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Wording for the legal statement above is adapted from the legal statement for *Trigonometry*, published in 2009 by The cK-12 Foundation: <http://about.ck12.org/>

* Note: You need to look at the accompanying PowerPoint presentation, called “2.1 Packet—PPT” file, to see what numbers fill in the blanks in #6-9. The presentation is designed to help with #6-9.

Proportions and Percents for Real Life

2.1

Discussion Prompts to Activate Prior Knowledge

a). Everybody measures stuff in percents. What are some things you know that are measured in percents?

b). What does the word “percent” mean?

c). How do percents work? If you get 17/20 correct on a quiz, what percent is that?

d). If you know how to get the answer for 17/20, can you explain why your method works?

Whole-Class Inquiry

1). Here’s where the word “percent” comes from:

“Per” means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

“cent” means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Percent

2). Here’s a picture of . Let’s try to answer questions a), b), and c) below.

10

20

0

5

15

a). This part represents

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b). The shaded part represents

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c). Can you draw a picture showing how many you’d get right out of 100, if you get 17 right out of every 20?

**Draw your picture above ↑**

**ANSWER: 17 out of 20 is the same rate as \_\_\_\_\_ out of \_\_\_\_\_\_. The percent is \_\_\_\_\_\_\_\_\_\_\_.**

2). The picture below shows how someone can prove that \_\_\_\_ out of \_\_\_\_\_ is the same rate as \_\_\_\_ out of \_\_\_\_\_\_.

10

0

5

In terms of percents, this shows that \_\_\_ out of \_\_\_\_ = \_\_\_\_\_\_\_.

Use a percent symbol

3). SCENARIO: In a free-throw contest, you make 4 shots out of 5. Someone asks you what your free-throw percentage was. What do you tell them? Use the grid below to draw a picture.

10

0

5

b). Second, can you draw a picture showing how many you’d make out of 100, if you make 4 out of every 5?

**Draw your picture above**

a). First, draw a picture of

 .

**Draw your picture above**

**ANSWER:** 4 out of 5 is the same rate as \_\_\_\_\_\_ out of \_\_\_\_\_\_\_.

 As fractions,

 As a percent, \_\_\_\_\_

This skill isn’t just for percents. It can help us find answers that **aren’t** out of 100, too. Here’s an example:

4). SCENARIO: You make $8/hour, and you save 3 out of every 8 dollars that you earn.

c). Since we copied the picture 9 times, the total here represents

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Number & label, please.)

b). The shaded part represents

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

(Number and label, please.)

10

0

5

a). This part represents

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

(Use a number and a label, please.)

d). Since we copied the picture 9 times, the shaded part here represents

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

(Number and label, please.)

e).Conclusion:3 out of \_\_\_\_\_ is the same rate as \_\_\_\_\_ out of \_\_\_\_\_\_.

 As fractions,

f). What was the point of this example?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Understanding Check-Up, and Speed-Building Practice

Let’s do some practice, to give the teacher a chance to see what you can do on your own. The teacher will give you the missing numbers in these problems. Then work at your own pace to answer as much as you can correctly.

5). Answer: *x =* \_\_\_\_\_

10

0

5

6). What percent is \_\_\_\_ out of \_\_\_\_\_? Answer: *x =* \_\_\_\_\_

10

20

0

5

15

7). If you finish #6 early, try the question below. The answer will be given by the teacher after #9

Michael makes 3 out of 4 free throw shots. Janet makes 8 out of 12 free throw shots. Who has the better free throw percentage?

8). About of the calories in peanut butter come from fat (that’s true). If you eat \_\_\_\_ calories’ worth of peanut butter, how many calories come from fat?

 Answer in a complete sentence: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10

0

5

Since this is a real-life question, please label the parts of your picture with what they represent, like we did in #4.

9). You and some friends buy 11 raffle tickets together and agree to split the money if one of the tickets wins. The prize is $99. You bought \_\_\_\_ of the tickets for your group.

