Homework 6

Read: pp. 26-30 from the Lobato and Ellis (2010) book. One interpretation of a ratio as a fraction is shown in Figures 1.19 and 1.20 and is explained on pages 27-28. This one uses multiplicative comparison reasoning. The second interpretation of the same ratio as a fraction is shown in Figures 1.21 and 1.22 and is explained on page 28. This second interpretation uses composed unit reasoning.

Optional Reading: This is our last lesson in this unit on proportional reasoning. If you are interested in reading more, I suggest pp. 36- 41 of the Lobato and Ellis book (Essential Understanding 7) to see examples of more sophisticated composed unit reasoning and one way to relate composed unit reasoning with multiplicative comparison reasoning.

Answer these questions in writing

1. A shade of orange paint is made by combining 3 ounces red paint with 5 ounces yellow paint. The ratio of red to yellow can be written as 3:5 or $\frac{3}{5}$

    A. Interpret the ratio (3 to 5) as a fraction (as **three-fifths** of something). **Draw** a picture and provide an **explanation** that you think would be effective with middle school students. You can use ideas from the Lobato and Ellis reading and/or from Lesson 6 of our class.

    B. Provide a **second, different interpretation** and **drawing** of the ratio as the fraction **three-fifths**, again in a way that would be effective with middle school students.

Note: One interpretation should correspond to forming the ratio as a multiplicative comparison and the other interpretation should come from thinking of the ratio as a composed unit.

2. The currency used in New Zealand is called New Zealand Dollars. Every 2 US dollars can be exchanged for 3 New Zealand dollars. That is, the ratio of US dollars to New Zealand dollars is 2:3 or $\frac{2}{3}$. You do **NOT** need to include drawings (though you can if you would like).

1

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A. Interpret this ratio as a fraction (meaning as **two-thirds** of something). Explain this interpretation in a way that you think would be helpful to a middle school student.

B. Provide a second, different interpretation of the ratio as the fraction **two-thirds,** again in a way that would be meaningful to a middle school student.

3. An M1 Abrams tank travels on average only 6 miles for every 10 gallons of fuel. Interpret the ratio of miles to gallons (6:10) as the fraction **six-tenths** in **TWO** different ways. You do **NOT** need to include drawings or explanations (though you can if you would like); just state the two different interpretations.