

Warm Up

10/27

Make a prediction:

Students who play an instrument are more or less likely to also play a sport.

Write your prediction on the slip of paper you are given.

Homework Questions?

Helpful Hint: Write proportions so your unknown (what you are solving for) is in the numerator (on top).

Proportions Practice

For each problem, make a key. Then write the proportion and solve. Be sure to include units in your answer.

- 1.) Three pumps can remove a total of 1700 gallons of water per minute from a flooded mineshaft. If engineers want to remove at least 5500 gallons per minute, how many pumps will they need operating?

$$\frac{\text{\# of pumps}}{\text{gallons/min}}$$

$$\frac{(5500)}{1} \cdot \frac{3}{1700} = \frac{X}{5500} \cdot \frac{(5500)}{1}$$

$$9.7 = X$$

They will need ten pumps working.

- 2.) Geologists in Antarctica find an average of 7 meteorite fragments in every 500 tons of gravel they sift through. How much gravel must they sift through in order to get 100 fragments?

$$\frac{\text{tons of gravel}}{\text{\# of fragments}}$$

$$(100) \frac{500}{7} = \frac{X}{100} (100)$$

$$7142.9 = X$$

They must sift through 7142.9 tons of gravel.

- 3.) The ratio of boys to girls in Ms. Alper's math classes is 5 : 7. If there are 60 students in all of her classes, how many are boys?

5:7
There are 5 boys for every 7 girls.
5 boys out of 12 total.

$$\frac{\text{Boys}}{\text{Total Kids}}$$

$$(60) \frac{5}{12} = \frac{X}{60} (60)$$

$$25 = X$$

There would be 25 boys in a class of 60.

- 4.) A cookie recipe calls for 3 eggs and makes 4 dozen cookies.

- a. How many (dozen) cookies could you make with a dozen eggs?

$$\frac{\text{Dozen Cookies}}{\text{\# of eggs}}$$

$$(12) \frac{4}{3} = \frac{X}{12} (12)$$

$$16 = X$$

You can make 16 dozen cookies with one dozen (12) eggs.

- b. How many eggs would you need to make 18 dozen cookies?

$$\frac{\text{\# of eggs}}{\text{dozen cookies}}$$

$$(18) \frac{3}{4} = \frac{X}{18} (18)$$

$$13.5 = X$$

You will need 13.5 eggs to make 18 dozen cookies.

Notice how the ratios are flipped based on the problem.

- 5.) A case of 24 tennis balls weighs 3 pounds. How much would a shipment of 2560 tennis balls weigh?

weight
tennis balls

$$(2560) \frac{3}{24} = \frac{x}{2560} \quad (2560)$$

$$320 = x$$

2560 tennis balls
weigh 320 pounds.

- 6.) A map of Connecticut is drawn to a scale where 2 inches on the map represents 35 miles.

- a. If Greenwich and Stonington are 105 miles from each other, how far apart do they appear on the map?

inches
mile

$$(105) \frac{2}{35} = \frac{x}{105} \quad (105)$$

$$6 = x$$

Greenwich and Stonington are
6 inches apart on the graph.

- b. On this same map the road from Mystic to Hartford is 1½ inches long. How far apart are Mystic and Hartford?

miles
inch

$$(1.5) \frac{35}{2} = \frac{x}{1.5} \quad (1.5)$$

$$26.25 = x$$

Mystic and Hartford are
26.25 miles apart.

- 7.) A bag of 8 apples costs \$1.50 at Sam's Orchard.

- a. At this same rate, how much would 18 apples cost?

cost
of apples

$$(18) \frac{1.5}{8} = \frac{x}{18} \quad (18)$$

$$3.375 = x$$

18 apples would cost
approximately \$3.38.

- b. How many apples could you buy for \$5.00?

of apples
cost

$$(5) \frac{8}{1.5} = \frac{x}{5} \quad (5)$$

$$26.7 = x$$

You could buy about
27 apples for \$5.

- c. What is the unit cost per apple?

cost
of apples

$$\frac{1.5}{8} = \frac{x}{1}$$

$$0.19 = x$$

One apple costs 19 cents.

Notice how the ratios are
flipped based on the problem.

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flipped based on the problem.

8.) Emily can ride her scooter 18 miles in 50 minutes.

