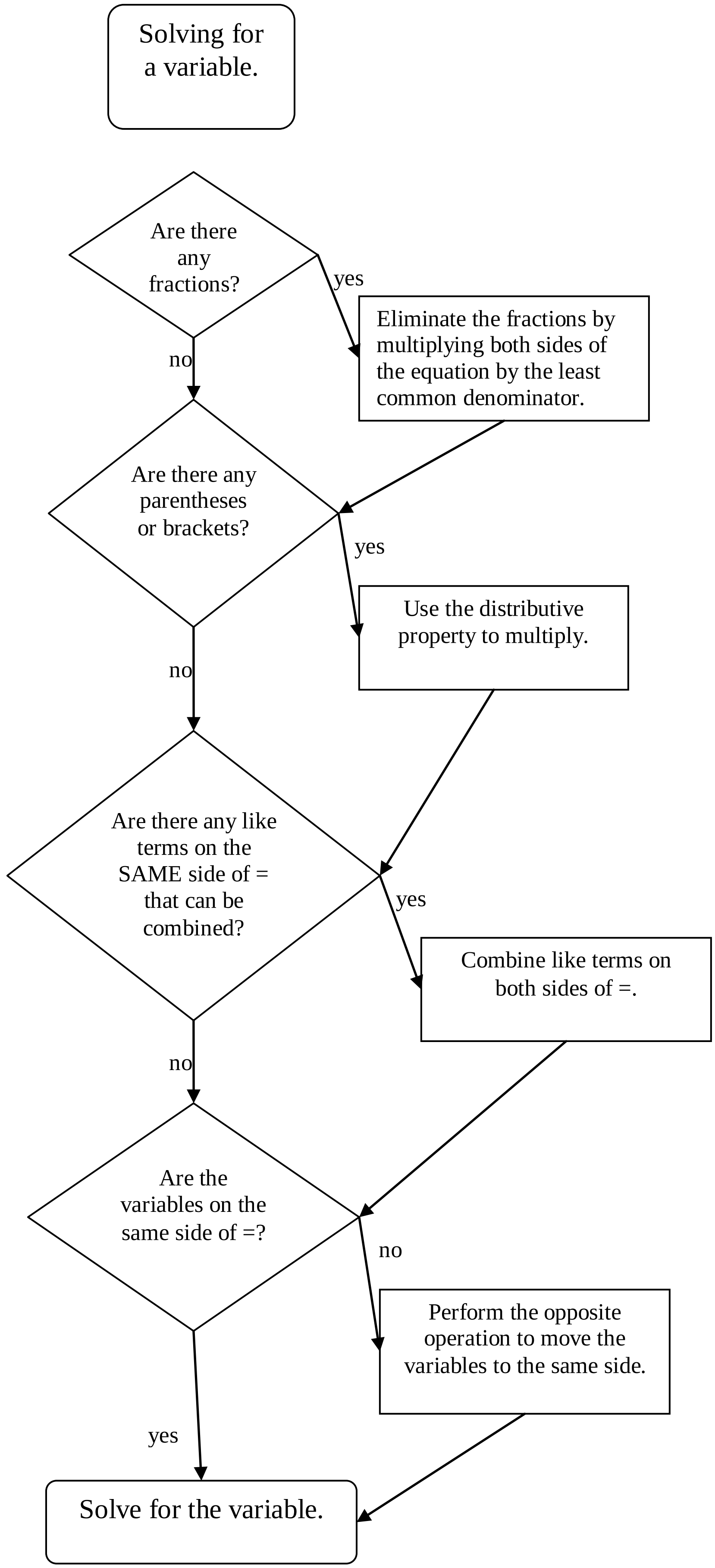
Unit 2, Activity 2, Split-Page Notetaking Example

$2(m + 3) + 5 = 7(4 - m) - 5m$	Simplify both sides of the equation using order of operations.
$2m + 6 + 5 = 28 - 7m - 5m$	Cannot simplify inside parentheses, so multiply using the distributive property. Combine like terms.
$2m + 11 = 28 - 12m$ $+12m \qquad +12m$	Bring the variables to the same side of the equation – use the opposite operation (Add 12*m* or subtract 2*m*).
$14m + 11 = 28$ $-11 \quad -11$	Isolate the variable. Subtract 11 from both sides
$\frac{14m}{14} = \frac{17}{14}$	Divide both sides by 14.
$m = \frac{17}{14}$	Solution

Unit 2, Activity 3, Equation Graphic Organizer



Unit 2, Activity 4, Vocabulary Self-Awareness Chart

Word	+	☑	-	**Example**	**Definition**
Solution to an equation					
Variable					
Coefficient					
Constant term					
Addition Property of Equality					
Subtraction Property of Equality					
Multiplication Property of Equality					
Division Property of Equality					
Distributive Property					
Commutative Property					
Associative Property					
Equation					
Inequality					
Formula					

Procedure:

1. Examine the list of words you have written in the first column.
2. Put a + next to each word you know well and for which you can write an accurate example and definition. Your definition and example must relate to the unit of study.
3. Place a ☑ next to any words for which you can write either a definition or an example, but not both.
4. Put a – next to words that are new to you.

