-step Inequalities <https://bit.ly/2ZVwx00>

Example 1: Solve and graph your solution.

Inequality	What am I thinking about when solving?
$3(x + 6) - 7x \geq -2(x - 4) + 4$	I notice that I can simplify both sides of the inequality. I will distribute 3 on the left side and -2 on the right side.
$3x + 18 - 7x \geq -2x + 8 + 4$	I now notice that I can simplify both sides of the inequality. On the left side of the inequality, I will combine like terms $3x$ and $-7x$. On the right side of the inequality, I will combine like terms . $+8$ and $+4$
$-4x + 18 \geq -2x + 12$ $+2x \quad +2x$	Since there are variables and constants on both sides, I will use the properties of inequality to move them. I will first add $2x$ to both sides.
$-2x + 18 \geq 12$ $-18 \quad -18$	Since the left side shows two terms, I will subtract 18 from both sides.
$\frac{-2x}{-2} \geq \frac{-6}{-2}$	Now I will divide both sides by -2 .
$x \leq 3$	Remember when you divide or multiply by a negative number you need to flip the inequality symbol .
	Remember, use an open circle  for $<$ or $>$ and a closed circle  for \leq or \geq .

Practice: Solve each inequality. Graph your solutions on the number line.

1. $2 < 3(4x - 5)$

2. $2x - 3 \geq x + 6$

3. $\frac{-2x+6}{8} < 1$

4. $-11 - 7x \leq -1 - 6x - 6$

5. $-4 < -3x + 8$

6. $\frac{7x-2}{5} \leq 8$

7. $-5(2x + 3) < 15$

8. $23 + 8x < 2x + 7(3x - 1)$



Check and Reflect: Use page 16 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 4

Number Sense Routine

Using the integers -4 to 4, at most one time each, to create an inequality with solutions of $x \leq 2$

$x <$

Teaching

Today, we will apply our skills and knowledge to real-world applications.

Example: A waiter earned \$8.50 per hour plus an additional \$112 in tips at work on Saturday night. He wants to earn more than \$180 in all. What is the fewest number of hours he must work to earn this amount of money? # of hours = _____

$h = \# \text{ of hours he needs to work}$	Assign a variable, h , for the unknown.
$8.50h + 112 > 180$	Write an inequality.
$8.50h + 112 > 180$ $-112 \quad -112$	Use Subtraction Property of Inequality to subtract 112 from both sides.
$\frac{8.50h}{8.50} > \frac{68}{8.50}$	Use Division Property of Inequality to divide both sides by 8.50.
$h > 8$	He must work more than 8 hours.

Practice

1. A delivery person uses an elevator to bring boxes of books up to an office. The delivery person weighs 200 lbs. and each box of books weighs 50 lbs. The maximum capacity of the elevator is 1,000 lbs. What is the maximum number of boxes of books the delivery person can bring up at one time?
2. Skate Land charges a \$50 flat fee for a birthday party rental and \$5.50 per person. Eliza has no more than \$125 to spend on a birthday party. How many people can Eliza invite to her party?
3. Negative two times a number minus twelve is less than or equal to the same number added to twenty-seven. Write and solve an inequality that represents this situation.

Check & Reflect: Use page 16 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 5

Weekly Reflection: Today you will reflect on and summarize your learning over the week.

Prove me wrong! Look at the steps of the equation or inequality. There is a mistake in each problem. Find and fix the mistake, then explain a strategy that could be used to avoid making the same mistake in the future.

$2 - 3(4x + 2) = 5x$ $-1(4x + 2) = 5x$ $-4x - 2 = 5x$ $-2 = 9x$ $\frac{-2}{9} = x$ <p>Solve the problem correctly.</p>	$3x - 2 - 8x > 4 + 5x - 11$ $-5x - 2 > 5x - 7$ $-10x < -5$ $x < \frac{-5}{-10}$ $x < \frac{1}{2}$ <p>Solve the problem correctly.</p>
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Answer Guide

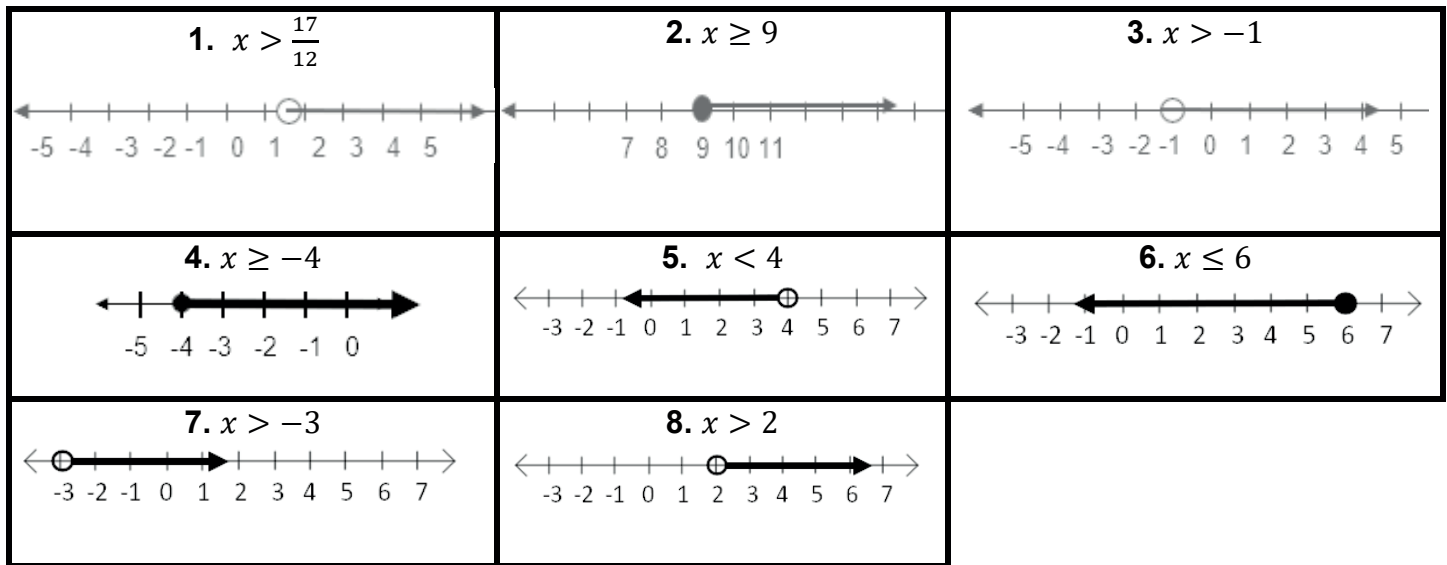
Day 1: Number Sense Routine $4^2 - (6 \cdot 2 + 1) = 3$

Practice: 1. $n = 2$ 2. $x = 9$ 3. $x = 7$ 4. $m = -4$ 5. $x = \frac{65}{2}$ 6. $y = 2$ 7. $n = \frac{1}{7}$

Day 2: Number Sense Routine $3(2x + 1) = 4$ is not equivalent to the other three. $6 - 3(2x + 1) = 4$ if you distribute -3 first, you will have $6 - 6 - 3 = 4$, and if you subtract 6 from both sides first, you will have $-3(2x + 1) = -2$ which are both appropriate ways to solve this equation.

Practice: 1. $1500x + 45 = 1320, x = \$0.85$ 2. $12.25 + 1.95x = 2.8x, x = 14.41$ gallons

Day 3: Number Sense Routine answers may vary. Both of these inequalities have numbers less than 1.5 as possible solutions. These are different because $5(2x - 1) \leq 10$ can equal 1.5.



