**Convert Decimals to Fractions**

*(Multiply top and bottom by 10 until you get a whole number, then simplify)*

**To convert a Decimal to a Fraction follow these steps:**

|  |
| --- |
| **Step 1:** Write down the decimal divided by 1, like this: decimal/1 |
| **Step 2:** Multiply both top and bottom by 10 for every number after the decimal point. (For example, if there are two numbers after the decimal point, then use 100, if there are three then use 1000, etc.) |
| **Step 3:** [Simplify](http://www.mathsisfun.com/simplifying-fractions.html) (or reduce) the fraction |

**Example: Express 0.75 as a fraction**

**Step 1:** Write down 0.75 divided by 1:

|  |
| --- |
| 0.75 |
|  |
| 1 |

**Step 2:** Multiply both top and bottom by **100** (there were 2 digits after the decimal point so that is 10×10=100):

|  |  |  |
| --- | --- | --- |
| × 100 | | |
| http://www.mathsisfun.com/images/left-up-over-arrow.gif | | |
| 0.75 | = | 75 |
|  |  |
| 1 | 100 |
| http://www.mathsisfun.com/images/left-under-over-arrow.gif | | |
| × 100 | | |

*(Do you see how it turns the top number   
into a whole number?)*

**Step 3:** [Simplify the fraction](http://www.mathsisfun.com/simplifying-fractions.html) (this took me two steps):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ÷5 |  | ÷ 5 |  |
| http://www.mathsisfun.com/images/left-up-over-arrow.gif  http://www.mathsisfun.com/images/left-up-over-arrow.gif | | | | |
| 75 | = | 15 | = | 3 |
|  |  |  |
| 100 | 20 | 4 |
| http://www.mathsisfun.com/images/left-under-over-arrow.gif  http://www.mathsisfun.com/images/left-under-over-arrow.gif | | | | |
|  | ÷5 |  | ÷ 5 |  |

**Answer = 3/4**

*Note: 75/100 is called a* ***decimal fraction*** *and 3/4 is called a* ***common fraction*** *!*

**Example: Express 0.625 as a fraction**

**Step 1:** write down:

|  |
| --- |
| 0.625 |
|  |
| 1 |

**Step 2:** multiply both top and bottom by **1,000** (there were 3 digits after the decimal point so that is 10×10×10=1,000)

|  |
| --- |
| 625 |
|  |
| 1,000 |

**Step 3:** Simplify the fraction (it took me two steps here):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ÷ 25 |  | ÷ 5 |  |
| http://www.mathsisfun.com/images/left-up-over-arrow.gif  http://www.mathsisfun.com/images/left-up-over-arrow.gif | | | | |
| 625 | = | 25 | = | 5 |
|  |  |  |
| 1,000 | 40 | 8 |
| http://www.mathsisfun.com/images/left-under-over-arrow.gif  http://www.mathsisfun.com/images/left-under-over-arrow.gif | | | | |
|  | ÷ 25 |  | ÷ 5 |  |

**Answer = 5/8**

**Example: Express 0.333 as a fraction**

**Step 1:** Write down:

|  |
| --- |
| 0.333 |
|  |
| 1 |

**Step 2:** Multiply both top and bottom by **1,000** (there were 3 digits after the decimal point so that is 10×10×10=1,000)

|  |
| --- |
| 333 |
|  |
| 1,000 |

**Step 3:** Simplify Fraction:

Can't get any simpler!

**Answer = 333/1,000**

**But a Special Note:**

If you really meant 0.333... (in other words 3s repeating forever which is called *3 recurring*) then we need to follow a special argument. In this case we would write down:

|  |
| --- |
| 0.333... |
|  |
| 1 |

Then MULTIPLY both top and bottom by 3:

|  |  |  |
| --- | --- | --- |
| × 3 | | |
| http://www.mathsisfun.com/images/left-up-over-arrow.gif | | |
| 0.333... | = | 0.999... |
|  |  |
| 1 | 3 |
| http://www.mathsisfun.com/images/left-under-over-arrow.gif | | |
| × 3 | | |

And **0.999... = 1** (Does it? - see the [9 Recurring](http://www.mathsisfun.com/9recurring.html) discussion for more if you are interested), so:

Answer = 1/3