This chart will be used throughout the unit. By the end of the unit you should have the entire chart completed. Because you will be revising this chart, write in pencil.

Proving Solution Methods

1. **Directions: Justify the statements in the solutions below. Use any of the properties that you have studied.**

Statements	**Reasons**
2(x + 1) + 1 = x - 5 - 2	**Original Problem**
2x + 2 +1 = x - 7	
2x + 3 = x - 7	
x + 3 = -7	
x = -10	

2. **Directions: Solve the equation and justify each step in the solution.**

Statements	**Reasons**
3(x + 2) + 4x = 4(x + 2) + 4	**Original Problem**

3. **Directions: Solve the equation and justify the solution. There is no value of x which will solve this equation.**

Statements	**Reasons**
2(x + 1) + 1 = (x - 5) + (x - 2)	**Original Problem**

4. **Directions: Solve the equation and justify each step of the solution. This equation is true for all values of the variable. It is called an identity.**

Statements	**Reasons**
3(x - 1) - 2 = 4(x - 4) -(x - 11)	**Original Equation**

5. **Explain how you would transform the equation 7x - 3y = 12 into each of the following equations as you isolate the variable *x*. Each part (a, b, or c) represents another step in the process to isolate the variable *x*.**

   a. $0 = 12 - 7x + 3y$ b. $7x = 3y + 12$ c. $x = \frac{3}{7}y + \frac{12}{7}$

6. **Explain how you would transform the equation 3x - 2y = 8 into each of the following equations as you isolate the variable *y*. Each part (a, b, or c) represents another step in the process to isolate the variable *y*.**

   a. $3x = 2y + 8$ b. $3x - 8 = 2y$ c. $\frac{3}{2}x - 4 = y$

Proving Solution Methods

1. **Directions: Justify the statements in the solutions below. Use any of the properties that you have studied.**

Statements	Reasons
2(x + 1) + 1 = x - 5 - 2	**Original Problem**
2x + 2 +1 = x - 7	*Distributive Property of Multiplication*
2x + 3 = x - 7	*Simplify; combine like terms*
x + 3 = -7	*Subtraction Property of Equality*
x = -10	*Subtraction Property of Equality*

2. **Directions: Solve the equation and justify each step in the solution.**

Statements	Reasons
3(x + 2) + 4x = 4(x + 2) + 4	**Original Problem**
3x +6 + 4x = 4x +8 +4	*Distributive Property of Multiplication*
7x + 6 = 4x + 12	*Simplify; combine like terms*
3x + 6 = 12	*Subtraction Property of Equality*
3x = 6	*Subtraction Property of Equality*
x = 2	*Division Property of Equality*

3. **Directions: Solve the equation and justify the solution. There is no value of x which will solve this equation.**

Statements	Reasons
2(x + 1) + 1 = (x - 5) + (x - 2)	**Original Problem**
2x +2 + 1 = 2x - 7	*Distributive Property of Multiplication; combine like terms*
2x + 3 = 2x - 7	*Simplify; combine like terms*
3 = -7	*Subtraction Property of Equality*

4. **Directions: Solve the equation and justify each step of the solution. This equation is true for all values of the variable. It is called an identity.**

Statements	Reasons
3(x - 1) - 2 = 4(x - 4) -(x - 11)	**Original Equation**
3x - 3 -2 = 4x - 16 - x + 11	*Distributive Property of Multiplication*
3x - 5 = 3x - 5	*Simplify; combine like terms*
-5 = -5	*Subtraction Property of Equality*
0 = 0	*Addition Property of Equality*
0 = 0	*Reflexive Property of Equality*

5. **Explain how you would transform the equation 7x - 3y = 12 into each of the following equations as you isolate the variable *x*. Each part (a, b, or c) represents another step in the process to isolate the variable *x*.**

   a. $0 = 12 - 7x + 3y$ b. $7x = 3y + 12$ c. $x = \frac{3}{7}y + \frac{12}{7}$

   a. Using the addition and subtraction properties of equality, subtract 7x from both sides of the equations and add 3y to both sides.

   b. Beginning from step a, using the addition property of equality, add 7x to both sides of the equation.

   c. Beginning from step b, using the division property of equality, divide both sides of the equation by 7.

6. **Explain how you would transform the equation 3x - 2y = 8 into each of the following equations.**

   a. $3x = 2y + 8$ b. $3x - 8 = 2y$ c. $\frac{3}{2}x - 4 = y$

   a. Using the addition property of equality, add 2y to both sides of the equation.

   b. Beginning from step a, using the subtraction property of equality, subtract 8 from both sides of the equation.

   c. Beginning from step b, using the division property of equality, divide both sides of the equation be 2 and simplify.

