

Portfolio task 4.1

You will need to work with a small group of friends or colleagues. Take it in turns to pick up a number of small cubes, between 5 and 12. Drop them onto a flat surface and cover them with a piece of cloth. Remove the cloth so that your friends can see the cubes but replace it before they have chance to 'count' the cubes. Ask them how many cubes they saw. Then ask how they calculated. It is likely that the group will have counted in '2's, or '3's, or even larger groups depending on the arrangement of the cubes. Try this several times with increasing numbers of cubes to see how many cubes they can 'count' in this way.

Portfolio task 4.2

Can you think of examples of children who do not yet understand these principles? For example, a child who is asked to count seven multilink cubes laid out in a row and then count them again when you put them into a different arrangement to 'check' there are still seven would not yet understand the order irrelevance principle. Write your examples and enter this reflection in your personal portfolio.

Portfolio task 4.3

Can you think of examples of children who do not yet make the link between the numerical symbols and the results of a count? I have heard children ask how to 'spell' a certain number. They might count 15 ducks in a pond and ask, 'How do you spell 15?' Alternatively they may recognise particular numbers such as their age, the house number they live at, or the bus they catch to school, and not connect this to the numbers on a number line. Reflect on these experiences and add this to your portfolio.

Portfolio task 4.4

Take as large a sheet of paper as you can get hold of. Write $\frac{1}{2}$ in the centre. Now create a web diagram with as many different representations of $\frac{1}{2}$ as you can think of. These might be diagrams with $\frac{1}{2}$ shaded in different ways, they might be equivalent fractions, or they might be percentages. When you have exhausted this idea pick another fraction which is linked to $\frac{1}{2}$ in some way. So you might choose $\frac{1}{4}$ (which is $\frac{1}{2}$ of a $\frac{1}{2}$). Create another family of representations for a quarter. Carry on filling the paper with as many different fractions as you can think of.

Portfolio task 4.5

Write down all the errors that you can remember children making when they have named or written down fractions. For each example decide whether the children's misconception was based in a misunderstanding of the language of naming and writing fractions or a lack of clarity around what defines the numerator and denominator of a fraction. Add these notes to your portfolio.

Portfolio task 4.6

Can you write down 2.75 as a fraction and a percentage? Can you do the same for 1.5 and 4.9?

Portfolio task 4.7

Use a calculator to explore the following fractions in their decimal forms. What do you notice about the patterns that are formed?

a. $1/3$, $2/3$, $3/3$

b. $1/6$, $2/6$, $3/6$, $4/6$, $5/6$, $6/6$

c. $1/9$, $2/9$, $3/9$, $4/9$, $5/9$, $6/9$, $7/9$, $8/9$, $9/9$

What other fraction families give you recurring decimals?

Portfolio task 4.8

Look back over the misconceptions you have explored in this chapter. Which of the misconceptions did you share? How do you think you developed this misconception? What might a teacher have done to support you in overcoming the misconception?

Before moving on to the case study section, try to write a convincing explanation to support a colleague in understanding why this misconception is incorrect. Add this to your portfolio.