|  |  |  |
| --- | --- | --- |
| **Equivalent Fractions**  **STUDY GUIDE** | http://www.mathgoodies.com/lessons/fractions/rectangles/rectangle_three_fourths_blue_nonroutine.gif |  |

What do the fractions in example 1 have in common?

|  |  |
| --- | --- |
| **Example 1** | |
| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | http://www.mathgoodies.com/lessons/fractions/circles/circle_one_half_red.gif | http://www.mathgoodies.com/lessons/fractions/images/tab.gif | http://www.mathgoodies.com/lessons/fractions/circles/circle_two_fourths_blue_eq.gif | http://www.mathgoodies.com/lessons/fractions/images/tab.gif | http://www.mathgoodies.com/lessons/fractions/circles/circle_three_sixths_yellow.gif | http://www.mathgoodies.com/lessons/fractions/images/tab.gif | http://www.mathgoodies.com/lessons/fractions/circles/circle_four_eighths_orange_eq.gif | | http://www.mathgoodies.com/lessons/fractions/halves/1over2.gif | http://www.mathgoodies.com/lessons/fractions/fourths/2over4.gif | http://www.mathgoodies.com/lessons/fractions/sixths/3over6.gif | http://www.mathgoodies.com/lessons/fractions/eighths/4over8.gif | |  |

Each fraction in example 1 represents the same number. These fractions are *equivalent*.

|  |  |
| --- | --- |
| **Definition:** | **Equivalent fractions** are different fractions that name the same number. |

http://www.mathgoodies.com/lessons/fractions/images/eqiv_example1.gif

Let's look at some more examples of equivalent fractions.

|  |
| --- |
| **Example 2** |
| |  |  | | --- | --- | | http://www.mathgoodies.com/lessons/fractions/rectangles/rectangle_two_thirds_small_pink.gif | http://www.mathgoodies.com/lessons/fractions/thirds/2over3.gif | | http://www.mathgoodies.com/lessons/fractions/rectangles/rectangle_four_sixths_yellow.gif | http://www.mathgoodies.com/lessons/fractions/sixths/4over6.gif | |
| http://www.mathgoodies.com/lessons/fractions/images/eq_example2a.gif |
| Two-thirds is equivalent to four-sixths. |

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| **Example 3** |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | http://www.mathgoodies.com/lessons/fractions/circles/circle_three_fourths_blue_eq.gif | http://www.mathgoodies.com/lessons/fractions/images/tab.gif | http://www.mathgoodies.com/lessons/fractions/circles/circle_six_eighths_orange_eq.gif | http://www.mathgoodies.com/lessons/fractions/images/tab.gif | http://www.mathgoodies.com/lessons/fractions/circles/circle_nine_twelfths_lavendar.gif | | http://www.mathgoodies.com/lessons/fractions/fourths/3over4.gif |  | http://www.mathgoodies.com/lessons/fractions/eighths/6over8.gif |  | http://www.mathgoodies.com/lessons/fractions/twelfths/9over12.gif | |
| http://www.mathgoodies.com/lessons/fractions/images/eq_example3c.gif |
| The fractions three-fourths, six-eighths, and nine-twelfths are equivalent. |

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|  |

Finding Equivalent Fractions

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

These fractions are really the same:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  | | --- | | 1 | |  | | 2 | | = | |  | | --- | | 2 | |  | | 4 | | = | |  | | --- | | 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 it's value.

The rule to remember is:

*"Change the bottom using multiply or divide,  
And the same to the top must be applied"*

So, here is why those fractions are really the same:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **× 2** |  | **× 2** |  |
| http://www.mathsisfun.com/images/left-up-over-arrow.gif   http://www.mathsisfun.com/images/left-up-over-arrow.gif | | | | |
| 1 | = | 2 | = | 4 |
|  |  |  |
| 2 | 4 | 8 |
| http://www.mathsisfun.com/images/left-under-over-arrow.gif   http://www.mathsisfun.com/images/left-under-over-arrow.gif | | | | |
|  | **× 2** |  | **× 2** |  |

And visually it looks like this:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1/2** |  | **2/4** |  | **4/8** |
| http://www.mathsisfun.com/images/fractions/pie-1-2.jpg | = | http://www.mathsisfun.com/images/fractions/pie-2-4.jpg | = | http://www.mathsisfun.com/images/fractions/pie-4-8.jpg |