Resource **Equivalent Fractions**

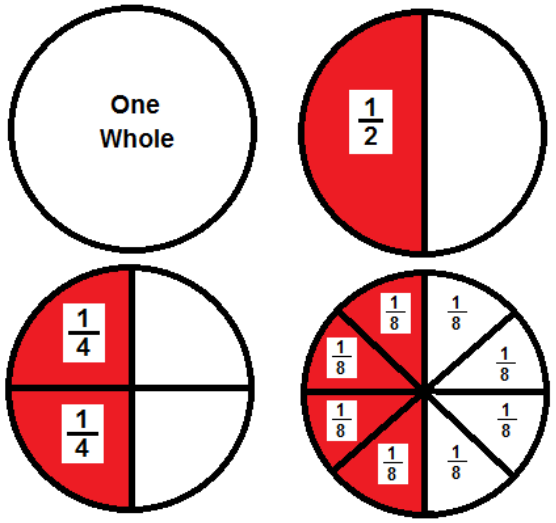
Quantitative reasoning skill: Equivalent fractions

Two fractions are equivalent if they have the same value or represent the same part of an object.

For example, the figure shows that $1/2$, $2/4$, and $4/8$ all represent the same part of a whole. They are equivalent fractions.

Recall that the denominator of a fraction represents the number of parts into which the whole has been divided. The numerator represents a count of the number of parts.

So, $\frac{4}{8}$ means that the whole is divided into 8 equal parts, and 4 of these parts are counted.



The same part of an object: $1/2 = 2/4 = 4/8$

Quantitative reasoning skill: Simplifying fractions

The fraction 50/100 is equivalent to 1/2. Note that you can write:

$$\frac{50}{100} = \frac{1 \cdot 50}{2 \cdot 50} = \frac{1}{2} \cdot 1$$

The above calculation shows that both 50 and 100 can be written as a number times 50. You say that 50 and 100 have a "common factor of 50."

Another way to think of this is that the number 1 (written as $\frac{50}{50}$) is embedded in the fraction $\frac{50}{100}$.

"1" is a special number in mathematics because if you multiply any number by 1, you get a result that is equivalent to the original.

By dividing $\frac{50}{50}$ to get 1, you simplify $\frac{50}{100}$ to $\frac{1}{2}$.

In this case, **simplify** means that the fraction has been written in an equivalent form with smaller numbers. The *simplest* form means that the fraction is written using the smallest possible numbers. In general, answers should always be given in simplest form unless the question specifically calls for a different form.

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Caution: It is common to say that you are writing the fraction in “reduced form.” This language is misleading—the value of the simpler fraction is the same as the original fraction, but the word *reduced* implies that the “reduced fraction” represents a smaller quantity. The terminology *simplest form* or *lowest terms* is more appropriate.

The Khan Academy website has free videos and practice problem sets that you can use for additional review:

- https://www.khanacademy.org/video/equivalent-fractions?playlist=Arithmetic

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