Unit 2, Activity 5 Linear Inequalities to Solve Problems

$2(m + 3) + 5 < 7(4 - m) - 5m$	Simplify both sides of the inequality using order of operations.
$2m + 6 + 5 < 28 - 7m - 5m$	Cannot simplify inside parentheses, so multiply using the distributive property Combine like terms
$2m + 11 < 28 - 12m$ $+12m \qquad\qquad +12m$	Bring the variables to the same side of the inequality – use the opposite operation (Add 12m or subtract 2m)
$14m + 11 < 28$ $\qquad -11 \quad -11$	Isolate the variable Subtract 11 from both sides
$\frac{14m}{14} < \frac{17}{14}$	Divide both sides by 14
$m < \frac{17}{14}$	Solution

Unit 2, Activity 6, Isolating Variables in Formulas

Isolating Variables in Formulas

Solve the equation or formula for the indicated variable.

1. $S = 5r^2t$, for t

2. $T = \frac{2U}{E}$, for U

3. $A = \frac{1}{2}bh$, for h

4. $P = 2l + 2w$, for l

5. $(y - y_1) = m(x - x_1)$, for m

6. $Ax + By = C$, for y

7. $C = \frac{5}{9}(F - 32)$, for F

8. $A = \frac{1}{2}(b_1 + b_2)$, for b_1

9. $4y + 3x = 7$, for x

10. $3y - 4x = 9$, for y

Solve the equation or formula for the indicated variable.

11. The formula for the time a traffic light remains yellow is $t = \frac{1}{8}s + 1$, where t is the time in seconds and s is the speed limit in miles per hour.
a. Solve the equation for s.
b. What is the speed limit at a traffic light that remains yellow for 4.5 seconds?

12. The length of a rectangle is 8 cm more than 3 times its width. The perimeter of the rectangle is 64 cm.
    a. Draw and label a diagram.

    b. What are the dimensions of the rectangle? Show your work.

    c. What is the area of the rectangle? Show your work

13. Air temperature drops approximately 5.5ºF for each 1,000-foot rise in altitude above Earth's surface (up to 30,000 ft).
    - **a.** Write a formula that relates temperature *t* in degrees Fahrenheit at altitude *h* (in thousands of feet) and a ground temperature of 65ºF. State any restrictions on *h*.
    - **b.** Find the temperature at 11,000 ft above Earth's surface.

Unit 2, Activity 6, Isolating Variables in Formulas with Answers

Isolating Variables in Formulas

Solve the equation or formula for the indicated variable.

1. $S = 5r^2t$, for *t* $\qquad t = \dfrac{S}{5r^2}$

2. $T = \dfrac{2U}{E}$, for *U* $\qquad U = \dfrac{TE}{2}$

3. $A = \dfrac{1}{2}bh$, for *h* $\qquad \dfrac{2A}{b} = h$

4. $P = 2l + 2w$, for *l* $\qquad \dfrac{P - 2w}{2} = l$

5. $(y - y_1) = m(x - x_1)$, for *m* $\qquad \dfrac{(y - y_1)}{(x - x_1)} = m$

6. $Ax + By = C$, for *y* $\qquad \dfrac{C - Ax}{B} = y$

7. $C = \dfrac{5}{9}(F - 32)$, for *F* $\qquad F = \dfrac{9}{5}C + 32$

8. $A = \dfrac{1}{2}(b_1 + b_2)$, for b_1 $\qquad b_1 = 2A - b_2$

9. $4y + 3x = 7$, for *x* $\qquad \dfrac{7 - 4y}{3} = x$

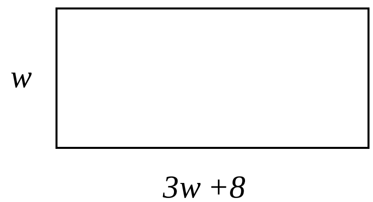
10. $3y - 4x = 9$, for *y* $\qquad y = \dfrac{9 + 4x}{3}$ or $y = 3 + \dfrac{4}{3}x$

Solve the equation or formula for the indicated variable.

11. The formula for the time a traffic light remains yellow is $t = \frac{1}{8}s + 1$, where *t* is the time in seconds and *s* is the speed limit in miles per hour.
    a. Solve the equation for *s*. $\qquad s = 8(t - 1)$
    b. What is the speed limit at a traffic light that remains yellow for 4.5 seconds?
    s = 28 miles per hour

12. The length of a rectangle is 8 cm more than 3 times its width. The perimeter of the rectangle is 64 cm.

a. Draw and label a diagram.



w = width; 3w + 8 = length

b. What are the dimensions of the rectangle? Show your work.

$$P = 2w + 2l$$
$$64 = 2w + 2(3w + 8)$$
$$64 = 2w + 6w + 16$$
$$48 = 8w$$
$$6 \text{ cm} = w$$
$$26 \text{ cm} = \text{length}$$

c. What is the area of the rectangle? Show your work

$$A = lw$$
$$A = 6 \times 26$$
$$A = 156 \text{ cm}^2$$

13. Air temperature drops approximately 5.5ºF for each 1,000-foot rise in altitude above Earth's surface (up to 30,000 ft).

a. Write a formula that relates temperature *t* in degrees Fahrenheit at altitude *h* (in thousands of feet) and a ground temperature of 65ºF. State any restrictions on *h*.

t = temperature; h = height in number of thousands of feet

Formula: t = 65 – 5.5h

b. Find the temperature at 11,000 ft above Earth's surface.

t = 65 – 5.5(11); t = 4.5 degrees Celsius

Solving A Real World Application Problem Using A Formula

1. Directions: Read the problems below. Follow carefully the student problem solver's strategy as he solves the problems below using algebraic methods for transforming equations and formulas.