Day 4: Number Sense Routine $-3x < -2$

1. $200 + 50x \leq 1000, x \leq 16$ boxes 2. $50 + 5.5x \leq 125, x \leq 13$ people
 3. $-2x - 12 \leq x + 27, x \geq -13$

Day 5:

$2 - 3(4x + 2) = 5x$ $-1(4x + 2) = 5x$ $-4x - 2 = 5x$ $-2 = 9x$ $\frac{-2}{9} = x$	<p>The first step should be to distribute -3 instead of 2-3 because multiplication (distributive property) comes before subtraction in the order of operations.</p> $\frac{-4}{17} = x$	$3x - 2 - 8x > 4 + 5x$ -11 $-5x - 2 > 5x - 7$ $-10x < -5$ $x < \frac{-5}{-10}$ $x < \frac{1}{2}$	<p>When you multiply or divide by a negative number, you have to flip the inequality symbol, $x > \frac{1}{2}$.</p>
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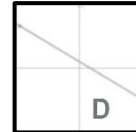
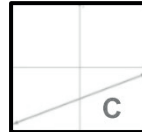
Linear Functions

Weekly Learning Outcome:

- I can determine if a relation is a function, find the domain and range, determine and identify the slope and y-intercept of a line, identify the independent and dependent variable, and graph a line in slope-intercept form.

Day 1

Number Sense Routine: Which graph doesn't belong? Try to find a reason each one doesn't belong.



I think _____ does not belong because _____.

Teaching




Today we will review vocabulary relating to functions and relations. <https://bit.ly/2U2OSFE>

Term	Definition	Example
Relation	Any set of ordered pairs	$\{(-4, 2), (0, 1), (9, 3), (-4, 8)\}$
Function	Any set of ordered pairs where each input is related to exactly one output (x-values do not repeat). Can be represented as a set of <u>ordered pairs</u> , <u>table of values</u> , <u>graph</u> , <u>equation</u> , <u>model</u> or <u>words</u> .	$\{(-2, 0), (4, 2), (3, 7), (-8, -8)\}$
Domain	First number in an ordered pair; input values for the independent variable	$\{(-2, 0), (4, 2), (3, 7), (-8, -8)\}$
Range	Second number in an ordered pair; output value for the independent variable	$\{(-2, 0), (4, 2), (3, 7), (-8, -8)\}$
Independent Variable	The quantity that is being changed; the x-value	The height of a plant depends on the amount of water the plant receives. The amount of water the plant receives is the independent variable
Dependent Variable	The quantity that <i>depends</i> on how the independent variable is changed; the y-value	The height of a plant depends on the amount of water the plant receives. The height of the plant is the dependent variable .
Vertical Line Test	For any value of x, a vertical (\updownarrow) line passes through no more than one point on the graph for it to be a function. No two points have the same x-value.	

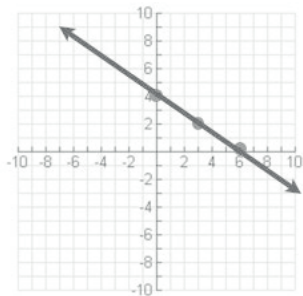
Teaching

Today we will review how to recognize the **types of slope** and identify the **slope and y-intercept of a function**. Recall that **slope** represents the **rate of change** in a linear function or the “**steepness**” of the line. In the form $y = mx + b$, m is the slope (how we will **move**) and b is the y-intercept (where the line intersects the y-axis).

Types of Slope

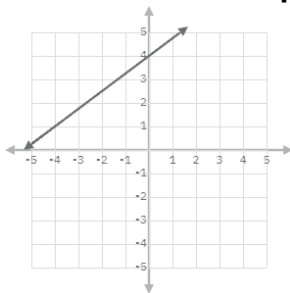
Positive	Negative	Zero
		
The line slants up to the right	The line slants down to the right	The line is horizontal

Optional Video about Slope and y-intercept: <https://bit.ly/3dkE1hL>

Example 1: Given the equation of the linear function $y = -3x + 2$, identify the slope and the y-intercept.	Example 2: Given the table of values, determine the slope and y-intercept of the linear function.	Example 3: Identify the slope and y-intercept of the given function.												
<p>This is written in the form $y = mx + b$</p> <p>The slope (m) is -3 and the y-intercept (b) is 2.</p>	<p>In the table, the point $(0, 2)$ represents the y-intercept. The slope is determined by observing the change in each y-value compared to the corresponding change in the x-value.</p> <table border="1" data-bbox="673 1102 917 1375"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr> <td>-2</td> <td>8</td> </tr> <tr> <td>-1</td> <td>5</td> </tr> <tr> <td>0</td> <td>2</td> </tr> <tr> <td>1</td> <td>-1</td> </tr> <tr> <td>2</td> <td>-4</td> </tr> </tbody> </table> <p style="text-align: center;"> $\text{slope } (m) = \frac{\text{change in } y\text{-value}}{\text{change in } x\text{-value}} = \frac{-3}{1} = -3$ </p>	x	y	-2	8	-1	5	0	2	1	-1	2	-4	 <p>Begin at the y-intercept $(0, 4)$. From that point, count the rise (or fall) and the run until you reach the next point, $\frac{-2}{3}$.</p>
x	y													
-2	8													
-1	5													
0	2													
1	-1													
2	-4													

Practice: Determine the slope and y-intercept.

1.



Slope: _____
y-intercept: _____

2.

x	y
-2	14
-1	10
0	6
1	2
2	-2

Slope: _____
y-intercept: _____

3. $y = 4x + 11$

Slope: _____
y-intercept: _____

Check & Reflect: Use page 23 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 3

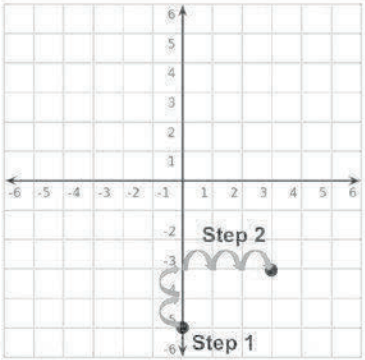
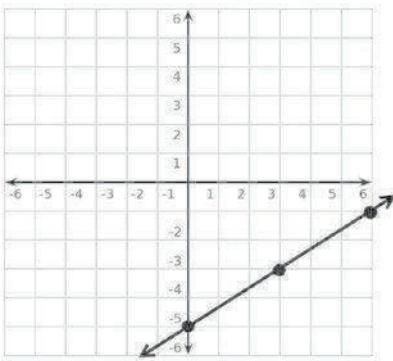
Number Sense Routine: How do you know that the table of values and the equation to the right represent the same function?