120 minutes

a. At this same rate (speed) how far can she ride in two hours?

$$\frac{\text{miles}}{\text{minute}}$$

$$(120) \frac{18}{50} = \frac{x}{120}$$

$$43.2 = x$$

She can ride 43.2 miles in 2 hours.

b. How long would it take for her to ride 4 miles?

$$\frac{\text{minutes}}{\text{miles}}$$

$$(4) \frac{50}{18} = \frac{x}{4}$$

$$11.1 = x$$

It would take 11.1 minutes to ride 4 miles.

c. What is her unit rate in miles per hour?

$$\frac{\text{miles}}{\text{minute}}$$

$$(60) \frac{18}{50} = \frac{x}{60}$$

$$21.6 = x$$

60 minutes = 1 hour

The unit rate is 21.6 miles per hour.

9.) Will's Widget Works can produce 2½ tons of widgets in an 8 hour work day.

a. How many widgets can Will's Widget Works produce between 9 am and noon?

$$\frac{\text{tons of widgets}}{\text{hours}}$$

$$(3) \frac{2.5}{8} = \frac{x}{3}$$

$$0.94 = x$$

3 hours

They would produce 0.94 tons of widgets.

b. McGee Manufacturing, Inc. needs to order 17 tons of widgets. How many work days will it take Will's Widget works to fill this order?

$$\frac{\text{hours}}{\text{tons of widgets}}$$

$$(17) \frac{8}{2.5} = \frac{x}{17}$$

$$54.4 = x$$

total hours

$$54.4 \div 8 = 6.8 \text{ work days}$$

It would take 6.8 8-hour work days to fill the order.

Notice how the ratios are flipped based on the problem.

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- 10.) The Jakobshavn Glacier in Greenland, reputed to be the fastest in the world, has sped up lately (perhaps due to global warming?). The last accurate measurements have it travelling at 5.25 kilometers (5250 meters) in a five month period. At this rate, how far does it travel in a year?

km
month

$$\begin{array}{l} (12) \frac{5.25}{5} = \frac{x}{12} (12) \\ 12.6 = x \end{array} \quad \leftarrow 12 \text{ months} = 1 \text{ year}$$

At this rate, the glacier would travel 12.6 km in one year.

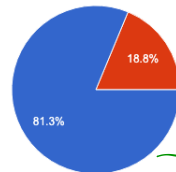
A block

Collecting our data:

How is the best way to present our data?

I play a sport but not an instrument
16 responses

(13)



True
False

$$\frac{\text{Part}}{\text{Whole}} = \frac{81.3}{100} = \frac{x}{16}$$

$$x = 13$$

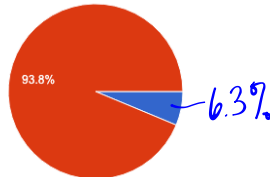
$$(16) 0.813 = \frac{x}{16}$$

$$13 = x$$

written as
a decimal

I play an instrument but not a sport
16 responses

(1)



True
False

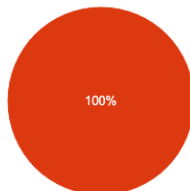
$$\frac{6.3}{100} = \frac{x}{16}$$

$$0.063 = \frac{x}{16}$$

$$(16)(0.063) = 1$$

I play a sport & an instrument
16 responses

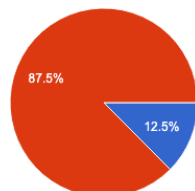
(0)



True
False

I play neither an instrument or a sport
16 responses

(2)



True
False

$$0.125(16) = 2$$

A block

Name: _____

Block: _____

Date: _____

Frequency Tables – Day 1

Frequency is the measure of the number of occurrences, or how many times something has happened.

Problem 1 - Students Playing Instruments and Students Playing Sports

Predict:

Using the data from your survey, answering the questions:

- Do you play a sport?
- Do you play a musical instrument?

Fill in the values on the table below:

	Plays Instrument	Does Not play instrument	
Play Sport	0	13	13
Does Not Play Sport	1	2	3
	1	15	16

When completing the following questions, provide numerical evidence used to formulate your answer.

What is the frequency of:

1. People who play a sport?

13 total

2. People who play an instrument?

1

3. People who play a sport and an instrument?

0

4. How many are in the class?

16

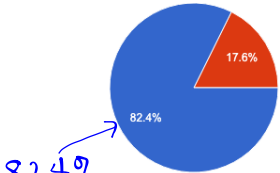
B block

Collecting our data:

How is the best way to present our data?

