Fraction Sorting Activity

Purpose

To address facts and misconceptions about fractions and encourage a deeper understanding of what a fraction is.

Preparation

Cut out the cards on page 2 into sets with one set per group. Suggest either printing onto coloured card or coloured paper and laminating. Print one copy of the cards without cutting it up as your answer sheet and print the explanations.

Group size

Small groups of up to 5 people.

Task

Sort the cards under the three headings – Always, Sometimes and Never.

Encourage groups to note down examples to explain why they have put the cards under those headings. There are two blank cards so quick groups could write their own statements.

Once all groups are finished, go through the answers asking groups to explain their choices. They can turn over cards that they put in the right position and move to one side any they got wrong.

Answers

The cards are sorted under the correct headings on the next page. On the following pages you can find explanations and examples of some of the cards to explain why they are sorted in that way.

Always	Sometimes	Never
Finding $\frac{1}{4}$ means you are splitting something into four equal pieces.	The numerator is bigger than the denominator.	Finding $\frac{1}{8}$ is the same as finding 8%.
Writing any number as a numerator with 1 as the denominator turns that number into a fraction without changing its value.	A fraction can represent more than one whole.	In a proper fraction, the numerator is larger than the denominator.
To add and subtract fractions you should find a common denominator.	You find a common denominator by multiplying the existing denominators together.	To find $\frac{2}{5}$ you could divide by 2 and multiply by 5.

A simplified fraction does not contain any decimals.	Fractions have a value less than one.	If you multiply a fraction by 1, it will get bigger.
In an improper fraction the numerator is larger than the denominator.	If you divide a fraction, the value will get smaller.	The denominator goes on top of a fraction.
Equivalent fractions have the same value.		

Explanations

The numerator is bigger than the denominator = sometimes. True for improper fractions but not true for proper fractions.

In an improper fraction the numerator is larger than the denominator = true as this is what differentiates an improper fraction from a proper one.

Finding $\frac{1}{8}$ is the same as finding 8% = never because to find an eighth you are splitting something into 8 pieces. A percentage splits 100 into equal pieces. 100 divided by 8 is 12.5% not 8%.

Writing any number as a numerator with 1 as the denominator turns that number into a fraction without changing its value = Always true you can put 4 as $\frac{4}{1}$ and you will still have the same amount or write 120 as $\frac{120}{1}$ and it will be the same amount. You are just splitting it up into one group.

A fraction can represent more than one whole = sometimes true if it is an improper fraction. $\frac{16}{4}$ represents four wholes. A proper fraction always represents a number less than 1.

Fractions have a value less than one = sometimes. A proper fraction always represents a number less than 1 but an improper fraction represents something greater than 1.

In a proper fraction, the numerator is larger than the denominator = never because a proper fraction always has a bigger bottom!

You find a common denominator by multiplying the existing denominators together = Sometimes as this is one technique you can use, but you can also use your knowledge of times tables. For example, to do $\frac{2}{9} + \frac{1}{6}$ you could multiply 9 by 6 to get a common denominator of 54 or using your knowledge of times tables you could make the denominator 18.

To find $\frac{2}{5}$ you could divide by 2 and multiply by 5 = Never. The technique is the wrong way round as you multiply by the 2 and divide by the 5.

A simplified fraction does not contain any decimals = always. You would not write $\frac{4.2}{10.5}$. This says simplified as you might start with a fraction that has decimals in as part of a calculation but would never present it as your finished answer.

If you multiply a fraction by 1, it will get bigger = never. Multiplying anything by 1 does not change the value whether it's a whole number or a fraction.

If you divide a fraction, the value will get smaller = sometimes. If you multiply a proper fraction by another proper fraction, the value will actually get bigger. Consider $\frac{2}{5} \div \frac{3}{4}$. You would use KFC to write $\frac{2}{5} \times \frac{4}{3} = \frac{8}{15}$ this is bigger than $\frac{2}{5}$. You can prove it is bigger by turning them both into percentages $\frac{2}{5} = 40\%$ and $\frac{8}{15} = 53\%$ or by showing that $\frac{2}{5}$ is equivalent to $\frac{6}{15}$

If you divide a fraction by an improper fraction, then answer gets smaller. Consider $\frac{2}{5} \div \frac{4}{3}$. You would use KFC to write

$\frac{2}{5} \times \frac{3}{4} = \frac{6}{20}$ which is 30%. You can also show that $\frac{2}{5}$ is equivalent to $\frac{8}{20}$.