X	Y
-3	10
0	4
1	2
5	-6

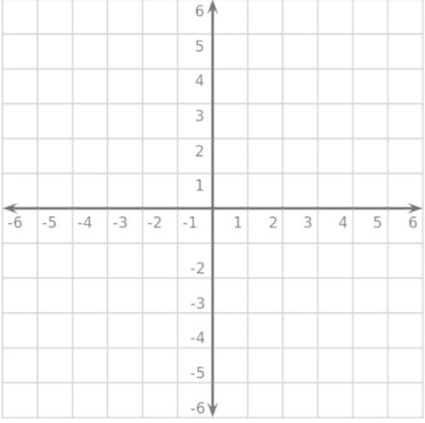
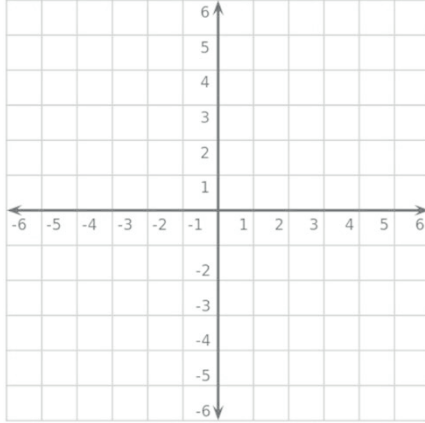
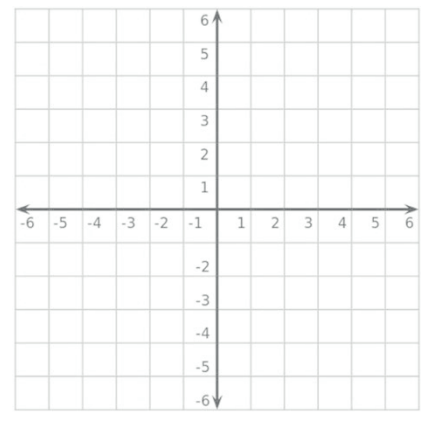
$$y = -2x + 4$$

Teaching: Graphing Linear Equations Optional Video at <https://bit.ly/301VW9h>

Today we will graph a line from slope intercept form. $y = mx + b$ is an equation of a line in where m is the slope and b is the y-intercept. Let's look at how to graph $y = \frac{2}{3}x - 5$.

	<p>1. Identify the y-intercept and plot this point on the y-axis</p> $y = \frac{2}{3}x - 5$
	<p>2. Identify the slope.</p> $y = \frac{2}{3}x - 5$ <p>3. Starting at the y-intercept, use the slope to count "rise over run" to plot your next point. The rise is 2 over the run, which is 3.</p> <p>4. Use the slope one more time to find a third point, then connect all 3 points with a straight edge.</p> <p>The graph to the left represents the line $y = \frac{2}{3}x - 5$.</p>

Application and Practice: Graph the following lines.

<p>1. $y = 3x + 2$</p> 	<p>2. $y = -\frac{3}{4}x - 1$</p> 	<p>3. $y = x - 3$</p> 
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Check & Reflect: Use page 23 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 4**Number Sense Routine**

- Complete the relation so it is **not a function**: $\{(3, 5), (-2, 5), (\underline{\quad}, -2), (-6, 6)\}$
- Complete the relation so it is **a function**: $\{(5, 1), (0, 9), (\underline{\quad}, 5)\}$

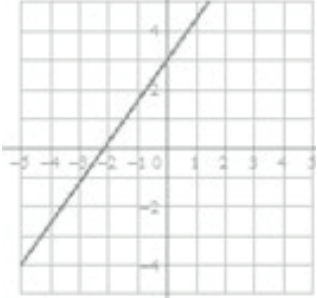
Connections and Review

- Which does not belong?

	$y = \frac{1}{4}x + 4$ <p>The quotient of one fourth the input increased by 4 equals the output</p>	<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">x</td> <td style="padding: 5px;">-4</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">4</td> <td style="padding: 5px;">8</td> </tr> <tr> <td style="padding: 5px;">y</td> <td style="padding: 5px;">3</td> <td style="padding: 5px;">4</td> <td style="padding: 5px;">5</td> <td style="padding: 5px;">6</td> </tr> </table>	x	-4	0	4	8	y	3	4	5	6
x	-4	0	4	8								
y	3	4	5	6								

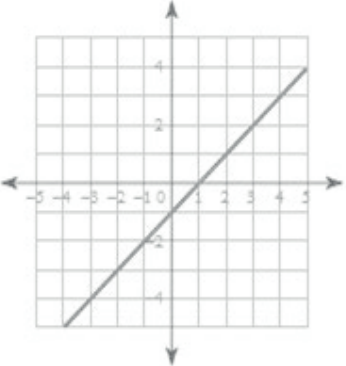
The _____ does not belong because _____

2. Which does not belong?

	$y = 5x + 3$	<table border="1" style="margin: auto;"> <tr><td>x</td><td>y</td></tr> <tr><td>-1</td><td>-2</td></tr> <tr><td>0</td><td>3</td></tr> <tr><td>1</td><td>8</td></tr> <tr><td>2</td><td>13</td></tr> </table>	x	y	-1	-2	0	3	1	8	2	13
x	y											
-1	-2											
0	3											
1	8											
2	13											
	Kevin started by running 3 miles and runs 5 additional miles each week											

The _____ does not belong because _____

3. Which does not belong?

	$y = -x - 1$	<table border="1" style="margin: auto;"> <tr><td>x</td><td>-4</td><td>-3</td><td>-2</td><td>-1</td></tr> <tr><td>y</td><td>-5</td><td>-4</td><td>-3</td><td>-2</td></tr> </table>	x	-4	-3	-2	-1	y	-5	-4	-3	-2
x	-4	-3	-2	-1								
y	-5	-4	-3	-2								
	The output decreased by one is the same as the input											

The _____ does not belong because _____

Check & Reflect: Use page 23 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 5: Weekly Reflection

1. Describe the difference between a positive, negative, and zero slope.

2. Describe a mistake you made during this week's activities and what you learned from it.

Answer Guide

Day 1 NSR: Answers may vary. Make sure your answer has mathematical vocabulary such as slope, y-intercept, function, increasing, decreasing.

1. D: $\{-4, 9\}$, R: $\{1, 2, 8\}$, No, the x-value of -4 repeats 2. IV: # of hours, DV: total cost 3. No, fails the vertical line test (the x-values repeat)

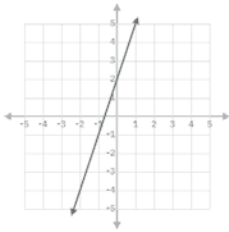
Day 2 NSR: Answers may vary. One suggestion is they are alike because they both represent part of a whole; they are different because $\frac{1}{3}$ and $\frac{3}{10}$ have different values.

1. $m = \frac{3}{4}, b = 4$ 2. $m = -4, b = 6$ 3. $m = 4, b = 11$

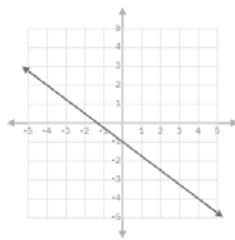
Day 3

NSR: Answers may vary. One suggestion, when I plug in each x value from the table and solve the equation, my answer is its matching y-value

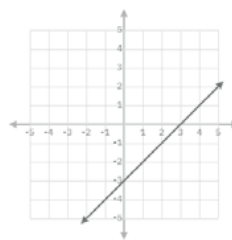
1.



2.



3.



Day 4 NSR: 1. 3, -2 or -6 would result in a relation that is not a function. 2. Anything other than 5 or 0 will result in a function

- The sentence does not belong. It should be "the product of one fourth and x" not the quotient.
- The graph does not belong because the slope is $\frac{7}{5}$, not 5, like it is in the equation.
- The equation does not match; it should be $y = x - 1$

Day 5

- Answers may vary. Positive slopes go up from left to right like you are climbing up a hill. Negative slopes go down from left to right like you are sliding down a slide. Zero slopes are flat like you are walking along a flat sidewalk, and that takes zero effort.
- Answers may vary. Look back at the toughest topic and decide how you will remember how to do problems like these in the future.

Pythagorean Theorem

Weekly Learning Outcome:

- I can verify the Pythagorean Theorem and solve practical problems using the Pythagorean Theorem.

