***Equivalent Fractions****have the same value, even though they may look different.*

These fractions are really the same:

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

**Why are they the same?** Because when you multiply or divide **both** the top and bottom by the same number, the fraction keeps its value.

Here is why those fractions are really the same:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|   | **× 2** |   | **× 2** |   |
| right over arrow   right over arrow |
| 1 |  =  | 2 |  =  | 4 |
| 2 | 4 | 8 |
| right under arrow   right under arrow |
|   | **× 2** |   | **× 2** |   |

And visually it looks like this:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1/2 |   | 2/4 |   | 4/8 |
| pie 1/2 | = | pie 2/4 | = | pie 4/8 |

**Dividing**

Here are some more equivalent fractions, this time by dividing:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|   | ÷ 3 |   | ÷ 6 |   |
| right over arrow   right over arrow |
| 18 |  =  | 6 |  =  | 1 |
| 36 | 12 | 2 |
| right under arrow   right under arrow |
|   | ÷ 3 |   | ÷ 6 |   |

Choose the number you divide by carefully, so that the results (both top and bottom) stay **whole numbers NOT decimals**.

If we keep dividing until we can't go any further, then we have **simplified** the fraction (made it as simple as possible).

**Summary:**

* You can make equivalent fractions by multiplying or dividing **both top and bottom** by the same amount.
* You only multiply or divide, **never add or subtract**, to get an equivalent fraction.
* Only divide when the top and bottom stay as **whole numbers NOT decimals**.

Source:

<https://www.mathsisfun.com/equivalent_fractions.html>