Have you ever wondered what happens to temperature as you go into a mine? Sometimes the temperature is very hot. In a Chilean coal mine, the temperature registers 90°F (32°Celsius) at a depth of 688 meters. Why would it matter how hot/cold the temperature in a mine is?
____

Scientists use formulas to determine the temperature at various depths inside mine. A typical formula indicates that temperature rises 10 degrees Celsius per kilometer travelled into the mine. Suppose the surface temperature of the mine is 22° Celsius, and the temperature at the bottom of the mine is 45° Celsius. What is the depth of the mine in kilometers?

What to think...	What to write...
Given: I must read the problem carefully to understand what information is given to me. I will write the information in an organized manner.	Surface Temperature = 22°C Bottom of Mine Temperature = 45°C Temperature increases 10 degrees for each kilometer that you go down.
Process: Since the temperature increases 10 degrees for every kilometer that I go down, I have to multiply 10 times the number of the kilometers to relate the depth and temperature. I will then have to add this value to the surface temperature.	s = Surface temp d = Depth b = Bottom temp $s + 10d = b$
I will develop the equation from the process. Since 22 is the surface temperature and 45 is the bottom temperature, I can use those values in the equation.	$22 + 10d = 45$
I need to solve the formula for d.	$22 + 10d = 45$ $-22 \qquad - 22$ $\frac{10}{10}d = \frac{23}{10}$ $d = 2.3$ km

At a depth of 2.3 km the temperature is 45° Celsius.

2. Now try this problem using this method of problem solving using a formula.

The temperature on a ski slope decreases 2.5° Fahrenheit for every 1000 feet you are above the base of the slope. If the temperature at the base is 28° and the temperature at the summit is 24° degrees. How many thousand feet is the summit above the base?

What to think...	What to write...
Given: I must read the problem carefully to understand what information is given to me. I will write the information in an organized manner.	
Process: Since the temperature ___________ degrees for every foot that I go ______, I have to _________ times the number of 1000s of feet to relate the height and temperature. I will then have to _______ this value from the _______ temperature.	
I will develop the equation from the process using the values I know from the problem.	
I need to solve the formula for x.	

At a height of _______ the temperature is ___________________.

3. Some problems involve geometric formulas. Suppose a rectangle has a perimeter of 96 centimeters. What is the formula for determining the perimeter of that shape? ____

The width of the rectangle is 2 less than its length. Determine the length and the width of the shape. Also, determine its area.

First, draw and label a diagram before you begin to solve the problem.

Wanted: l = length and w = width of the rectangle

What to think...	What to write...
Given:	

Unit 2, Activity 7, Solving Real World Application Problems Using a Formula

Process:	
I will develop the equation from the formula.	
I need to solve the formula for _____.	

If the perimeter of the rectangle is 96 centimeters, its length is ___________________________; its width is ____.

After you have found the dimensions of the rectangle, determine its area.
____

Unit 2, Activity 7, Solving Real world Application Problems Using a Formula with Answers

Solving A Real World Application Problem Using A Formula

1. Directions: Read the problems below. Follow carefully the student problem solver's strategy as he solves the problems below using algebraic methods for transforming equations and formulas.

Have you ever wondered what happens to temperature as you go into a mine? Sometimes the temperature is very hot. In a Chilean coal mine, the temperature registers 90°F (32°Celsius) at a depth of 688 meters. Why would it matter how hot/cold the temperature in a mine is?
Answers will vary.

Scientists use formulas to determine the temperature at various depths inside mine. A typical formula indicates that temperature rises 10 degrees Celsius per kilometer travelled into the mine. Suppose the surface temperature of the mine is 22° Celsius, and the temperature at the bottom of the mine is 45° Celsius. What is the depth of the mine in kilometers?

What to think...	What to write...
Given: I must read the problem carefully to understand what information is given to me. I will write the information in an organized manner.	Surface Temperature = 22°C Bottom of Mine Temperature = 45°C Temperature increases 10 degrees for each kilometer that you go down.
Process: Since the temperature increases 10 degrees for every kilometer that I go down, I have to multiply 10 times the number of the kilometers to relate the depth and temperature. I will then have to add this value to the surface temperature.	s = Surface temp d = Depth b = Bottom temp $s + 10d = b$
I will develop the equation from the process. Since 22 is the surface temperature and 45 is the bottom temperature, I can use those values in the equation.	$22 + 10d = 45$
I need to solve the formula for d.	$22 + 10d = 45$ $-22 \qquad -22$ $\frac{10}{10}d = \frac{23}{10}$ $d = 2.3$ km

At a depth of 2.3 km the temperature is 45° Celsius.

