

MATH · Y3-Y6

# Fractions

Knowledge Organiser — KS2

## Key vocabulary

1

**Numerator**

Top number of a fraction — how many parts you have. The 3 in  $\frac{3}{4}$ .

2

**Denominator**

Bottom number — how many parts make a whole. The 4 in  $\frac{3}{4}$ .

3

**Equivalent fractions**

Different fractions with the same value.  $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{50}{100}$ .

4

**Improper fraction**

Top bigger than bottom — value greater than 1.  $\frac{7}{4}$  is improper.

5

**Mixed number**

A whole number and a fraction together.  $1\frac{3}{4}$  means  $1 + \frac{3}{4}$ .

6

**Simplify**

Find the simplest equivalent fraction.  $\frac{8}{12}$  simplifies to  $\frac{2}{3}$ .

7

**Common denominator**

The same bottom number for two or more fractions. To add  $\frac{1}{3} + \frac{1}{4}$  we change to  $\frac{4}{12} + \frac{3}{12}$ .

## Equivalent fractions

Same value, different form



- $1 = 2/2 = 3/3 = 4/4 = 8/8 = 10/10$
- $1/2 = 2/4 = 3/6 = 4/8 = 5/10 = 50/100$
- $1/4 = 2/8 = 3/12 = 25/100$
- $3/4 = 6/8 = 9/12 = 75/100$
- $1/3 = 2/6 = 3/9 = 4/12$
- $2/3 = 4/6 = 6/9 = 8/12$
- $1/5 = 2/10 = 20/100$
- Multiply (or divide) numerator AND denominator by the same number to find equivalents.

## Adding and subtracting fractions

Step-by-step rules

- SAME DENOMINATOR: just add or subtract the numerators.  $1/5 + 2/5 = 3/5$ .
- DIFFERENT DENOMINATORS: find a common denominator first.  $1/3 + 1/4$ : change to  $4/12 + 3/12 = 7/12$ .
- MIXED NUMBERS: convert to improper fractions first, then add or subtract, then convert back if needed.
- Always SIMPLIFY at the end.  $4/8$  should be written as  $1/2$ .
- Check: an answer can never have a numerator bigger than the denominator unless you've written it as a mixed number.

## Multiplying and finding fractions of amounts

Two important methods

- MULTIPLY TWO FRACTIONS: multiply numerators, multiply denominators.  $2/3 \times 3/4 = 6/12 = 1/2$ .
- FRACTION OF AN AMOUNT: divide by denominator, multiply by numerator.  $3/4$  of 20:  $20 \div 4 = 5$ ,  $5 \times 3 = 15$ .



- FRACTION  $\times$  WHOLE NUMBER: multiply numerator by the whole number.  $\frac{2}{3} \times 6 = \frac{12}{3} = 4$ .
- DIVIDING FRACTIONS BY WHOLES (Y5+): keep numerator, multiply denominator.  $\frac{1}{4} \div 2 = \frac{1}{8}$ .
- Bar models work brilliantly for fractions of amounts — see our bar model resource.

## Common mistakes to avoid

Don't add or subtract denominators!  $\frac{1}{3} + \frac{1}{4}$  is NOT  $\frac{2}{7}$ . The denominator stays the same when adding (when they're already equal), or you find a common one first. Don't forget to simplify the answer —  $\frac{6}{8}$  should usually be written as  $\frac{3}{4}$ . When a question asks for a fraction OF an amount, the answer is a number, not a fraction ( $\frac{3}{4}$  of 20 = 15, not  $\frac{15}{20}$ ). When converting improper fractions to mixed numbers, divide top by bottom —  $\frac{11}{4} = 2 \text{ r } 3 = 2 \frac{3}{4}$ . With unlike denominators, the SMALLEST common denominator is usually the LCM (lowest common multiple); using bigger common denominators works but produces messier numbers.

