Homework Help
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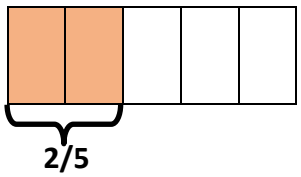
Grades 4-6: The Rectangular Fraction Model

The rectangular fraction model means a rectangle divided into equal parts. The equal parts may be halves, thirds, fourths, and so on, depending on how many equal parts you chop the whole into.

Remember that in any fraction, the number on the top is the numerator, and the number on the bottom is the denominator. The numerator in ⅗ is 2, and the denominator is 5.

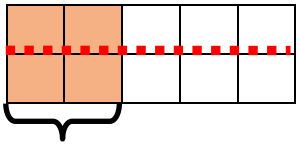
Let's use a rectangular fraction model to represent **2/5**.



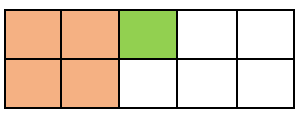
- 5, the **number on the bottom, is the denominator**, and 2, **the number on top, is the numerator**.
- The **denominator tells us how many parts** we need to divide our rectangle into. Here, we have **5** equal parts, or fifths. **Each piece represents 1/5**, because it is **one out of five** total.
- The **numerator tells us how many parts should be shaded or colored** in. Here, because **the numerator is 2, two out of five** are shaded.
- We shade in 2 pieces out of 5 to represent 2/5.

We can use the **rectangular fraction model** to help solve many kinds of problems involving fractions, for example, if we need to **add two fractions that have different (unlike) denominators** such as: **2/5 + 1/10**

- We have already drawn the rectangle that represents 2/5, but now we **need to add 1/10**. How can we do that?
- We need to find a **common denominator** to add fractions. We **can't just add fifths and tenths** in one step.
- One way to make the denominators match is to **change our fifths into tenths**. We need to double the number of pieces so that we have **10 instead of 5**. We can do that by **drawing a line horizontally across our original rectangle**.



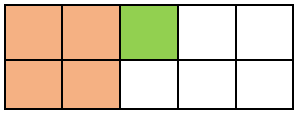
- The **shaded part is <u>the same size as it was above</u>**, but now, our rectangle has **ten boxes** inside of it. **4 of the 10 total boxes, or 4/10, are shaded.** This shows that **2/5 is the exact same amount as 4/10**! They are **equivalent fractions**.
- The next step is to **add 1/10**. We can show that by **shading one more** of the ten total boxes. Let's do that in green.
- The final step is to count up **how many total boxes are shaded** in either **orange** or **green**. **5 out of 10** are shaded, so our answer is **5/10**!



- *(For information on simplifying this answer, go to Page 2!)*

Rectangular Fraction Model: Simplifying

Remember that we found an answer to our example problem on Page 1: **2/5 + 1/10 = 5/10**



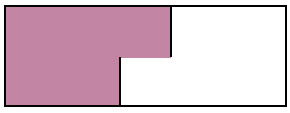
- Our answer is right, but now let's **simplify**. To **simplify a fraction means to find an equivalent fraction where 1 is the only common factor of the numerator (top number) and denominator (bottom number).** In other words, once we simplify, we can't divide the top and bottom numbers by anything bigger than 1.
- To simplify without using a visual, we **divide the numerator and denominator by their greatest common factor (GCF)**.
- In other words, we **divide both by the biggest number that goes into each**. In our example, 5/10, we need to find the biggest number we can divide both 5 and 10 by. In this example, the GCF is 5.

5 ÷ 5 = 1

10 ÷ 5 = 2

- By simplifying our answer, we found out that **5/10 and 1/2 are equivalent**. Because we **can't divide both 1 and 2 (the new numerator and denominator) by any number bigger than 1**, we have found our **simplified answer: 1/2.**

- **The rectangle** that we shaded in to show 5/10 **can also help us simplify**. If you look closely at the rectangle, you may notice that **the shaded-in part and the non-shaded part are exactly the same size**.



- The **purple shaded part makes up 1/2 of the whole**, and the non-shaded part makes up 1/2 of the whole.
- How much of the whole is shaded? 1/2! In other words, the **rectangle helps show that 5/10 is equivalent to 1/2.**

For More on This Topic: https://hvparent.com/common-core-math-part-four