Day 1

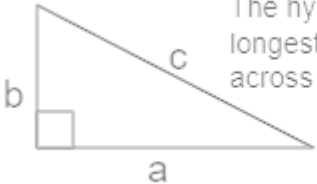
Number Sense Routine

$3^2 = 9$ and $\sqrt{9} = 3$. How are these two equations alike? How are they different?

The equations are alike because _____

The equations are different because _____

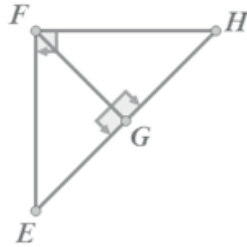
Teaching: Introduction to the Pythagorean Theorem Video at <https://bit.ly/2XyL0yI>

 <p>The hypotenuse (c) is the longest side of a right triangle across from the right angle.</p>	Pythagorean Theorem $a^2 + b^2 = c^2$	
Example Problem	Triangle 1	Triangle 2
Problem: Verify the triangle is a right triangle	Side 1: 6 Side 2: 8 Side 3: 10	Side 1: 4 Side 2: 5 Side 3: 6
Step 1: Identify the longest side. This is your hypotenuse; label it <i>c</i> . Select which side is <i>a</i> and <i>b</i> .	$a=6$ $b=8$ $c=10$	$a=4$ $b=5$ $c=6$
Step 2: Plug the values into the Pythagorean Theorem	$a^2 + b^2 = c^2$ $6^2 + 8^2 = 10^2$	$a^2 + b^2 = c^2$ $4^2 + 5^2 = 6^2$
Step 3: Square each number	$36 + 64 = 100$	$16 + 25 = 36$
Step 4: Simplify. If both sides are equal, then these are sides of a right triangle. If they are not equal, then it is not a right triangle	$100 = 100$ This is a right triangle.	$41 \neq 36$ This is not a right triangle.

Application

1. Circle each side that is a hypotenuse.

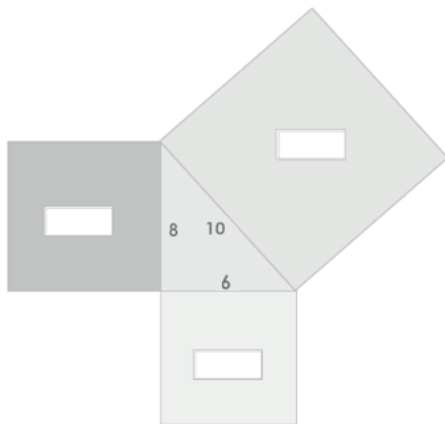
\overline{FH}	\overline{FE}
\overline{EG}	\overline{GH}
\overline{EH}	\overline{FG}



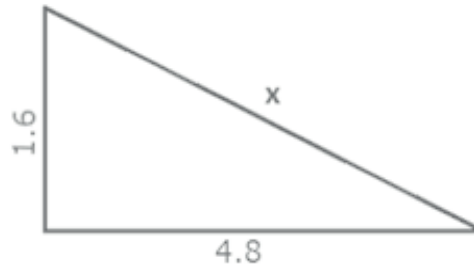
2. Which of the following **could not** represent three sides of a right triangle?

- a. $a = 9, b = 12, c = 15$
- b. $a = 5, b = 12, c = 13$
- c. $a = 6, b = 8, c = 12$
- d. $a = 7, b = 24, c = 25$

3. Write numbers in each empty box in each square to justify the Pythagorean Theorem.



4. Use the information at the bottom to fill in the table below the right triangle with the correct justification of the Pythagorean Theorem.



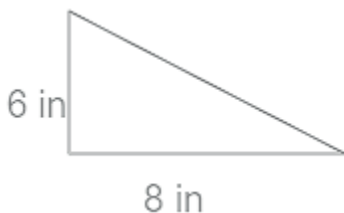
<input type="text"/>	+	<input type="text"/>	=	<input type="text"/>
x		x^2		4.8
		4.8^2		1.6
				1.6^2

Check & Reflect: Use page 30 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 2

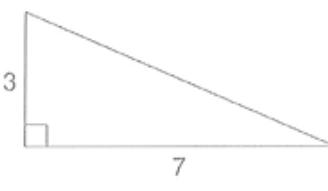
Number Sense Routine: Is the triangle below a right triangle? How do you know?

The triangle below _____ a right triangle because _____



Teaching

Example: Find the length of the missing hypotenuse for the given right triangle.

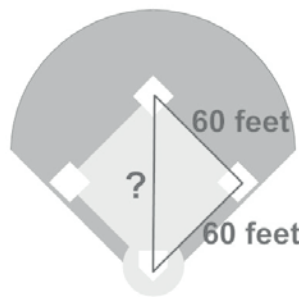
	$a^2 + b^2 = c^2$ $a = 3, b = 7, c = ?$	Step 1: Write the Pythagorean Theorem and identify your missing side.
	$3^2 + 7^2 = c^2$	Step 2: Substitute your known sides.
	$9 + 49 = c^2$	Step 3: Square each number to simplify.
	$58 = c^2$	Step 4: Add.
	$\sqrt{58} = \sqrt{c^2} \quad 7.62 = c$	Step 5: Take the square root of each side to find c.

Application and Practice

1. Find the missing side.

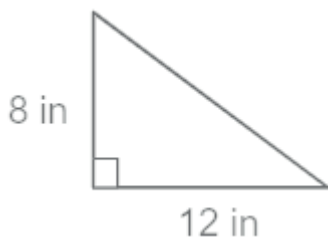


2. The bases on a baseball diamond are 60 feet apart. What is the straight-line distance from second base to home plate?



3. Sally locked her keys in her house. The only open window is 12 feet off the ground. There is a 4-foot-wide garden next to the base of the house. How long of a ladder does Sally need to reach the open window but avoid the garden?

4. Find the missing side.

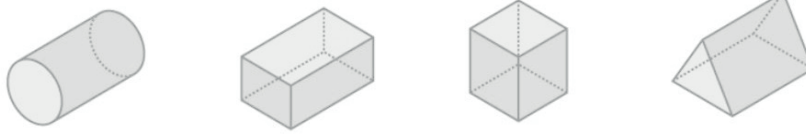


5. What is the length of the diagonal of a TV that measures 2.25 feet high and 4 feet wide?

6 Find the length of the missing side.



Check & Reflect: Use page 30 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

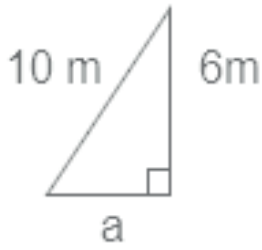
Day 3**Number Sense Routine: Which One Doesn't Belong?**

The _____ does not belong because _____

Pythagorean Theorem

Today we will review how to use the **Pythagorean Theorem** to find the length of a leg of a right triangle. The process is the same as Day 2, except this time the **length of leg a or b is missing**.

Example: Find the length of the missing side for the given right triangle.



$$a^2 + b^2 = c^2$$

$$a^2 + 6^2 = 10^2$$

$$a^2 + 36 = 100$$

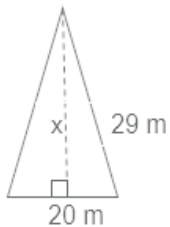
$$\begin{array}{r} -36 \\ -36 \end{array}$$

$$\sqrt{a^2} = \sqrt{64}$$

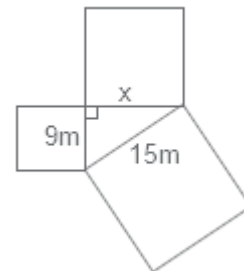
$$a = 8m$$

Practice: Find the measure of the missing side. Round to the nearest hundredth, if necessary.