 Since you bought \_\_ tickets, what fraction of the prize should you keep if your group wins? \_\_\_\_\_

How much money should you take home if your group wins?

 Answer in a complete sentence: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10

20

0

5

15

Please label the parts of your picture with what they represent.

Small-Group Inquiry

Now that you’ve practiced the concept, let’s see if we can do it without always drawing a picture.

a). This picture represents what fraction?

b). If you copied this picture 3 times, it would represent .

?

c). If you copied the picture 5 times, what fraction would it represent?

d). If you copied the picture 100 times, what fraction would it represent? (Please show work on this one).

e). If you copied this picture *x* times, what fraction would it represent?

2 songs you like

9 songs on album

10). SCENARIO: A new album comes out, and you like a fraction of the songs, but not all of them. Look at the picture below.

9 9 9

2 2 2

Here it is, copied 3 times.

a). This picture represents what fraction?

b). If you copied this picture 4 times, it would represent .

?

c). If you copied the picture 29 times, what fraction would it represent?

d). If you copied the picture 100 times, what fraction would it represent? (Please show work).

e). If you copied this picture *x* times, what fraction would it represent?

5 aliens

killed

7 aliens in battle

11). SCENARIO: In a video game, you killed some of the aliens in a battle, but some got away.

12). Here’s an example of thinking through a question without drawing the whole picture:

This fraction is

out of **5** .

We would have to copy

the picture **6** times.

The new picture’s shaded part would be **24**. boxes.

This fraction is

out of **30**.

Answer: x = 24

4

out of 5

**4**

**out of 5**

4

out of 5

 a). Question: In the second step, how do we know we need to copy the picture 6 times?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b). Question: In the last step, why does the new picture’s shaded part equal 24?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13). Please fill in the cartoon below.

 ? %

This fraction is

out of \_\_\_\_\_.

We would have to copy

the picture \_\_\_\_ times.

The new picture’s shaded part

would be \_\_\_\_ .

A percent is

out of \_\_\_\_\_.

20

out of 25

20

out of 25

20

out of 25

If you did #13, great job! Now you know how to solve these fast.

14). Try filling in this table:

|  |  |  |
| --- | --- | --- |
| Question | How would you solve the question? | Answer: |
|   | I’d copy the picture of . I’d copy it 9 times. Then it would be .  |  *x* = 18 |
|   | I’d copy the picture of \_\_\_ . I’d copy it \_\_\_\_ times. Then it would be \_\_\_\_.  |  |
|   | I’d copy the picture of \_\_\_ . I’d copy it \_\_\_\_ times. Then it would be \_\_\_\_.  |  |
|   | I’d copy the picture of \_\_\_ . I’d copy it \_\_\_\_ times. Then it would be \_\_\_\_.  |  |
|   | I’d copy the picture of \_\_\_ . I’d copy it \_\_\_\_ times. Then it would be \_\_\_\_.  |  |
|   | I’d copy the picture of \_\_\_ . I’d copy it \_\_\_\_ times. Then it would be \_\_\_\_.  |  |
|   | I’d copy the picture of \_\_\_ . I’d copy it \_\_\_\_ times. Then it would be \_\_\_\_.  |  |
|   | I’d copy the picture of \_\_\_ . I’d copy it \_\_\_\_ times. Then it would be \_\_\_\_.  |  |

15). Students are arguing about how to solve the question with a shortcut. Which shortcut(s) below make sense to you?

+ 10

+ 10

So *x* = 9 + 10

 *x* = 19

• 3

• 3

So *x* = 9 • 3

 *x* = 27

– 10

So *x* = 19, because

 19 – 10 = 9

– 10

÷ 3

So *x* = 27, because

 27 ÷ 3 = 9

÷ 3

**Don’t skip these ↑ answers.**

(Please write your response on the next page).

Could all the shortcuts be correct? Why or why not?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Which shortcut(s) make sense to you, and why?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What seemed wrong about the shortcut(s) that **didn’t** make sense to you?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_