Unit 2, Activity 7, Solving Real world Application Problems Using a Formula with Answers

2. Now try this problem using this method of problem solving using a formula.

The temperature on a ski slope decreases 2.5° Fahrenheit for every 1000 feet you are above the base of the slope. If the temperature at the base is 28° and the temperature at the summit is 24° degrees. How many thousand feet is the summit above the base?

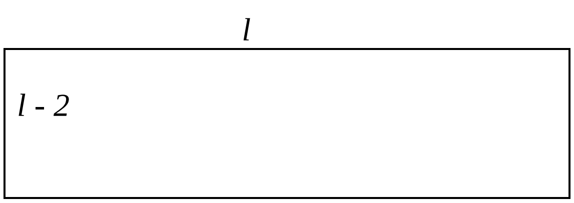
What to think...	What to write...
Given: I must read the problem carefully to understand what information is given to me. I will write the information in an organized manner.	*2.5: the amount the temperature drops for each 1000 kilometers* *28: the base temperature* *24: the summit temperature*
Process: Since the temperature *decreases 2.5* degrees for every foot that I go *up*, I have to *multiply 2.5* times the number of 1000s of feet to relate the height and temperature. I will then have to *subtract* this value from the *base* temperature.	*Base temperature = b* *Summit temperature = s* *Distance above base (in 1000's) = d* $b - 2.5d = s$
I will develop the equation from the process using the values I know from the problem.	$28 - 2.5d = 24$
I need to solve the formula for *d.*	*d = 1.6 thousand feet (or 1,600 feet)*

At a height of *1,600 feet* the temperature is *24 degrees.*

3. Some problems involve geometric formulas. Suppose a rectangle has a perimeter of 96 centimeters. What is the formula for determining the perimeter of that shape?
P=2l + 2w

The width of the rectangle is 2 less than its length. Determine the length and the width of the shape. Also, determine its area.

First, draw and label a diagram before you begin to solve the problem.



Wanted: *l* = length and *w* = width of the rectangle

Unit 2, Activity 7, Solving Real world Application Problems Using a Formula with Answers

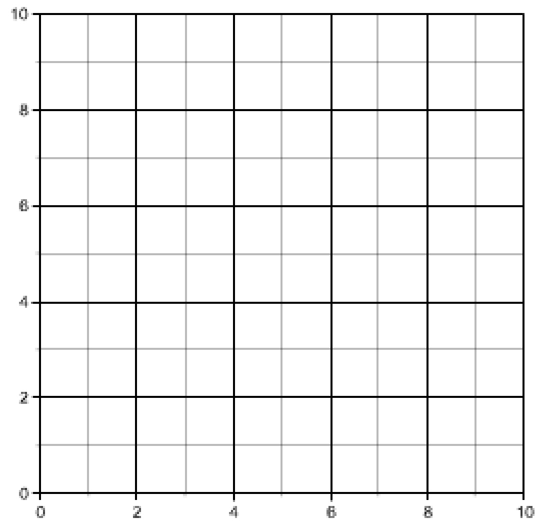
What to think...	What to write...
Given: *Perimeter is 96 cm*	$P = 2l + 2w$ $w = l - 2$ $P = 96$ *cm*
Process: *Multiply the length and width each by 2.. Then add to find the perimeter. To find the length and width solve the equation for l.*	$P = 2l + 2w$
I will develop the equation from the formula. *Substitute the expression for width into the perimeter formula*	$P = 2l + 2(l - 2)$
I need to solve the formula for *l.*	$l = 25$ *cm* $w = 23$ *cm*

If the perimeter of the rectangle is 96 centimeters, its length is *25 cm*; its width is *23 cm.*

After you have found the dimensions of the rectangle, determine its area. *Area: 575* cm^2

This is a chart of all of the hours worked, *h*, and the total pay, *p*, in your paycheck.

h	1	2	3	4	5	6
p	6.00	12.00	18.00	24.00	30.00	36.00



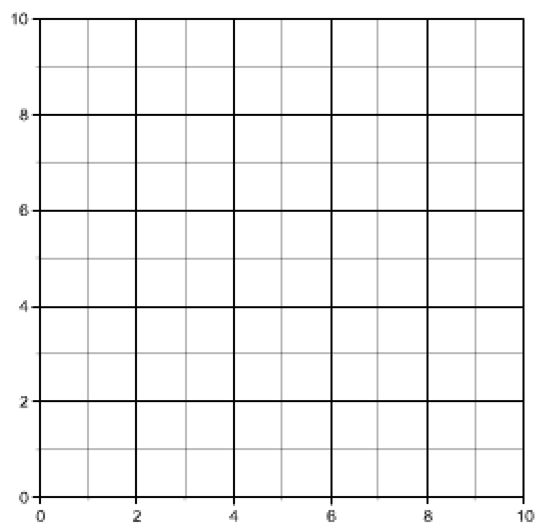
1. Please plot these points on the graph.
2. Is the graph linear? ___________________________
3. Does the line go through the origin? ______________
4. What is the rate of change? _______________
5. What is the real-life meaning of the rate of change of this linear relationship?

