

EQUIVALENT FRACTIONS

What Are Equivalent Fractions?

- Equivalent fractions represent the same ratio between two values.
- Fractions show a ratio between two values. The fraction $\frac{1}{2}$ represents 1 out of 2. If there were 2 students sharing an assignment, each would do part of the work. The work would be divided into 2 equal parts and each student would do 1 part or $\frac{1}{2}$ the total project.
- The fraction $\frac{1}{2}$ also represents part of a set. If there are 2 cookies in a set and one is eaten, then 1 out of 2 cookies is eaten. The relationship between the cookie eaten and the total number of cookies is 1 out of 2 or $\frac{1}{2}$.
- Because sets come in a variety of sizes, fractional parts will have a variety of equivalent fractions. For example, $\frac{1}{2}$ is the same as $\frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$, $\frac{5}{10}$, $\frac{6}{12}$, $\frac{7}{14}$, $\frac{8}{16}$, $\frac{9}{18}$, $\frac{10}{20}$, $\frac{11}{22}$, $\frac{12}{24}$, $\frac{13}{26}$, $\frac{14}{28}$, $\frac{15}{30}$, $\frac{16}{32}$, $\frac{17}{34}$, $\frac{18}{36}$, $\frac{19}{38}$, $\frac{20}{40}$, $\frac{21}{42}$, $\frac{22}{44}$, $\frac{23}{46}$, $\frac{24}{48}$, $\frac{25}{50}$, $\frac{26}{52}$, $\frac{27}{54}$, $\frac{28}{56}$, $\frac{29}{58}$, $\frac{30}{60}$, $\frac{31}{62}$, $\frac{32}{64}$, $\frac{33}{66}$, $\frac{34}{68}$, $\frac{35}{70}$, $\frac{36}{72}$, $\frac{37}{74}$, $\frac{38}{76}$, $\frac{39}{78}$, $\frac{40}{80}$, $\frac{41}{82}$, $\frac{42}{84}$, $\frac{43}{86}$, $\frac{44}{88}$, $\frac{45}{90}$, $\frac{46}{92}$, $\frac{47}{94}$, $\frac{48}{96}$, $\frac{49}{98}$, $\frac{50}{100}$, $\frac{51}{102}$, $\frac{52}{104}$, $\frac{53}{106}$, $\frac{54}{108}$, $\frac{55}{110}$, $\frac{56}{112}$, $\frac{57}{114}$, $\frac{58}{116}$, $\frac{59}{118}$, $\frac{60}{120}$, $\frac{61}{122}$, $\frac{62}{124}$, $\frac{63}{126}$, $\frac{64}{128}$, $\frac{65}{130}$, $\frac{66}{132}$, $\frac{67}{134}$, $\frac{68}{136}$, $\frac{69}{138}$, $\frac{70}{140}$, $\frac{71}{142}$, $\frac{72}{144}$, $\frac{73}{146}$, $\frac{74}{148}$, $\frac{75}{150}$, $\frac{76}{152}$, $\frac{77}{154}$, $\frac{78}{156}$, $\frac{79}{158}$, $\frac{80}{160}$, $\frac{81}{162}$, $\frac{82}{164}$, $\frac{83}{166}$, $\frac{84}{168}$, $\frac{85}{170}$, $\frac{86}{172}$, $\frac{87}{174}$, $\frac{88}{176}$, $\frac{89}{178}$, $\frac{90}{180}$, $\frac{91}{182}$, $\frac{92}{184}$, $\frac{93}{186}$, $\frac{94}{188}$, $\frac{95}{190}$, $\frac{96}{192}$, $\frac{97}{194}$, $\frac{98}{196}$, $\frac{99}{198}$, $\frac{100}{200}$.

