TOPIC 5

LESSON 5.2b

Warming the Bench

Objective: Using Estimation and Benchmark Percents

Warm-Up

Compute each product.

1. $\frac{1}{10} \times 670$

2. $\frac{1}{100} \times 670$

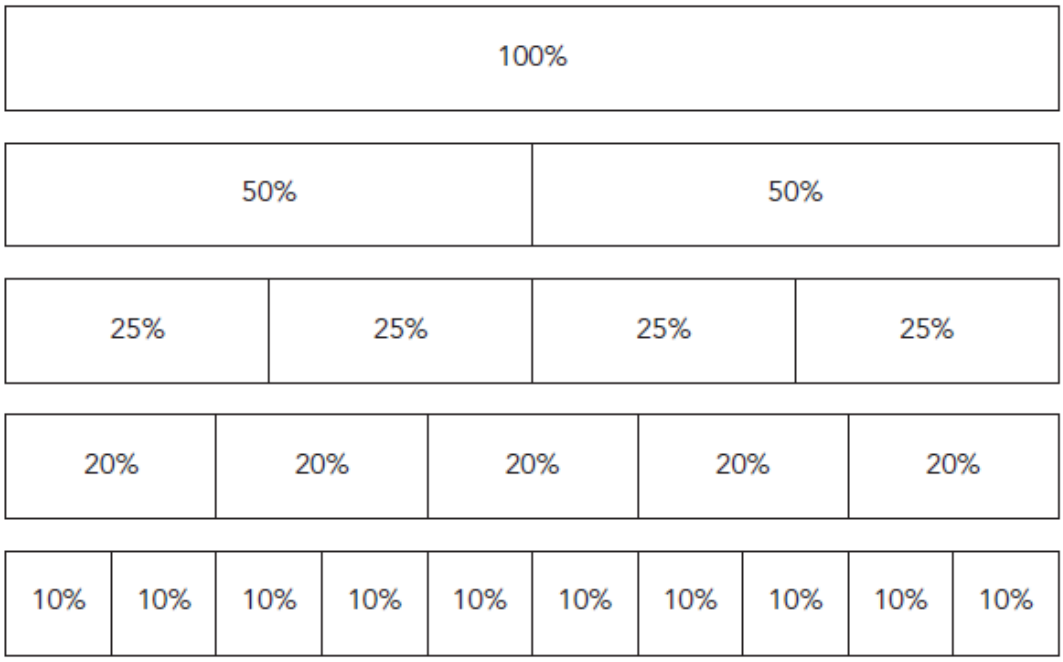
3. $\frac{1}{1000} \times 670$

4. $\frac{1}{10000} \times 670$

EXPLORE 3

Benchmark Percents

A benchmark percent is a percent that is commonly used, such as 1%, 5%, 10%, 25%, 50%, and 100%. With fractions and decimals, benchmarks can be used to make estimations. With percents, however, you can use benchmarks to calculate any whole percent of a number.



1. Use the tape diagram to state each relationship.

a. How is 50% related to 100%?

b. How is 25% related to 100%? How is 25% related to 50%?

c. How is 10% related to 100%? How is 10% related to 50%?

2. Continue the pattern from the tape diagram to state each relationship.

a. How is 5% related to 10%?

b. How is 1% related to 10%? How is 1% related to 5%?

3. Use the benchmark percents to determine each value if 600 is 100%.

a. 50%

b. 25%

c. 10%

d. 5%

e. 1%

4. Use your calculator to determine the percent of each number.

a. 1% of 28 =

b. 10% of 28 =

c. 1% of 234 =

d. 10% of 234 =

e. 1% of 0.85 =

f. 10% of 0.85 =

g. 1% of 5.86 =

h. 10% of 5.86 =

i. 1% of 98.72 =

j. 10% of 98.72 =

k. 1% of 1085.2 =

l. 10% of 1085.2 =

5. What patterns do you notice in your answers in Question 4?

6. Write a rule to calculate 1% of any number.

7. Write a rule to calculate 10% of any number.

8. Use the patterns you recognized in Question 4 to calculate each value.

a. 10% of 45.21

b. 1% of 45.21

c. 10% of 0.72

d. 1% of 0.72

e. 10% of 2854

f. 1% of 2854

EXPLORE 4

Determining Percents using Benchmarks

Deciding how much tip to leave a server at a restaurant is one way that percents are used in the real world.

Akuro eats at the Eat and Talk Restaurant and decides to leave a 15% tip. Akuro says, "I can easily calculate 10% of any number, and then calculate half of that, which is equal to 5%. I can then add those two percent values together to get a sum of 15%."

1. Is Akuro's method reasonable?

2. How much should he leave for a tip of 15% on $16.00?

3. What is 15% of each restaurant check total given? Explain how you calculated your answer. Round to the nearest hundredth if necessary.

a. $24.00 b. $32.56 c. $47.00

You can determine any whole percent of a number by using 10%, 5%, and 1%.

4. How can you use 10%, 5%, and/or 1% to determine each percent given? Explain your reasoning.

a. 18% b. 25% c. 37%

5. Calculate each value using 1%, 5%, and 10%.

a. 27% of 84

b. 43% of 116

c. 98% of 389

d. 77% of 1400

e. 12% of 1248

6. About 12% of the United States population is left-handed. Use this estimate to determine about how many left-handed students there would be for each class of the given size.

a. 150 students

b. 200 students

c. 375 students

Show You KNOW

Brain Weights

A chimpanzee's brain weight can be compared to the brain weight of other mammals. Assume that the weight of an average chimpanzee's brain is 400 grams. The table provides the average brain weight of various mammals as a percent of a chimp's brain weight.

	Lion	Sheep	Cat	Rabbit	Human	Bear
Average Brain Weight as a Percentage of a Chimp's Brain Weight	60%	35%	7%	2.5%	350%	119%
Average Brain Weight (grams)						

1. Order from least to greatest the brain weights of the mammals in the table, along with the chimpanzee, based on percents.

2. Use benchmarks to determine the average brain weights for each animal. Show all of your work.

3. Does the order of the percents match the order of the brain weights? Why or why not?

Name: _____ Date: _____ Class: _____

Homework HW

LESSON 5.2b

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Objective Using Estimation and Benchmark Percents

Practice

The students at Penncrest Middle School sold various products for a fall fundraiser. The table shows the percent of profit the school earned and the total amount sold for each type of product.

Product	Percent Profit	Amount Sold
Candy	65%	$6400
Wrapping paper	40%	$1200
Stationery	50%	$900
Calendars	25%	$3120

1. Use benchmark percents to calculate the amount of profit the school earned on the sale of each product.
   a. Candy
   b. Wrapping paper
   c. Stationary
   d. Calendars

2. Suppose that the students also sold $4500 worth of pens and pencils, which earned a 42% profit. Calculate the profit the school earned on pens and pencils.