I play a sport but not an instrument
17 responses

14



True
False

Part
whole

$$(17) \frac{82.4}{100} = \frac{x}{17}$$

$$14 = x$$

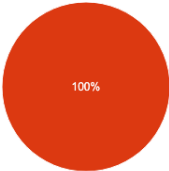
% of a number:

$$\left(\begin{matrix} \% \text{ written} \\ \text{as a} \\ \text{decimal} \end{matrix} \right) (\text{number})$$

$$(0.824)(17) = 14$$

I play an instrument but not a sport
17 responses

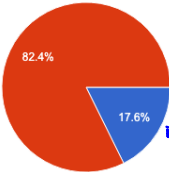
0



True
False

I play a sport & an instrument
17 responses

3

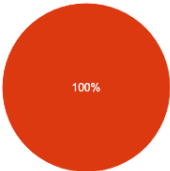


True
False

$$0.176(17) = 3$$

I play neither an instrument or a sport
17 responses

0



True
False

B block

Block: _____ Date: _____

Frequency Tables – Day 1

Frequency is the measure of the number of occurrences, or how many times something has happened.

Problem 1 - Students Playing Instruments and Students Playing Sports

Predict:

Using the data from your survey, answering the questions:

- Do you play a sport?
- Do you play a musical instrument?

Fill in the values on the table below:

	Plays Instrument	Does Not play instrument	Total
Play Sport	3	14	17
Does Not Play Sport	0	0	0
Total	3	14	17

When completing the following questions, provide numerical evidence used to formulate your answer.

What is the frequency of:

1. People who play a sport?

17

2. People who play an instrument?

3

3. People who play a sport and an instrument?

3

4. How many are in the class?

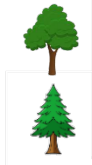
17

Problem 2 - Tree Type & Height - Analyzing data in two-way tables

Predict:

Do you think deciduous & evergreen trees have different heights in general? What evidence could you give as support?

An ecologist is studying a forest with a mixture of tree types. Since the average tree height in the area is 40 feet, he measures the height of the tree against that. He also records the type of tree. The table below shows the types & heights of the trees measured



	Under 40 feet	Exactly 40 feet	Taller than 40 feet
Deciduous	42	4	30
Evergreen	42	2	15

A. Use the table above. Do you think each statement is true or false?

1. Deciduous & Evergreen trees are equally likely to be under 40 feet.

True

False

2. Deciduous trees are more likely than Evergreen trees to be exactly 40 feet.

True

False

3. Deciduous trees are more likely to be taller than 40 feet.

True

False

4. Evergreen trees are only half as likely as deciduous trees to be taller than 40 feet.

True

False

What might be misleading or confusing about the way data is presented in this table?

B. Study the table of tree types and heights.

Copy and complete this extended table.

	Under 40 feet	Exactly 40 feet	Taller than 40 feet	Total
Deciduous	42	4	30	76
Evergreen	42	2	15	59
Total				

Why are the category totals important?

C. One way to compare groups with unequal numbers is to find fractions or percentages.

Complete the table below to show the fractions or percentages by row for each category.

	Under 40 feet	Exactly 40 feet	Taller than 40 feet	Total
Deciduous	$\frac{42}{76} = \frac{21}{38} = 55.2\%$	$\frac{4}{76} =$	$\frac{30}{76} =$	
Evergreen				

Use the values from the table above to revisit your answers to Question A. **Justify your answer.**

1. Deciduous & Evergreen trees are equally likely to be under 40 feet. True or False?
2. Deciduous trees are more likely than Evergreen trees to be exactly 40 feet. True or False?
3. Deciduous trees are more likely to be taller than 40 feet. True or False?
4. Evergreen trees are only half as likely as deciduous trees to be taller than 40 feet. True or False?

Problem 3 - Let's go back to data collected from E and F blocks:

	Plays Instrument	Does Not play instrument	Total
Play Sport	11	17	
Does Not Play Sport	2	2	
Total			

Show your work to answer the following problems:

1. How likely is it that a student plays a sport?
2. How likely is it that a student plays an instrument?
3. How likely is it that a student doesn't play a sport or an instrument?
4. How likely is it that a student who plays a sport, does not play an instrument?
5. Is a student who plays a sport more likely to play an instrument than a student who does not play a sport? (You will compare 2 ratios.)
6. Is a student who does not play an instrument more likely to play a sport than a student who does play an instrument? (You will compare 2 ratios.)

Homework

Finish classwork