Fractions, factors and multiples (2)

National Curriculum attainment target

- Use common factors to simplify fractions; use common multiples to express fractions in the same denomination

Lesson objectives

- Use common factors to simplify fractions
- Use common multiples to express fractions in the same denomination

Previous related lesson

Unit 2, Week 2, Lesson 2

Prerequisites for learning

Pupils need to:

- understand non unit fractions
- be confident with factors and multiples

Vocabulary

greatest common factors, simplify, equivalent, multiples

Future related lesson

Unit 10, Week 2, Lesson 1

Success criteria

Pupils can:

- recognise common factors in the numerator and denominator
- use the largest common factor to simplify the fraction
- recognise common multiples in both fractions
- use the common multiple to express both fractions in the same denomination

Getting Started

- Choose an activity from Number – Fractions.

Collins Connect
Year 6, Unit 10, Week 2

Teach

Resources

mini whiteboard, pen and eraser (per child)

- Display: Slide 1. Read the fraction to the class. Say: **To reduce or simplify a fraction we need to find the common factors.**
- Ask: **What are the factors of 10?** Write 2, 5, 10 next to the numerator 10 on the board.
- Ask: **What are the factors of 30?** Write 2, 3, 5, 6, 10, 15, 30 next to the denominator 30.
- Say: **The common factors are 2, 5 and 10. So I can simplify $\frac{10}{30}$ using either the factors 2, 5 or 10.**
- Ask: **Which factor should we use to simplify it?** Ask some children to share their ideas.
- Say: **Let's simplify it by 2 first. Divide the numerator and the denominator by two.** Write = $\frac{5}{15}$ next to $\frac{10}{30}$.

Draw arrows between the numerators and denominator with ÷ 2 written on them.

- Say: **I can use the equals sign as the two fractions are equal.**
- Ask: **Can $\frac{5}{15}$ be simplified any further or is this its simplest form?** Establish that, as 5 and 15 have a common factor of 5, then it can be reduced further.
- Say: **Simplify it further using the factor 5.** Write = $\frac{1}{3}$ on the board.
- Divide the class into two groups. Give one half the factor 5 and the other half the factor 10.
- Say: **Simplify $\frac{10}{30}$ using your factor.**
- Ask a child from each group to share their working out, write the steps on the board. Establish that with 5 there were two steps, as there were with 2, but with 10 there was only one step to reach the simplest form of $\frac{1}{3}$.
- Say: **The mathematical rule is always to simplify by the greatest, or highest, common factor. This will mean fewer steps.**
- Display: Slide 2.
- Say: **Choose two of these fractions and reduce them to their simplest form. Use the greatest common factor.** Watch children's working out and discuss any steps they find challenging. Check the answers as a class.
- Say: **We have just been finding equivalent fractions using factors. Now we are going to find equivalent fractions by using multiples.**

- Display: Slide 3. Say: **These two different fractions have different denominators. We can use common multiples so they can be changed to equivalent fractions that have the same denominators.**

Record the multiples for each denominator

- Ask: **What is a common multiple of the denominators seven and five?** Establish that 35 is the first common multiple.
- Say: **Counting up in sevens, as it is the largest of the two denominators, is an efficient method. When you say each multiple check if it is also a multiple of 5. If not, keep on counting.**
- Say: **Now we can change both these fractions to 35ths.** Write = $\frac{}{35}$ next to each fraction.
- Point to $\frac{3}{7}$ and say: **As 7 must be multiplied by 5 to equal 35, then the numerator must also be multiplied by 5. 3 times 5 is 15, so $\frac{15}{35}$ is equal to $\frac{3}{7}$.**
- Say: **Change $\frac{2}{5}$ to 35ths.** Work through this as a class.
- Say: **By changing the fractions we can compare them.**
- Display: Slide 4.
- Say: **Find a common denominator to change these fractions to.** Work through this as a class.

Individualised Learning

Refer to Activity 1 from the Learning activities on page 402.

Pupil Book 6C – Page 36: Fractions, factors and multiples (2)
Resource: 0–9 dice (per child)

Progress Guide 6 – Support, Year 6, Unit 10, Week 2, Lesson 1: Equal fractions

Plenary

Resources

mini whiteboard, pen and eraser (per child)

- Display: Slide 5. Say: **There are some times in real life when simplifying fractions is useful.**
- Ask: **Can you think of an example with this pizza when fractions may be simplified?** Have a suggestion of your own ready to share. E.g. 'If I ate 4 slices of the pizza, I could say I have eaten $\frac{4}{12}$ of the pizza or I could say I have eaten $\frac{1}{3}$ of the pizza.'
- Ask some pairs to share their ideas and discuss as a class if they are realistic. Check that the fractions are simplifications of each other.
- Ask: **Do you think simplifying fractions in this way is helpful?** Discuss children's ideas.

Overcoming Barriers

- Children need a very secure understanding of common multiples in order to find common denominators and common factors in order to simplify fractions.