1.

2. $a = 9cm, b = ?, c = 41cm$

3.



4. Jessie walked 3 miles south from his school and then walked 4 miles east. How far is Jessie from his school? (Draw a picture!)

5. A lighthouse that is 125 feet tall casts a 140-foot shadow on the surface of the water. What is the distance from the top of the lighthouse to the top of its shadow? (Draw a picture!)

6. A 32-foot ladder is leaning against a house. The top of the ladder reaches a window that is 18 feet above the ground. About how far is the base of the ladder from the house? (Draw a picture!)

Check & Reflect: Use page 30 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 4

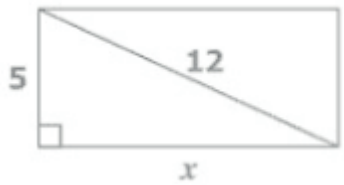
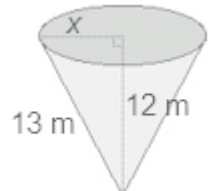
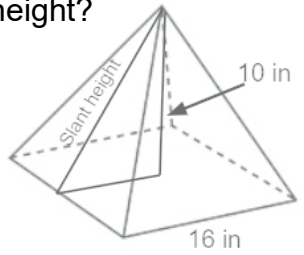
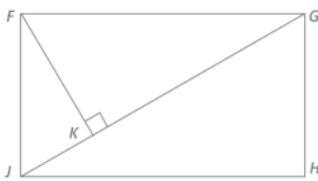
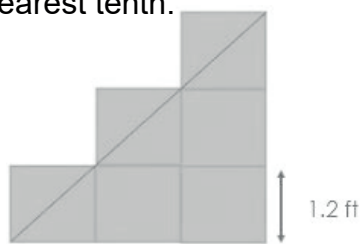
Number Sense Routine: Would you rather....

Option A: Buy 3 video games and get 1 half off?

Option B: Take 20% off the total?

I would chose to _____ because _____

Application: Use the Pythagorean Theorem to answer the following. If necessary, round your final answer to the nearest hundredth.

<p>1. </p> <p>Using the figure above, find x.</p>	<p>2. </p> <p>Using the figure above, find the length of the missing leg.</p>	<p>3. The pyramid has a height of 10 in and a square base with side lengths of 16 in. What is the slant height?</p> 
<p>4. Which statement is true about the right triangles with the following side lengths?</p> <ol style="list-style-type: none"> 1. $a = 5$ $b = 6$ $c = 9$ 2. $a = 10$ $b = 12$ $c = 30$ <ol style="list-style-type: none"> a. Both 1 and 2 are right triangles b. Neither 1 nor 2 are right triangles c. Only 1 is a right triangle d. Only 2 is a right triangle 	<p>5. Using the figure below, identify all possible hypotenuses. (Remember these are sides of a triangle, use \overline{AB})</p> 	<p>6. The figure below consists of 6 identical squares with side lengths of 1.2 ft. What is the length of the diagonal? Round to the nearest tenth.</p> 

Check & Reflect: Use page 30 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 5: Weekly Reflection

Your friend was out of town for class this week. What are the top 3 things you would tell your friend so they will be successful when solving problems using the Pythagorean Theorem?

Answer Guide

Day 1: NSR: Answers will vary: Alike: Both have 3 & 9, 9 is a perfect square because $3 \cdot 3 = 9$ and $\sqrt{9} = 3$ Different: One has a square root symbol and the other doesn't; one has an exponent and the other doesn't. **Practice:** 1. $\overline{FE}, \overline{FH}, \overline{EH}$ 2. C 3. $6^2, 8^2,$ and 10^2 should be placed in the boxes with the corresponding side length. 4. $4.8^2 + 1.6^2 = x^2$

Day 2: NSR: You know a triangle is a right triangle when $a^2 + b^2 = c^2$. We cannot tell if this is a right triangle because we do not know the measure of the longest side. It could be a right triangle because it looks like one, but we cannot be certain. **Practice:** 1. 26.08 ft 2. 84.85 ft 3. 12.65 ft
4. 14.42 in 5. 4.59 ft 6. 13.04 in

Day 3: NSR: Answers will vary. For example, the cylinder does not belong because it has circular bases. **Practice:** 1. $x=27.22\text{m}$ 2. $b=40\text{cm}$ 3. $x=12\text{m}$ 4. Jessie is 5 miles from school
5. The distance is 187.68ft 6. The distance is about 26.46ft

Day 4: NSR: Answers will vary. Depends on the price of the games. Do you need 4 games? What is the total? 1. $x=10.91$ 2. $x=5\text{m}$ 3. $x=12.81$ 4. B 5. $\overline{GJ}, \overline{FG}, \overline{FJ}$ 6. 5.09ft

Day 5: Answers will vary. Formula: $a^2 + b^2 = c^2$. Hypotenuse (c) is always across from the right angle and is the longest side. If it is a word problem, draw a picture.

Scatterplots

Weekly Learning Outcome:

- I can represent data in scatterplots, make observations about data represented in scatterplots, and use a drawing to estimate the line of best fit for data represented in a scatterplot.

Day 1

Number Sense Routine: Which one doesn't belong? a) 33% b) $\frac{1}{3}$ c) $\frac{5}{3}$ d) $0.\bar{6}$

I think _____ doesn't belong because _____

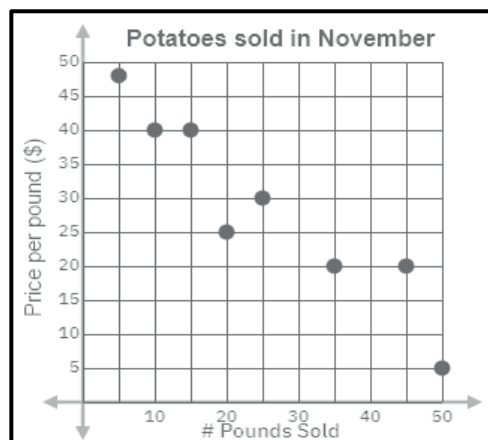
Teaching: Constructing a Scatterplot Video: <https://bit.ly/2Y7qrYL>

A **scatterplot** illustrates the relationship between two sets of numerical data represented by two variables (bivariate data). A scatterplot consists of points on the coordinate plane. In a scatterplot, each point may represent an independent and dependent variable. A scatterplot can suggest various kinds of linear relationships between variables. Quantitative data must be used to create a scatterplot. Today we will investigate how to create a scatterplot with a given set of data.

Example:

Potatoes Sold in November

# pounds sold	50	35	20	15	45	10	5	25
Price per pound (\$)	5	20	25	40	20	40	48	30

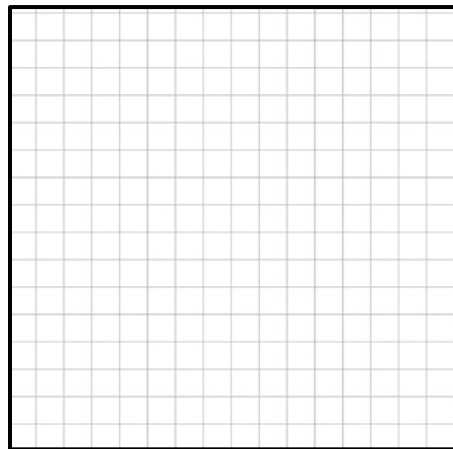


Application

Create a scatterplot with the following information. Make sure you label your axes and title your graph

Mrs. Smith's 1st Period PE Students' Weight & Height

Weight (lb)	100	109	105	107	105	102	110
Height (in)	61	64	66	65	65	62	63



- 1) How many students took Mrs. Smith’s survey in her 1st period PE class?
- 2) Why might it be helpful to use or create a scatterplot instead of using only a table?