____

6. Write an equation to model this situation.__________
7. If you need to earn $60.00 to buy school supplies, how many hours will you need to work? _________

This is a chart of all of the gallons of gas bought, *g*, and the total price, *p*, of your purchase.

g	1	2	3	4	5	6
p	3.25	6.50	9.75	13.00	16.25	19.50



8. Please plot these points on the graph.
9. Is the graph linear? ___________________________
10. Does the line go through the origin? _____________
11. What is the rate of change? _______________
12. What is the real-life meaning of the rate of change of this linear relationship?

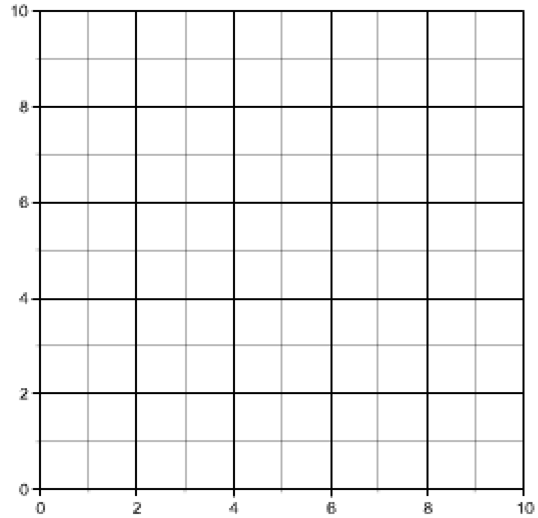
____

13. Write an equation to model this situation._________
14. If you have exactly $65.00 to spend on gas, how many gallons will you be able to buy? _______

Unit 2, Activity 8, Linear Relationships

This is a chart of minutes you talk on your cell phone, *m*, and the total charge, *c*, of your cell phone bill.

m	1	2	3	4	5	6
c	.10	.20	.30	.40	.50	.60



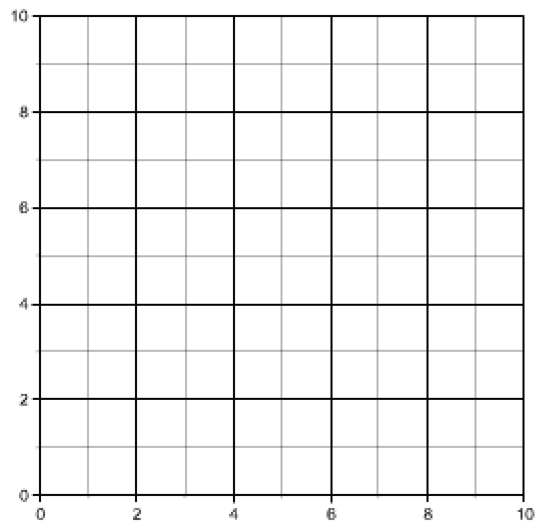
15. Please plot these points on the graph.
16. Is the graph linear? ___________________________
17. Does the line go through the origin? _____________
18. What is the rate of change? _______________
19. What is the real-life meaning of the rate of change of this linear relationship?

____

20. Write an equation to model this situation.__________
21. If your budget for cell phone use is $20.00, exactly how many minutes are you able to talk? __________

This is a chart profit, *p*, you will make if you have a fundraiser selling t-shirts, *t*.

t	4	8	12	16	20	24
p	10.00	20.00	30.00	40.00	50.00	60.00



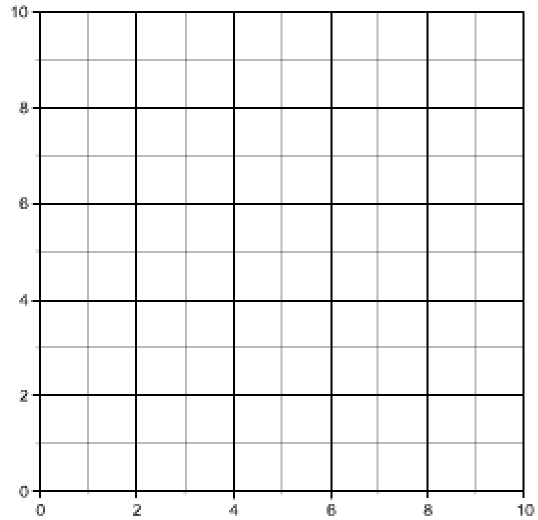
22. Please plot these points on the graph.
23. Is the graph linear? ___________________________
24. Does the line go through the origin? _____________
25. What is the rate of change? _______________
26. What is the real-life meaning of the rate of change of this linear relationship?

