How Do You Make a Mural?

A mural is a big picture—it usually covers a whole wall. Here is an example:

1). Where is there a mural in your neighborhood?

How do you make a mural? If it’s very simple, you might just draw it free-style. But if it’s complicated, you have to plan it out and measure things carefully.

Usually, you draw a small picture first, and then **enlarge it.**

Source:(<http://commons.wikimedia.org/wiki/File:Derry_mural_6.jpg>;

Your goal in this activity is to figure out how to enlarge a picture without changing the way it looks.

Below is the picture you’ll be enlarging. Please measure the rectangles and squares that the dog is made of:

Tail:

Height: \_\_\_\_\_

Width: \_\_\_\_\_\_

Body:

Height: \_\_\_\_\_

Width: \_\_\_\_\_\_

Head:

Height: 3 units

Width: \_\_\_\_\_\_

Nose:

Height: \_\_\_\_\_

Width: \_\_\_\_\_\_

**Example:**

Legs:

Height: \_\_\_\_\_

Width: \_\_\_\_\_

2).The question is, how do you enlarge this picture of the dog without changing its shape? You need to do something to the measurements to make them bigger. What operations could you use to make the measurements *bigger*?

Addition Subtraction Multiplication Division (circle the correct choices)

I hope you said “addition” and “multiplication”. (Technically, you could subtract if you subtracted a negative number, but let’s not get into that now).

3). To enlarge the dog, should we ADD something to all the measurements? Or MULTIPLY something by all the measurements? What do you think?

To check your theory, let’s do both and see which one makes the dog look right. We’ll add 3 to all the measurements, and multiply 3 by all the measurements. Please fill out the table below:

4).

|  |  |  |  |
| --- | --- | --- | --- |
| **Part of Dog** | **Original Measurements** (from last page) | **ADD 3** to the original measurements | **MULTIPLY** the original measurements **by 3** |
| **Head** | Height: 3 units  Width: | Height: 3+3 = **6 units**  Width: | Height: (3)(3) = **9 units**  Width: |
| **Body** | Height:  Width: | Height:  Width: | Height:  Width: |
| **Tail** | Height:  Width: | Height:  Width: | Height:  Width: |
| **Legs** | Height:  Width: | Height:  Width: | Height:  Width: |
| **Nose** | Height:  Width: | Height:  Width: | Height:  Width: |

If your teacher is available, it’s a good idea to check your answers to #4 before you keep going.

Next, your group is going to draw the dog with the new measurements.

**Enlarging by Adding 3 to Each Dimension**

5). Instructions: Draw the dog using the measurements where 3 has been added. The body has already been drawn. Its measurements are \_\_\_\_ by \_\_\_\_.

**Conclusions for Adding 3:**

6). How does your dog look now? Please be specific—what parts look right or wrong?

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7). Was adding 3 to all the measurements a good or bad way of enlarging the picture?

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**Enlarging by Multiplying 3 by Each Dimension**

8). Instructions: Draw the dog using the measurements that have been multiplied by 3. The body has already been drawn. Its measurements are \_\_\_\_ by \_\_\_\_. (You need to turn the paper sideways).

**Conclusions for Multiplying by 3:**

9). How does your dog look now? Please be specific—what parts look right or wrong?

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10). Was multiplying each measurement by 3 a good or bad way of enlarging the picture?

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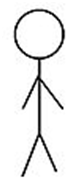
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Vocabulary Moment The terms “ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” and “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” describe a shape whose parts are all the correct size in comparison to each other.

11). Use one of those terms in a complete sentence to describe this picture of George Washington.

Practice and extend

12). Bryan wants to climb the palm tree to get the coconuts, but it looks very tall. He can measure the shadows, since they’re on the ground. Based on the shadows shown, how tall is the tree?



6 ft.

8 ft.

32 ft.

*x*

13). At the movies, 3 tickets cost $36.48. How much would 21 tickets cost?

Check-in: what have we learned so far?

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

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Practice and extend

14). Some pizzas are $20 without delivery, and $24 with delivery. If a larger order of pizzas is $40 without delivery, how much would it be with delivery?

15). Mr. Hall is not great at shooting free-throws. Out of 6 shots, he makes 4. Based on that, how many would he probably make out of 18 shots?

**Conclusion:** What’s the difference between pictures for when you can compare by multiplying works and the pictures when you can’t?

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16). When you get a large frozen yogurt from Pinkberry with 2 servings of coconut topping, you get a total of 380.6 calories. If you got 4 servings of coconut instead, how many calories would that have?

Source: <http://www.pinkberry.com/images/pdf/Nutrition.pdf> accessed 4/28/12

**Jose’s work**

|  |  |
| --- | --- |
| 2 servings coconut | 4 servings coconut |
| 380.6 calories | ?? |

× 2

× 2

(380.6)(2) =

761.2 calories

**Complete the picture. Then use it to explain whether you agree with Jose or not.**

380.6

2

Servings of coconut

Total calories

Servings of coconut

Total calories

Do you agree with Jose?

Small-group Practice:

For #17-21, explain in a complete sentence whether you agree or disagree with the work shown. Be sure to give your reasons.

17). A baby weighs 9.4 lbs on the second day after it was born. How much will it weigh on the sixth day?

|  |  |
| --- | --- |
| 2 days old | 6 days old |
| 9.4 lbs | ?? |

× 3

× 3

**Zack’s work:**

**Question**: Do you agree or disagree with Zack’s decision to compare by multiplying? Why?

18). When you work 5 hours, you get paid $45. When you work 40 hours, how much do you get paid?

|  |  |
| --- | --- |
| 5 hrs worked | 40 hrs worked |
| $45 | ?? |

× 8

× 8

**David's work:**

**Question:** Do you agree or disagree with David’s decision to compare by multiplying? Why?

19). You pay 22% taxes. How much tax would you pay if you earned $400?

(Remember, 22% means 22 out of \_\_\_\_\_).

100

22

Taxes paid

Dollars earned

Taxes paid

Dollars earned

100

22

100

22

100

22

100

22

So your taxes would be (22)(4) =

**Milena’s work**

$88

**Question:** Does Milena’s picture make sense? Why or why not? Do you agree with her answer?

20). The Miami Heat basketball team has a score of 58 points when it’s 3 minutes after halftime. What will be their score when it’s 6 minutes after halftime?

|  |  |
| --- | --- |
| 3 minutes | 6 minutes |
| 58 score | ?? (score) |

× 2

× 2

**Diana’s work:**

So their score will be (58)(2) =

116 pts.

**Question:** The answer is too high. Why doesn’t comparing by multiplying work? Be as specific as possible.

What does this have to do with fractions?

Vocabulary moment:

* A \_\_\_\_\_\_\_\_\_\_\_\_ is a comparison of 2 numbers using division.

Examples:

* A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an equation that says 2 ratios are equal.

Examples:

21). Use your calculator to check whether these proportions are correct. Write “Correct” or “Incorrect.”

a). b). , with c).

small-group practice:

Set up and solve each problem with a proportion. Write each answer in a complete sentence. If you don’t think a situation would be proportional, just write “not proportional,” and skip the problem.

22). Trayon took 25 total shots, and made 18 of them. How many would he make out of 100?

Answer in a complete sentence: “He would make \_\_\_\_\_ shots out of 100”

23). You are skateboarding down a hill (without pushing with your legs). After 2 seconds, you have gone 11feet. How far will you have gone after 8 seconds?

24). You figure out that you like about 4 out of every 9 songs that you hear on your 97.1 FM. At that rate, if you hear 54 songs, how many will you like?

25). You turn off the oven to cool it down. About 4 minutes later, it’s 300oF. How hot will it be 8 minutes after you turned it off?

26). About of the calories in peanut butter come from fat (that’s true). If you eat 128 calories’ worth of peanut butter, how many calories come from fat?

27). Students are arguing about how to solve the proportion . Which methods are incorrect, and why?

+ 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

Method A

Method B

Method C

Method D

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