1	2	3
2	4	6



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50	100
100	200

- The ratio of the numerator to the denominator of a fraction is the same as the ratio of the numerator to the denominator of an equivalent fraction. For example, $\frac{1}{2}$ is equivalent to $\frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$, $\frac{5}{10}$, $\frac{6}{12}$, $\frac{7}{14}$, $\frac{8}{16}$, $\frac{9}{18}$, $\frac{10}{20}$, $\frac{11}{22}$, $\frac{12}{24}$, $\frac{13}{26}$, $\frac{14}{28}$, $\frac{15}{30}$, $\frac{16}{32}$, $\frac{17}{34}$, $\frac{18}{36}$, $\frac{19}{38}$, $\frac{20}{40}$, $\frac{21}{42}$, $\frac{22}{44}$, $\frac{23}{46}$, $\frac{24}{48}$, $\frac{25}{50}$, $\frac{26}{52}$, $\frac{27}{54}$, $\frac{28}{56}$, $\frac{29}{58}$, $\frac{30}{60}$, $\frac{31}{62}$, $\frac{32}{64}$, $\frac{33}{66}$, $\frac{34}{68}$, $\frac{35}{70}$, $\frac{36}{72}$, $\frac{37}{74}$, $\frac{38}{76}$, $\frac{39}{78}$, $\frac{40}{80}$, $\frac{41}{82}$, $\frac{42}{84}$, $\frac{43}{86}$, $\frac{44}{88}$, $\frac{45}{90}$, $\frac{46}{92}$, $\frac{47}{94}$, $\frac{48}{96}$, $\frac{49}{98}$, $\frac{50}{100}$, $\frac{51}{102}$, $\frac{52}{104}$, $\frac{53}{106}$, $\frac{54}{108}$, $\frac{55}{110}$, $\frac{56}{112}$, $\frac{57}{114}$, $\frac{58}{116}$, $\frac{59}{118}$, $\frac{60}{120}$, $\frac{61}{122}$, $\frac{62}{124}$, $\frac{63}{126}$, $\frac{64}{128}$, $\frac{65}{130}$, $\frac{66}{132}$, $\frac{67}{134}$, $\frac{68}{136}$, $\frac{69}{138}$, $\frac{70}{140}$, $\frac{71}{142}$, $\frac{72}{144}$, $\frac{73}{146}$, $\frac{74}{148}$, $\frac{75}{150}$, $\frac{76}{152}$, $\frac{77}{154}$, $\frac{78}{156}$, $\frac{79}{158}$, $\frac{80}{160}$, $\frac{81}{162}$, $\frac{82}{164}$, $\frac{83}{166}$, $\frac{84}{168}$, $\frac{85}{170}$, $\frac{86}{172}$, $\frac{87}{174}$, $\frac{88}{176}$, $\frac{89}{178}$, $\frac{90}{180}$, $\frac{91}{182}$, $\frac{92}{184}$, $\frac{93}{186}$, $\frac{94}{188}$, $\frac{95}{190}$, $\frac{96}{192}$, $\frac{97}{194}$, $\frac{98}{196}$, $\frac{99}{198}$, $\frac{100}{200}$.
- Any number times 1 equals itself. For example $1 \times 4 = 4$, $1 \times 37 = 37$, $1 \times 576 = 576$. Therefore, $1 \times \frac{1}{2} = \frac{1}{2}$.
- Like $\frac{1}{2}$, the number 1 has a multitude of equivalents: $\frac{2}{2}$, $\frac{4}{4}$, $\frac{10}{10}$, $\frac{50}{50}$. Whenever the numerator and denominator are the same numbers, the fraction is equivalent to one.

$$1 \times 5 = 5$$

$$\frac{3}{3} \times \frac{1}{2} = \frac{3}{6}$$

$$\frac{6}{6} \times \frac{1}{2} = \frac{6}{12}$$

How to calculate an equivalent fraction:

- To calculate an equivalent fraction, multiply the fraction by 1 or one of its equivalent fractions. Choose a number that when multiplied by the denominator will produce a sum that helps you solve a problem.
- For example:

$$1/5 = n/25$$

$$1/5 \times 5/5 = 5/25$$

$$n = 5$$

$$3/7 = n/21$$



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- Calculate the two fractions in which the denominator is 15. For example:

$$2/5 + 7/15 =$$

$$(2/5 \times 3/3) + 7/15 =$$

$$6/15 + 7/15 = 13/15$$

- Changing the denominator of 2/5 to 15 allows us to add the two fractions. This is accomplished by multiply 2/5 x 1 which equals 2/5, but using 3/3 (an equivalent of 1). Any fraction can be changed to an equivalent by multiplying times a fraction equivalent to 1.

Try This!

1. What is an equivalent fraction for $\frac{4}{5}$?

2. What is the numerator for this equivalent fraction? $\frac{5}{8} = \frac{n}{40}$

3. Are $\frac{15}{20}$ and $\frac{30}{40}$ equivalent fractions?

4. What is

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$\frac{24}{72} = \frac{n}{72}$

5. Are $\frac{5}{10}$ and $\frac{25}{55}$ equivalent fractions?
