Fractions

This document is part of a set that forms the subject knowledge content audit for Key Stage 1 and Key Stage 2 maths. Each document contains: audit questions with tick boxes that you can select to show how confident you are (1 = not at all confident, 2 = not very confident, 3 = fairly confident, 4 = very confident), exemplifications; explanations; and further support links. At the end of each document, there is space to type notes to capture your learning and implications for practice. The document can then be saved for your records.

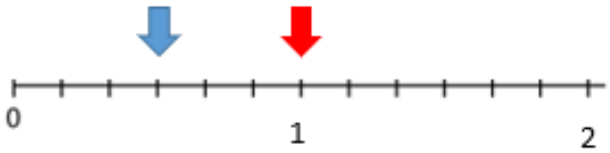
Question 7

How confident are you that you understand and can support children to understand that a fraction can be a number in its own right?

1 ☑ 2 ☐ 3 ☐ 4 ☐

How would you respond …?

a. Show $\frac{1}{2}$ on this line.



Emma has marked it with a blue arrow. Joe has marked it with a red arrow

Who is correct?

Responses

Note your responses to the questions here before you engage with the rest of this section:

Did you notice that…?

a. This question asked where $\frac{1}{2}$ is on the number line. The blue arrow identifies where $\frac{1}{2}$ is as a number in its own right. However, fractions can also be operators, e.g. find $\frac{1}{2}$ of.

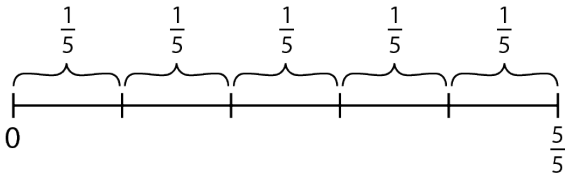
This may be how Joe has interpreted the question, as he has identified half of 2 and put his arrow at the halfway point of the whole line. In this case, the question asked to show $\frac{1}{2}$ on this line as opposed to show $\frac{1}{2}$ of this line. The blue arrow identifies where $\frac{1}{2}$ is as a number. The red arrow identifies where $\frac{1}{2}$ of the line is. In this case, the blue arrow is correct. Emma has identified where $\frac{1}{2}$ is on this number line.

Fractions

Children's first experiences of fractions are where they have been used as an operator; talking about one-third **of** this shape or one-fifth **of** this line. However, as well as operators (e.g. $\frac{1}{4}$ of), fractions are also 'numbers' in their own right (e.g. the number $\frac{1}{4}$ which also has a value of 0.25). It may seem obvious to adults that fractions are numbers, but it is not unusual for children to think that fractions are just a part of something; they are usually quite surprised to discover they are numbers too.

Fractions can be placed on a number line. Children have already looked at fractions **of** lines but this is not the same as a fraction **on** a number line. The distinction will be made between one-fIfth of this line (a 'part' of a line) and the number one-fifth ($\frac{1}{5}$) that sits at a 'point' on a number line.

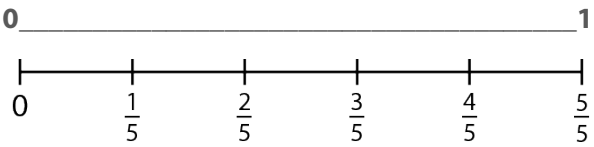
To introduce this, children can use their knowledge of fractions to divide up a line:



Each interval on the number line shown above is one-fifth **of** the whole. As we add additional fifths, we move along the number line from 0 to $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$ and so on.

Alongside this, a parallel line can be shown that is part of a number line. Encourage the children to imagine 'zooming in' on the section between 0 and 1. Explain that this point can have a value too.

It is helpful to have the same size of line as the example, divided into fifths, with the equal part marked. Encourage the children to explain what each of those marks could represent. Identify the point as one fifth specifying this is not of the whole line but a number between 0 and 1.



Note the difference in the recording – the fractional amount is shown by a bracket above the part – this piece is $\frac{1}{5}$ of the whole. When fractions, as numbers in their own right are shown, a specific point on the number line is marked.

When discussing numbers that are fractions, they are often referred to as 'fractions' rather than 'numbers'. For example, in discussing where two-fifths sits in the number system, one might ask, '*Where would we place this **fraction** on the number line?*'' Develop the habit of alternating this with language, such as, *'Where would we place this **number** on the number line?'* so that children become used to hearing fractions referred to as numbers.

Common errors in this area may include:

- only recognising fractions as operators and not seeing them as a number in their own right.

What to look for

Can a child:

- label a point on a number line (between two whole numbers) and use the language of fractions to state the value of that point?

Links to supporting materials:

NCETM Primary Professional Development materials, Spine 3: Fractions:

- Topic 3.3: Non-Unit Fractions: Identifying, Representing and Comparing

Notes:

Key learning from support material and self-study:

What I will focus on developing in my classroom practice: