Unit 2, Lesson 5

Creating Double Number Line Diagrams

Let's draw double number line diagrams like a pro.

5.1 Ordering on a Number Line

Locate and label each number on the number line:

$\frac{1}{2}$ $\frac{1}{4}$ $1\frac{3}{4}$ 1.5 1.75

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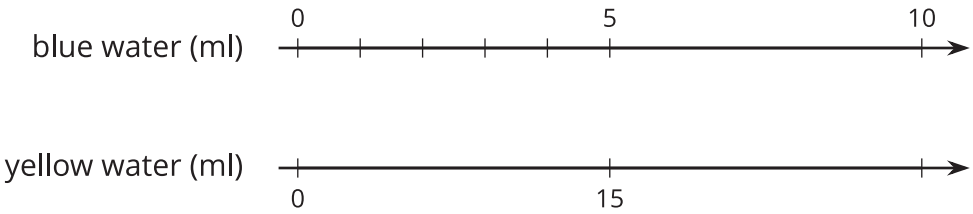
5.2 Just a Little Green

The other day, we mixed 5 ml of blue water with 15 ml of yellow water to make green water. Now we want to make a very small batch of the same shade of green water.



1. On the number line for blue water, label the four tick marks shown.
2. On the number line for yellow water, draw and label tick marks to show the amount of yellow water needed for each amount of blue water.
3. How much yellow water should be used for 1 ml of blue water? Circle where you can see this on the double number line.
4. How much yellow water should be used for 11 ml of blue water?
5. How much yellow water should be used for 8 ml of blue water?
6. Why is it useful to know how much yellow water should be used with 1 ml of blue water?

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5.3 Play Clay on a Double Number Line

A recipe for play clay says, “For every 2 pints of liquid glue, mix in 8 cups of corn flour.”

1. Follow the instructions to draw a double number line diagram that represents the recipe for play clay.
   a. Use a ruler to draw two parallel lines.
   b. Label the first line “pints of glue.” Label the second line “cups of corn flour.”
   c. Draw at least 6 equally spaced tick marks that line up on both lines.
   d. Along the glue line, label the tick marks with the amount of glue in 0, 1, 2, 3, 4, and 5 batches of play clay.
   e. Along the corn-flour line, label the tick marks with the amount of corn flour in 0, 1, 2, 3, 4, and 5 batches of play clay.

2. Compare your double number line diagram with your partner’s. Discuss your thinking. If needed, revise your diagram.

3. Next, use your double number line to answer these questions:
   a. How much corn flour should be used with 10 pints of glue?
   b. How much glue should be used with 24 cups of corn flour?
   c. How much corn flour **per** pint of glue does this recipe use?

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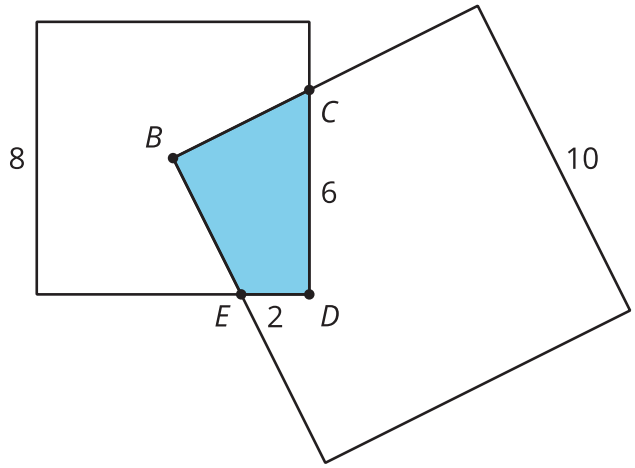
Are you ready for more?

A square with side of 10 units overlaps a square with side of 8 units in such a way that its corner, Point B, is placed exactly at the center of the smaller square. As a result of the overlapping, the two sides of the large square intersect the two sides of the small square exactly at Points C and E, as shown. The length of CD is 6 units.



What is the area of the overlapping region $CDEB$?

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5.4 Revisiting Radish Cake

A recipe for radish cake calls for 20 ounces of radish for every 6 ounces of rice flour.

1. Draw a double number line diagram that represents the amounts of radish and rice flour in different-size batches of this recipe.

2. If you made a large amount of radish cake by mixing 80 ounces of radish with 30 ounces of rice flour, would it taste the same as the original recipe? Explain or show your reasoning.

3. The original recipe calls for 3 tablespoons of chopped green onions for every 6 ounces of rice flour.

   Add a line to your diagram to represent the amount of green onions in different batches of radish cake.

4. How many tablespoons of green onions should you mix with 60 ounces of radish to make a radish cake that tastes the same as the original recipe?

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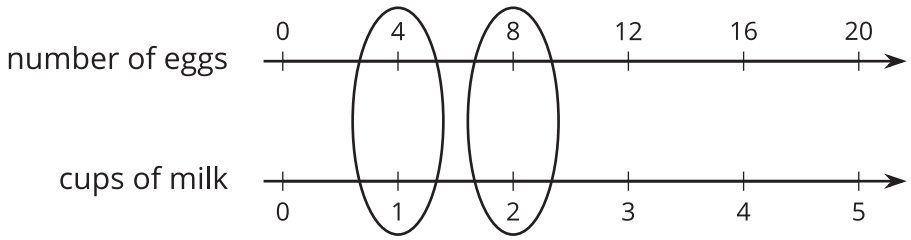
Lesson 5 Summary

Here are some guidelines to keep in mind when drawing a double number line diagram:

- The two parallel lines should have labels that describe what the numbers represent.
- The tick marks and numbers should be spaced at equal intervals.
- Numbers that line up vertically make equivalent ratios.

For example, the ratio of the number of eggs to cups of milk in a recipe is $4 : 1$. Here is a double number line that represents the situation:



We can also say that this recipe uses "4 eggs per cup of milk" because the word **per** means "for each."

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