

Mathematics

Fractions:

Finding equivalent fractions.

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OAK
NATIONAL
ACADEMY

Be prepared!

Equipment Check

For this lesson you will need:

- A pencil
- A piece of paper or exercise book



Pause the video now and get your equipment ready.

Lesson Agenda

In today's lesson we are going to:

Find equivalent fractions.

- Explore the relationship between numerator and denominator
- Finding factors
- Reason about simplifying fractions
- Independent Task - practise what we have learnt
- Quiz - test what you have learnt in today's lesson

Do Now

Based on the learning in the last lesson write some equivalent fractions for:

$$\frac{8}{24}$$

Pause the video while you do so.

Relationships between numerator and denominator

$$\frac{1}{3} = \frac{8}{24}$$

Your turn: pause the video and explore the relationships between numerator and denominator **within** the fractions. Is the relationship always the same for equivalent fractions? One has been done for you.

$$\frac{1}{5} = \frac{4}{20}$$

Diagram illustrating the relationship between the fractions $\frac{1}{5}$ and $\frac{4}{20}$. The numerator 1 is multiplied by 4 to get 4, and the denominator 5 is multiplied by 4 to get 20. The relationship is also shown by multiplying the denominator 5 by 5 to get 20, and the numerator 1 by 5 to get 5.

$$\frac{2}{12} = \frac{8}{48}$$

Diagram illustrating the relationship between the fractions $\frac{2}{12}$ and $\frac{8}{48}$. The numerator 2 is multiplied by 4 to get 8, and the denominator 12 is multiplied by 4 to get 48.

$$\frac{6}{18} = \frac{12}{36}$$

Diagram illustrating the relationship between the fractions $\frac{6}{18}$ and $\frac{12}{36}$. The numerator 6 is multiplied by 2 to get 12, and the denominator 18 is multiplied by 2 to get 36.

Your turn: solutions.

Rule: equivalent fractions have the same relationship between the numerator and denominator between fractions and within fractions.

$$\frac{1}{5} = \frac{4}{20}$$

Diagram illustrating the relationship between the fractions $\frac{1}{5}$ and $\frac{4}{20}$. The relationship is shown by arrows indicating multiplication factors: $\frac{1}{5} \times 4 = \frac{4}{20}$ (top arrow) and $\frac{1}{5} \times 5 = \frac{5}{25}$ (left arrow). The bottom arrow shows $5 \times 4 = 20$ and the right arrow shows $20 \times 5 = 100$.

$$\frac{2}{12} = \frac{8}{48}$$

Diagram illustrating the relationship between the fractions $\frac{2}{12}$ and $\frac{8}{48}$. The relationship is shown by arrows indicating multiplication factors: $\frac{2}{12} \times 4 = \frac{8}{48}$ (top arrow) and $\frac{2}{12} \times 6 = \frac{12}{72}$ (left arrow). The bottom arrow shows $12 \times 4 = 48$ and the right arrow shows $48 \times 6 = 288$.

$$\frac{6}{18} = \frac{12}{36}$$

Diagram illustrating the relationship between the fractions $\frac{6}{18}$ and $\frac{12}{36}$. The relationship is shown by arrows indicating multiplication factors: $\frac{6}{18} \times 2 = \frac{12}{36}$ (top arrow) and $\frac{6}{18} \times 3 = \frac{12}{54}$ (left arrow). The bottom arrow shows $18 \times 2 = 36$ and the right arrow shows $36 \times 3 = 108$.

Finding factors

How can I find common factors to help me simplify?

$$\frac{8}{24}$$



Let's do another one together...

$$\begin{array}{r} 9 \\ \hline 15 \end{array}$$



Your turn: pause the video and create a factor bug for the numerator and denominator. Find the highest common factor and use it to simplify the fraction.

$$\frac{10}{14}$$



Reasoning about simplifying fractions

A fraction is in its simplest form when 1 is the only **common factor** of the numerator and the denominator.

$$\frac{1}{3}$$

Unit fraction

Can **non-unit fractions** be in their simplest form?

$$\frac{2}{7}$$

Non-unit fraction

Your turn: pause the video and explore whether these fractions are in their simplest form.

$$\frac{3}{4}$$

$$\frac{4}{8}$$

$$\frac{1}{6}$$

Your turn: solutions.

$$\frac{3}{4}$$

$$\frac{4}{8}$$

$$\frac{1}{6}$$

Independent Task

Independent Task: answers

Question 1

As efficiently as possible, find the simplest form of each fraction.

Draw a factor bug if you need to for the numerator and denominator of the fraction and find the highest common multiple.

a) $\frac{12}{30}$

c) $\frac{7}{35}$

b) $\frac{9}{36}$

d) $\frac{14}{26}$

Independent Task: answers

Question 2

Miss Parsons asked pupils in all year groups to completed a survey.

Here are the number of responses from the total number of pupils in each year group.

Can you find the fractions in their simplest form to find out which year group had the highest response rate?

Year group	Fraction of responses	Simplified fraction
3	$\frac{25}{30}$	
4	$\frac{33}{55}$	
5	$\frac{32}{48}$	
6	$\frac{45}{60}$	

Independent Task: answers

Question 3

Find the value of a, b and c.

$$\frac{5}{a} = \frac{b}{c} = \frac{20}{60}$$

$$a + b = 16$$