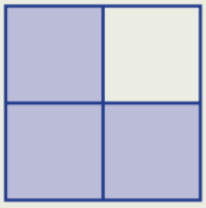
- A fraction is made up of a **nu**merator (**up**) and a **d**enominator (**d**own).

  For example: $\frac{3}{5}$ ← numerator, ← denominator

  - The **denominator** tells you how many parts the whole is divided up into.
  - The **numerator** tells you how many of the divided parts you have selected.
  - The horizontal line separating the numerator and the denominator is called the **vinculum**.

- We can represent fractions using area. If a shape is divided into regions of equal areas, then shading a certain number of these regions will create a fraction of the whole shape.

  For example:  Fraction shaded = $\frac{3}{4}$

- A **proper fraction** or **common fraction** is less than a whole, and therefore the numerator must be smaller than the denominator.

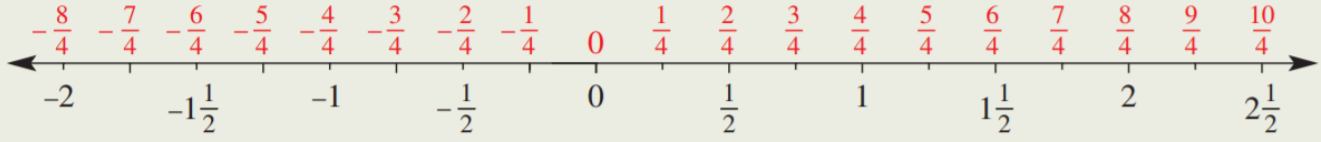
  For example: $\frac{2}{7}$ is a proper fraction.

- An **improper fraction** is greater than a whole, and therefore the numerator must be larger than the denominator.

  For example: $\frac{5}{3}$ is an improper fraction.

- We can represent positive and negative fractions on a number line.

  This number line shows the whole numbers from -2 to 2. Each unit has then been divided equally into four segments, therefore creating 'quarters'.



- Whole numbers can be represented as fractions.

  On the number line above we see that 1 is the same as $\frac{4}{4}$ and 2 is the same as $\frac{8}{4}$.

Example 6 Understanding the numerator and the denominator

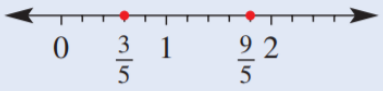
a Into how many pieces has the whole pizza been divided?
b How many pieces have been selected (i.e. shaded)?
c In simplest form, when representing the shaded fraction of the pizza:
  i what must the denominator equal?
  ii what must the numerator equal?
  iii write the amount of pizza selected (shaded) as a fraction.

SOLUTION		EXPLANATION
a	8	Pizza cut into 8 equal pieces.
b	3	3 of the 8 pieces are shaded in blue.
c **i**	8	Denominator shows the number of parts the whole has been divided into.
ii	3	Numerator tells how many of the divided parts you have selected.
iii	$\frac{3}{8}$	Shaded fraction is the numerator over the denominator; i.e. 3 out of 8 divided pieces.

Example 7 Representing fractions on a number line

Represent the fractions $\frac{3}{5}$ and $\frac{9}{5}$ on a number line.

SOLUTION



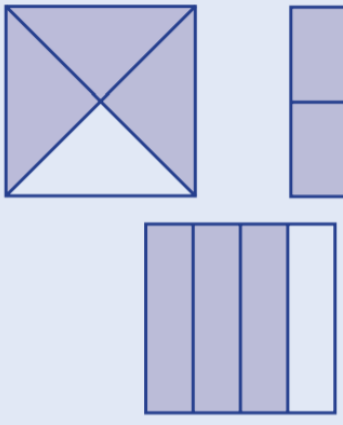
EXPLANATION

Draw a number line starting at 0 and mark on it the whole numbers 0, 1 and 2.
Divide each whole unit into five segments of equal length. Each of these segments has a length of one-fifth.

Example 8 Shading areas

Represent the fraction $\frac{3}{4}$ in three different ways, using a square divided into four equal regions.

SOLUTION



EXPLANATION

Ensure division of square creates four equal areas.
Shade in three of the four regions.