____

27. Write an equation to model this situation.__________
28. If your goal is to make a profit of $100.00 for your club, how many shirts must you sell? _______________

Unit 2, Activity 8, Linear Relationships Keeping It Real with Answers

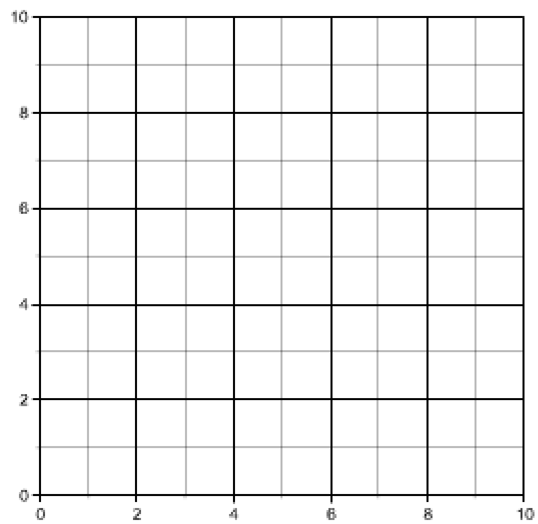
This is a chart of all of the hours worked, *h*, and the total pay, *p*, in your paycheck.



h	1	2	3	4	5	6
p	6.00	12.00	18.00	24.00	30.00	36.00

1. Please plot these points on the graph.
2. Is the graph linear? ______*yes*____________________
3. Does the line go through the origin? ____*yes*_______
4. What is the rate of change? _____*6.00*___
5. What is the real-life meaning of the rate of change of this linear relationship?
   For each hour worked, the pay increases $6.00
6. Write an equation to model this situation.__*p = 6h*__
7. If you need to earn $60.00 to buy school supplies, how many hours will you need to work? __*10 hours*

This is a chart of all of the gallons of gas bought, *g*, and the total price, *p*, of your purchase.



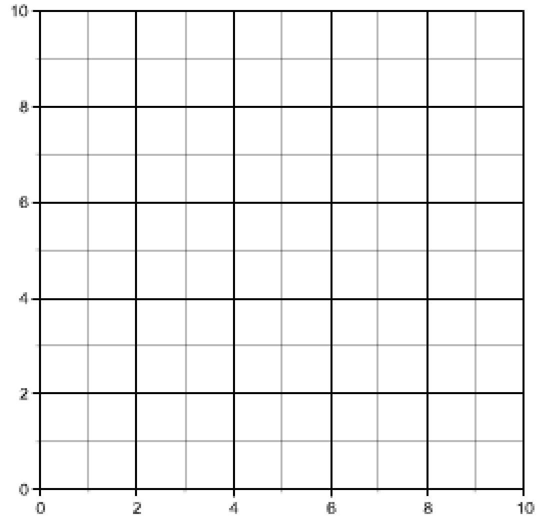
g	1	2	3	4	5	6
p	3.25	6.50	9.75	13.00	16.25	19.50

8. Please plot these points on the graph.
9. Is the graph linear? _________*yes*__________________
10. Does the line go through the origin? ____*yes*______
11. What is the rate of change? ______*3.25*_____
12. What is the real-life meaning of the rate of change of this linear relationship?
    Every gallon of gas costs $3.25
13. Write an equation to model this situation. __*p = 3.25g*
14. If you have exactly $65.00 to spend on gas, how many gallons will you be able to buy?
    20 gallons

Unit 2, Activity 8, Linear Relationships Keeping It Real with Answers

This is a chart of minutes you talk on your cell phone, *m*, and the total charge, *c*, of your cell phone bill.

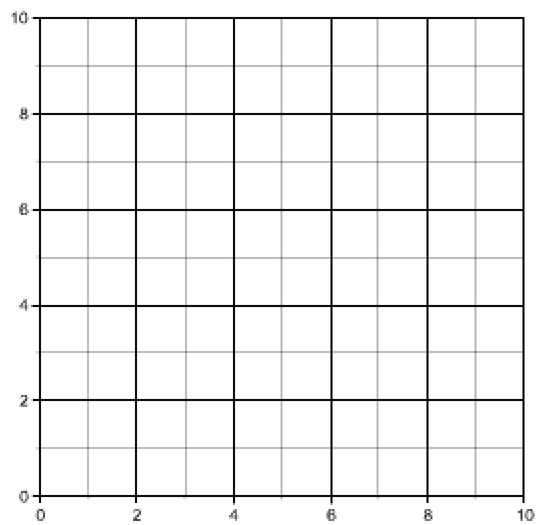
m	1	2	3	4	5	6
c	.10	.20	.30	.40	.50	.60



15. Please plot these points on the graph.
16. Is the graph linear? _______________*yes*__________
17. Does the line go through the origin? ______*yes*_____
18. What is the rate of change? ____*0.10*_____
19. What is the real-life meaning of the rate of change of this linear relationship?
    Each minute on the cell phone costs 10 cents
20. Write an equation to model this situation. *c = 0.10m*
21. If your budget for cell phone use is $20.00, exactly how many minutes are you able to talk? *200 minutes*

This is a chart profit, *p*, you will make if you have a fundraiser selling t-shirts, *t*.