Check & Reflect: Use page 36 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 2

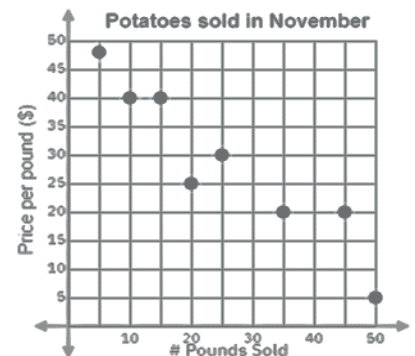
Number Sense Routine: How many different ways can you make this number using absolute value? Get creative!

Number of the Day

−9

Teaching Scatterplots (direction) video: <https://bit.ly/2My0q85>

Last lesson, we began to explore scatterplots. Let’s look at a scatterplot of the amount of potatoes sold. We will examine the scatterplot to make sense of the information displayed and answer some sample questions.



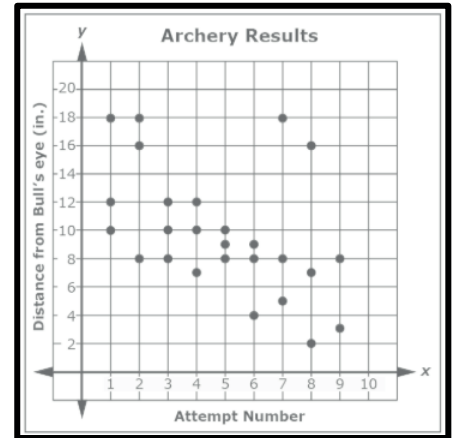
Problem	Example Thinking
<p>A local restaurant needed to buy 50 pounds of potatoes for their Thanksgiving dinner menu. How much did they pay per pound?</p>	<p>Let’s find which point represents the restaurant. Since there are 50 pounds, we will find 50 on the x-axis. We see a point at (50, 5), showing 50 pounds sold and \$5 per pound. (See scatterplot above.) This must be the restaurant since there are no other data points with 50 pounds in the scatterplot! The restaurant paid \$5 per pound.</p>

<p>How often was more than \$30 per pound of potatoes purchased? What percentage of total purchases was this?</p>	<p>Let's look at each point. We want to find points where the y-value (price per pound) is greater than \$30. There are 3 data points where the price per pound was above \$30. We know that there are 8 data points, so 3 out of 8 is $\frac{3}{8}$, or 37.5%.</p>
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Application

Mr. Vasquez's archery team just returned from a competition in Kansas. The team data is shown in the scatterplot to the right. Each data point represents one archer.

- 1) How many archers are on Mr. Vasquez's team?
- 2) How many archers had exactly 7 attempts?
- 3) What percentage of the archers were more than 11 inches from the bullseye?



Check & Reflect: Use page 36 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 3

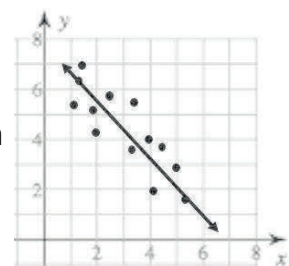
Number Sense Routine: Which does not belong? a) 3.14 b) $3.\overline{14}$ c) π d) $\frac{22}{7}$

_____ does not belong because _____

Teaching: Line of Best Fit – Estimating the line of best fit video: <https://bit.ly/2Mz2TXp>

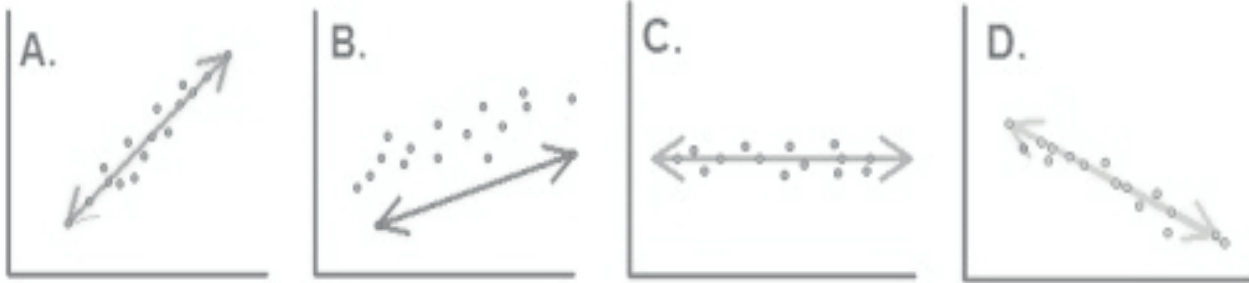
A **line of best fit** will fit the general trend of all of the data in the scatterplot. It will have roughly the same number of points above and below the line.

It will be a straight line you can draw with a ruler. The graph on the right represents a line of best fit because the scatterplot has a negative correlation and the slope of the line is negative. It goes down at roughly the same rate as all of the points. The line has roughly the same number of points above and below the line.

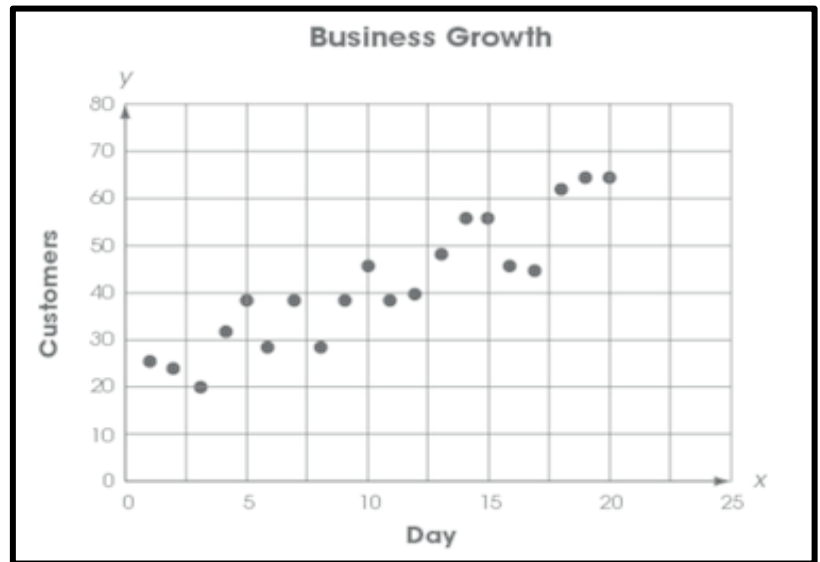


Application and Practice

1. Which is not a good example of a line of best fit?



2. Ms. Musto opened a new coffee shop. She recorded the number of customers she served between opening and noon for the first 20 days of business. Her results are shown on the graph. Estimate a line of best fit.



3. Using your line of best fit from problem 2, how many customers would you expect Ms. Musto to have on day 25?

Check & Reflect: Use page 36 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 4

Number Sense Routine: Alike and different. How are positive and negative correlations similar? How are they different?

