Fractions Bite – How Come All These Fractions Look Different But Equal the Same Thing?

If you watched the previous video in this series, you saw that

$$\frac{1}{2} = \frac{4}{8}$$

and it would be reasonable to ask why fractions are so weird.

The answer is twofold:

1) Fractions are definitely weird, but also

2) Fractions aren't the only numbers that do this

For example, consider that

$$2 \cdot 3 = 6$$

$2 \cdot 3$ and 6 are equal, even though they look different, and $2 \cdot 3$ and 6 are each useful in different situations. So how do we decide which answer to use? In this case, you'd need more context. Let's look at a couple problems:

1) Evaluate $2 \cdot 3$

When you're asked to evaluate, that means to use the given operation(s) to come up with a sum, difference, quotient or, in this case, product. The answer would be 6.

$2 \cdot 3 = \boxed{6}$

2) Express 6 as a product of two prime numbers

In this case the answer would be $6 = 2 \cdot 3$

$6 = \boxed{2 \cdot 3}$

The rule for fractions is:

Always reduce, unless you are asked not to.

Let's look at a couple of problems:

1) Reduce $\frac{6}{20}$

$$\boxed{\frac{6}{20} = \frac{\cancel{2}^{1} \cdot 3}{\cancel{2}_{1} \cdot 10} = \frac{3}{10}}$$

In this case, you are explicitly asked to reduce the fraction:

$$\frac{6}{20} = \frac{3}{10}$$ so the answer would be $\boxed{\frac{3}{10}}$

2) Multiply $\frac{1}{4} \cdot \frac{6}{5}$

(We will review multiplication of fractions in a future video, but the basic rule is to multiply across the top and the bottom separately)

$$\frac{1}{4} \cdot \frac{6}{5} = \frac{1 \cdot 6}{4 \cdot 5} = \frac{6}{20} = \frac{\cancel{2}^{1} \cdot 3}{\cancel{2}_{1} \cdot 10} = \boxed{\frac{3}{10}}$$

3) Solve this equation: $\frac{3}{10} = \frac{?}{20}$

$$\frac{3 \cdot 2}{10 \cdot 2} = \frac{?}{20} = \boxed{\frac{6}{20}} \text{ or } \boxed{6}$$