T	4	8	12	16	20	24
P	10.00	20.00	30.00	40.00	50.00	60.00



22. Please plot these points on the graph.
23. Is the graph linear? _________*yes*_______________
24. Does the line go through the origin? _____*yes*______
25. What is the rate of change? ___*2.50*______
26. What is the real-life meaning of the rate of change of this linear relationship?
    The profit made on each t-shirt is $2.50
27. Write an equation to model this situation.__*p = 2.5t*_
28. If your goal is to make a profit of $100.00 for your club, how many shirts must you sell? ____*40 t-shirts*___

Unit Conversion

In this activity, you will use data about the heights of the ten tallest mountains in the world.

Mountain		Height		Location
1	Mount Everest	8,850m	29,035 ft	Nepal
2	Qogir (K2)	8,611m	28,250 ft	Pakistan
3	Kangchenjunga	8,586m	28,169 ft	Nepal
4	Lhotse	8,501m	27,920 ft	Nepal
5	Makalu I	8,462m	27,765 ft	Nepal
6	Cho Oyo	8,201m	26,906 ft	Nepal
7	Dhaulagiri	8,167m	26,794 ft	Nepal
8	Manaslu I	8,156m	26,758 ft	Nepal
9	Nanga Parbat	8,125m	26,658 ft	Pakistan
10	Annapurna I	8,091m	26,545 ft	Nepal

Use the graph below to create a scatter plot of the data. Use meters as your independent variable and feet as your dependent variable. Be sure to label both axes.

Does the data represent a linear or non-linear relationship?

What is the rate of change of the line?

What does the rate of change represent in real-life terms?

Write an equation for the linear relationship. Let x represent meters and y represent feet.

Use your equation to determine the length in meters of a football field.

Unit 2, Activity 9, Unit Conversion

The rate of change is the same as the ________________ of the line.

Use what you discovered about the equation for the relationship between meters and feet and write a direct variation equation for the relationship between miles and kilometers.

Use your equation to determine how many miles are in 10 kilometers?

Reflect on the following statement:

All unit conversions are linear relationships.

In your math log, write a paragraph explaining why you agree or disagree with the statement. Include examples to justify your position.

Unit 2, Activity 9 Unit Conversion with Answers

Unit Conversion

In this activity, you will use data about the heights of the ten tallest mountains in the world.

Mountain		Height		Location
1	Mount Everest	8,850m	29,035 ft	Nepal
2	Qogir (K2)	8,611m	28,250 ft	Pakistan
3	Kangchenjunga	8,586m	28,169 ft	Nepal
4	Lhotse	8,501m	27,920 ft	Nepal
5	Makalu I	8,462m	27,765 ft	Nepal
6	Cho Oyo	8,201m	26,906 ft	Nepal
7	Dhaulagiri	8,167m	26,794 ft	Nepal
8	Manaslu I	8,156m	26,758 ft	Nepal
9	Nanga Parbat	8,125m	26,658 ft	Pakistan
10	Annapurna I	8,091m	26,545 ft	Nepal

Use the graph below to create a scatter plot of the data. Use meters as your independent variable and feet as your dependent variable. Be sure to label both axes.

Does the data represent a linear or non-linear relationship?

Linear

What is the rate of change of the line?

3.28

What does the rate of change represent in real-life terms?

1 meter = 3.28 feet

Write an equation for the linear relationship. Let x represent meters and y represent feet.

$y = 3.28x$

Use your equation to determine the length in meters of a football field. *91.4 meters*

Unit 2, Activity 9 Unit Conversion with Answers

The rate of change is the same as the *slope*_____ of the line.

Use what you discovered about the equation for the relationship between meters and feet and write a direct variation equation for the relationship between miles and kilometers.

Let y = km and x = miles. $y = 1.6x$

Use your equation to determine how many miles are in 10 kilometers?

6.25 miles

Reflect on the following statement:

All unit conversions are linear relationships.

In your math log, write a paragraph explaining why you agree or disagree with the statement. Include examples to justify your position.

All unit conversions are linear relationship. Justifications will vary.

1. Rashaun has an overdue library book, and he is being charged $.25 for each day that it is overdue. Graph the total amount that he owes for his book as each day passes.

2. Jose is driving 65 miles per hour. Graph the distance that he has traveled as each hour passes.

3. Katherine wants to take her friends to a movie but only has a certain amount of money. Each movie ticket costs $6.50. Graph the total amount that she will spend on movie tickets if she takes f friends to a movie.

4. Courtney is renting a car to drive to another state. She is not sure how many days she will need the car. The cost of renting the car is $18 per day. Graph the total cost of renting the car as each day passes.

5. Drew is catering a party for his friends. He needs to buy grapes to use for his fruit tray. A pound of grapes cost $1.25 per pound. Graph the total cost for the grapes.

6. Ralph needs to give medicine to his pet hamster, Julian. The dosage says to administer 3 mgs each hour. Graph the total amount of medicine that Ralph gave to his hamster.

7. Jordan is piloting a hot air balloon that is rising at a rate of 500 feet per hour. Graph the height of the balloon.

8. One mile is the same as 1.6 kilometers. If John travels m miles, how many kilometers has he traveled?