Positive and negative correlations are similar because _____

Positive and negative correlations are different because _____

Review

In 1926, the wolf population in Yellowstone National Park was eliminated. In 1995, scientists reintroduced wolves into the park. The chart below shows the total wolf population from 1995 to 2007.

Years since 1995	Number of wolves
0	21
1	51
2	86
3	112
4	118
5	119
6	132
7	148
8	174
9	171

1. Create a scatter plot for the wolf population of Yellowstone. Make sure to label your axis
2. Draw a line of best fit
3. What is the independent variable? _____
4. What is the dependent variable? _____
5. What tends to happen to the wolf population as the year increases?
6. If this trend continues, how many wolves would you expect there to be in Yellowstone National Park 15 years after 1995? _____

Check & Reflect: Use page 36 to check your answers. What did you get correct? Can you work it a different way? What was incorrect? Can you find your mistake? What can you do differently?

Day 5: Weekly Reflection

Scatter plots are often used to show relationships such as comparing a person’s weight to their height. As a person’s height increases you would expect their weight to increase as well, showing a positive correlation. Give three more examples of something that could be compared using a scatter plot and tell what you expect the correlation to be.

Example 1: _____ . I would expect the correlation to be _____ .

Example 2: _____ . I would expect the correlation to be _____ .

Example 3: _____ . I would expect the correlation to be _____ .

Answer Key

Day 1 NSR: Answers may vary. Sample response: 33% is the only terminating decimal

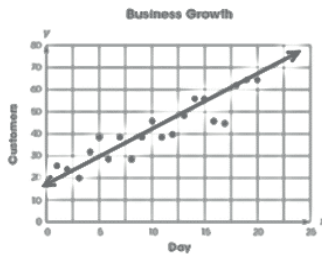
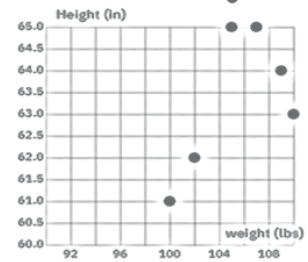
1. 7 students. 2. With a scatterplot, you can see the trend of the data. 3.

Day 2 NSR: Answers may vary. Sample response: |10 – 19|

1. 26 archers 2. 3 archers 3.31%

Day 3 NSR: Answers may vary. 22/7 is the only fraction.

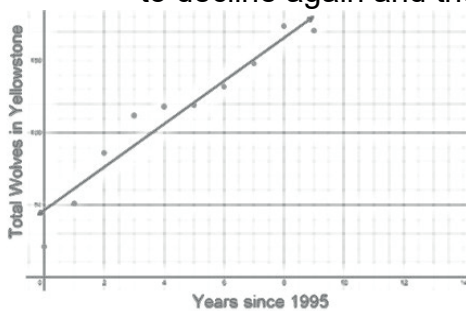
Pi is the only irrational number.



1. B 2. 3. Around 80 customers

Day 4 NSR: Answers may vary. Sample answer: similar because they are both used to represent trends in the data. They are different because positive correlations have both variables increasing, negative correlations have the x increase and the y decrease.

- 1&2. See graph below. 3. Years since 1995 4. Number of Wolves in Yellowstone 5. As the number of years increase, the wolf population increases. 6. Between 200 and 300 wolves in 2010 (Interestingly, this did not turn out to be true. In 2007 the population started to decline again and there were only 97 wolves in 2010)



Day 5: Answers may vary. An example could be movie ticket purchases since 2017. The correlation would be negative because of people streaming movies online instead of going to the theater.

Some resources used or adapted from:

AlgebraHouse.com: [Line of Best Fit](#)

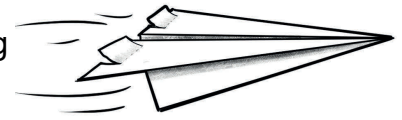
Open Middle® problems are licensed under a Creative Commons Attribution-NonCommercial- ShareAlike 4.0 International License. [1.1](#), [1.2](#), [2.4](#)



SUMMER LEARNING QUEST: Paper Airplane Challenge



For centuries, scientists and engineers watched birds fly and hoped to mimic flight. First attempts to design “flying machines” looked very much like birds; current airplanes still have some similarities.

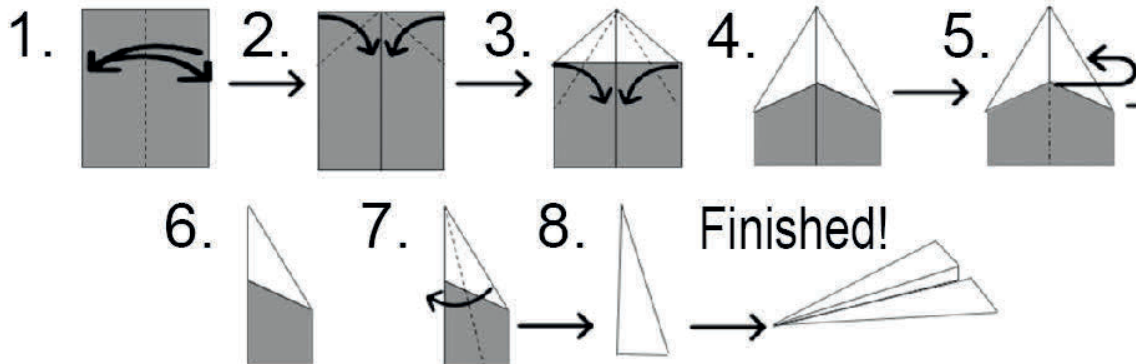


How can you design a paper airplane based on a bird’s design that will fly the furthest distance?

Task Guidelines:

- Use one piece of paper per design.
- Experiment with paper airplane designs. Try at least two designs.
- Consider using the steps below for your first design, then experiment on your second idea.

DESIGN: If you need a sample, follow the steps to make a simple paper airplane. Take your time and make nice folds like you are in art class! If you already have experience, design your own from the start



Plan: Make a detailed drawing of your airplane or designs. Consider the steps and folds you made to create your best airplane design. Use the space below.

Go to the next page to test and revise your airplane design!

Test: Find a place to test your airplane. A sidewalk with adult permission works great.

- Measure the distance in steps or count sidewalk blocks.
- Adjust how hard or soft you throw the plane.
- Try your test several more times. Did you get the same results? Which design worked best?

How Far does it go?

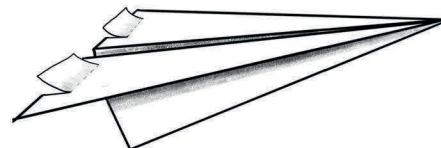
Test 1	Test 2	Test 3
On the first try, it went :	One the second try, it went:	On the third try, it went:

Improve: Use this chart to think about your ideas

What worked well?	What didn't work?

My ideas to make my design better

- When you change your design, how many more blocks or inches do you think it will fly or sail?
- Did your plane fly straight down the sidewalk?
- What changes can you make for it to fly more straight?



Share your work

- Family Friend Someone else

Ask about designs they may know or think of.

What makes them think of that idea?

Think about your work:

What did you like best?

What could you make better?

What is unique about your design?

Questions and ideas to take this project further:

- Learn more about flight at: <https://howthingsfly.si.edu/> and examples from nature: <https://www.audubon.org/news/these-paper-airplanes-fly-birds>
- What was the average distance of each plane design? Graph your data.
- Observe birds and airplanes in flight. Make notes about the differences in how they fly.
- Design and test more complex designs! See additional ideas at: <https://howthingsfly.si.edu/activities/paper-airplane>.



