EDUCATION
MADE SIMPLE

Arithmetic & algebra · Lesson 4/7 · ●●○ Intermediate

Equivalent fractions

What are the numerator and the denominator? When are two fractions equivalent? We see it with bars split into equal parts. Then how to simplify a fraction to lowest terms with the GCF and how to compare fractions with the LCM.

In this video we solve 3 exercises step by step.

The method

$$\frac{a}{b} = \frac{a \cdot n}{b \cdot n}$$

$$\frac{a}{b} = \frac{a \div n}{b \div n}$$

$$\text{lowest terms}: \quad \frac{a \div \text{GCF}}{b \div \text{GCF}}$$

Worked examples

Exercise 1

Complete the equivalent fraction: 2/3 = ?/12

Data: $\frac{2}{3} = \frac{?}{12}$

1. **The denominator goes from 3 to 12: multiply by 4**

$$12 \div 3 = 4$$

2. **Multiply the numerator by 4 too**

$$\frac{2}{3} = \frac{2 \cdot 4}{3 \cdot 4} = \frac{8}{12}$$

> 💡 Always both: numerator and denominator!

Result: $2/3 = 8/12$

3. **The bars agree: the same part is coloured**



✓ **Check**

$$2 \cdot 12 = 24, \quad 3 \cdot 8 = 24 \checkmark$$

Exercise 2

Write the fraction 18/24 in lowest terms.

Data: $\frac{18}{24}$

1. **Find the GCF of 18 and 24**

$$18 = 2 \cdot 3^2$$

$$24 = 2^3 \cdot 3$$

$$\text{GCF}(18, 24) = 2 \cdot 3 = 6$$

Result: $\text{GCF} = 6$

2. **Divide the numerator and the denominator by 6**

$$\frac{18}{24} = \frac{18 \div 6}{24 \div 6} = \frac{3}{4}$$

💡 3 and 4 have no common factors: it is in lowest terms

Result: $18/24 = 3/4$

3. **Same amount, with smaller numbers**



✓ **Check**

$$18 \cdot 4 = 72, \quad 24 \cdot 3 = 72 \checkmark$$

Exercise 3

Which fraction is greater: 3/4 or 5/6?

Data: $\frac{3}{4} \cdot \frac{5}{6}$

1. **To compare them we need the same denominator: the LCM**

$$\text{LCM}(4, 6) = 12$$

Result: $\text{LCM} = 12$

2. **Turn both fractions into twelfths**

$$\frac{3}{4} = \frac{3 \cdot 3}{4 \cdot 3} = \frac{9}{12}$$

$$\frac{5}{6} = \frac{5 \cdot 2}{6 \cdot 2} = \frac{10}{12}$$

Result: $3/4 = 9/12 \quad 5/6 = 10/12$

3. **Same denominator: the bigger numerator wins**

$\frac{9}{12}$
$\frac{10}{12}$



$$\frac{10}{12} > \frac{9}{12} \Rightarrow \frac{5}{6} > \frac{3}{4}$$

Result: $5/6 > 3/4$

✓ Check

$$3 \cdot 6 = 18 \ < \ 4 \cdot 5 = 20 \ \checkmark$$

. . .

© Education Made Simple