SUMMER LEARNING QUEST: CARTOONING WITH SIMPLE SHAPES



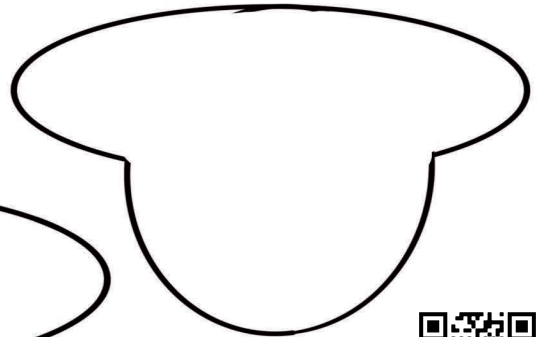
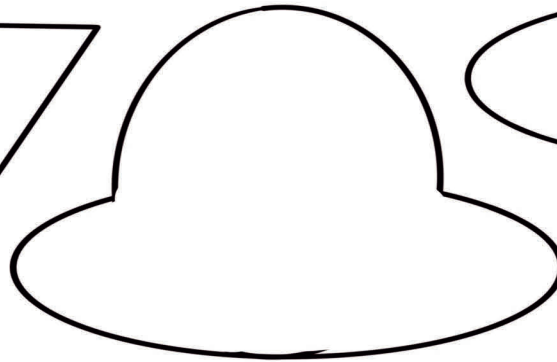
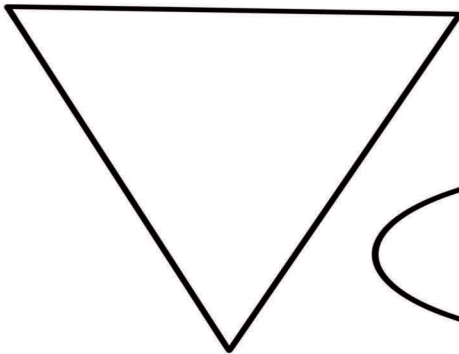
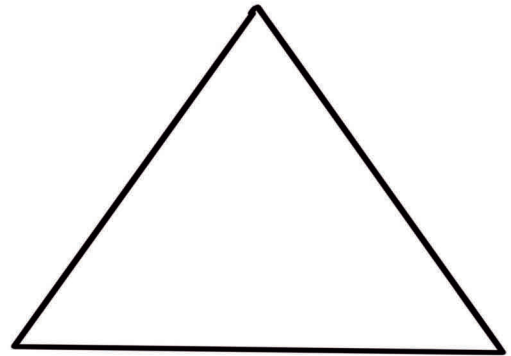
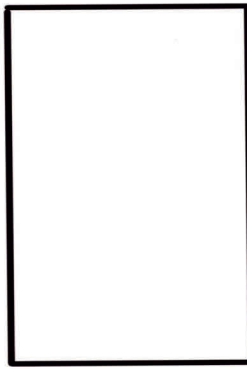
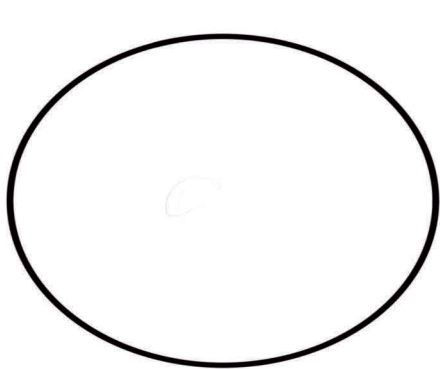
Today: you're a critical and creative thinker who can create unique ideas

Take a look around! What shapes do you see?
Most things are made up of simple shapes— from tables,
to televisions, and even our iPhones and iPads.
Today we're going to use the simple shapes to build
creativity and have fun!



How can you, as a cartoonist, create unique characters from simple shapes?


Your task: Use the shapes below to create characters. Be creative and draw light!

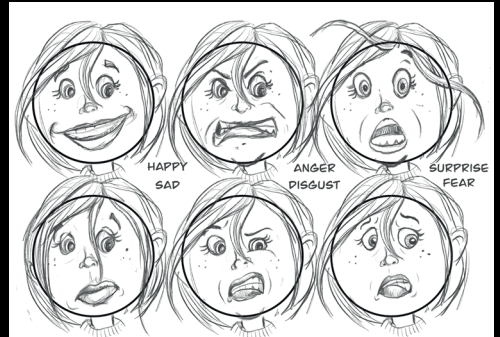


To go even deeper into cartooning with shapes, visit: <https://bit.ly/shapcartooning>

Reflect: Which of your designs is best? Why? What could you do to make it even better?

Ideas to take it further:

- Give your favorite design a name
- Now that you know your design is made from a basic shape, consider making the same character again. This time, add emotion by changing the eyebrows, eyes and mouth! 
- Remember— you can do this anytime! Just draw shapes and start creating!





SUMMER LEARNING QUEST: WHAT SHOULD YOU KNOW ABOUT COVID-19?

What can I do to prevent spreading COVID-19?



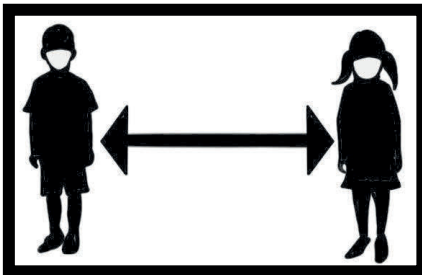
WASH YOUR HANDS:

Wash your hands with warm water and soap for 20 seconds (sing Happy Birthday twice), especially:

- After being in public places and touching door handles, shopping carts, elevator buttons, etc.
- After using the bathroom
- Before preparing food

If soap and water are not available, use hand sanitizer with at least 60% alcohol.

SOCIAL DISTANCE:



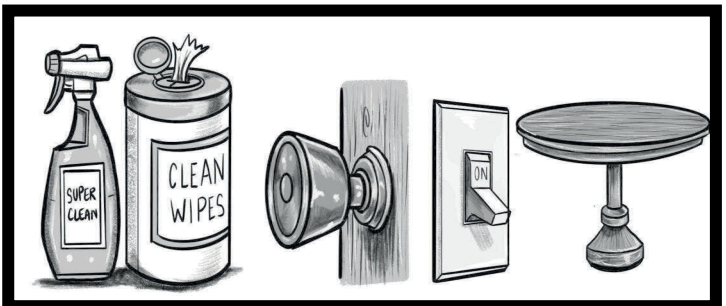
- Stay at least six feet away from others in public places.
- Stay home as much as possible and reduce visitors.
- Call friends and family or visit by video.



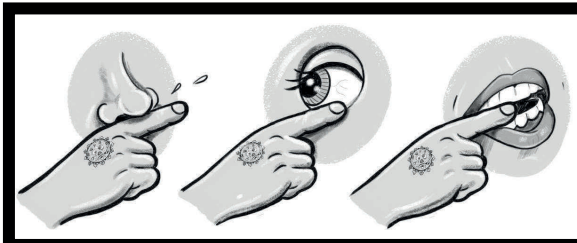
DO YOUR PART TO NOT SPREAD GERMS:



Clean and disinfect all counters, knobs, and other surfaces you and your family touch several times a day.



If you cough or sneeze, do so in the bend of your elbow. If you use a tissue, throw it away immediately.



Avoid touching your eyes, nose, or mouth, especially with unwashed hands.

Look at the back cover of the English Language Arts Practice Book to learn more about COVID-19!

Information Sources: [Centers for Disease Control and Prevention](#), [Mayo Clinic](#), [Nemours Children's Hospital](#)