

Ratio and Proportion Prior Learning Assessment Q1:

Objective: I understand what ratio and proportion is and how this can be presented.

NC RP 1: solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts

Teacher Input Ideas:

Below are suggested activities to progress through with the children. You may want to spread these across one lesson using some as a whole class inputs or as a carousel of activities. Alternatively, you may want to spread these across a series of lessons to enable the children to develop their understanding. This will be the first time that ratio and proportion will have been introduced to many children. There are lots of practical and hands on activities to support the children with their understanding of ratio and proportion.

Practice Activities

Purple Practice: Introduce ratio through using a multi pack of crisps. Discuss how many packets they think are in the bag. What flavours do you think there will be? Do you think there will be the same amount of each flavour? Open the multipack. Count how many there are altogether. Now begin to look at the different packets included. Inform the children that today we are going to look at the proportion of the multi pack for each flavour. Discuss what this key word means. Encourage the children to use their knowledge of fractions. There are 24 packets in the multi pack and 5 are salt and vinegar. Ask the children for suggestions as to how they would record this. Encourage the children to record as a fraction. The proportion of the multipack is $\frac{5}{24}$ for salt and vinegar. Children to do the same for the other flavours (ensure that there is a difference in amounts of each flavour).

When the children show understanding of this, introduce ratio. How can we compare the amount of salt and vinegar with prawn cocktail? Ask children for suggestions. Model writing both as a fraction $\frac{5}{24}$ and $\frac{4}{24}$. Introduce a new way to recording this. Some people record this differently to show the ratio of salt and vinegar to prawn cocktail. Rather than writing the whole fraction, people record it like this 5:4. I have 5 salt and vinegar crisps to 4 prawn cocktail. Discuss what ratio means and repeat with other flavours of crisps. Discuss how people know which is salt and vinegar and which is prawn cocktail.

When children are ready, they could have images or actual packets of crisps in different flavours to explore what the ratio is and how it is presented. Children to be given the box/bag of crisps and record what the ratios are. Suggested are 3 levels to the activity:

- 1) Children to record the ratios for their bag of crisps and explore different combinations.
- 2) Children can record the ratio for 3 flavours (example 3:4:1)
- 3) Children can compare this with the fraction (you may want the children to record the fraction out of the two flavours so that the children can see the link between ration and proportion. For example: for salt and vinegar and prawn cocktail, there are 9 packets altogether so $\frac{5}{9}$ & $\frac{4}{9}$ is how it can be recorded).

Other resource ideas: fruit in a fruit bowl, different coloured sweets in a packet, colour of eyes. Children to take photographs of the crisps/sweets and record the ratios that they have found.

Green Practice:

For the yellow activity, the children are required to use a large box of sweets. You may want to make salt dough sweets for the children to use. This activity also provides the children with an introduction as to how ratio can be used in recipes.

Provide the children with the information for the recipe:

You need 2 cups of flour ,1 cup salt and 1 Cup water.

Ask the children how they would record is as a ratio (2:1:1)

Encourage the children to use cups to measure out the ingredients needed and mix together to make salt dough.

Suggested are 3 ways for children to apply understanding of ratio:

- 1) Children to work in pairs to make the salt dough. Children to then combine their dough with another group. What is the ratio now? How many cups of water? Children to combine the dough with more groups or the whole table and to record the ratios they have made. Ask the children, if we wanted to make a group one now with new ingredients, how many cups of flour will I need if I put in 5 cups of water?
- 2) Children to make different shaped sweets and provide the children with ratios to make these. Give the children guidelines such as each sweet should be no bigger than or weigh no more than, so that that the dough goes further. Provide the children with images for the children to make such as the orange sweets are thin rectangles and so are the biscuit ones. The strawberry ones are oval. The

children could then be given ratios to follow such as 5 rectangle sweets to every 2 oval sweets. Encourage the children to have some dough remaining. Can you follow that ratio again with this left-over dough? So how many sweets have you made altogether? What proportion are oval? What proportion are rectangle? What is the ratio or rectangle to oval? If I have 15 rectangle sweets how many oval ones have you made?

- 3) Children could make the paint to make different coloured sweets. Provide the children with different ratios to mix different colours using only primary colours and white and black. Children could also explore their own ratios that they have used to make the paint.

Yellow: Set up the classroom as a sweet factory. Inform the children that today they are going to be packaging the sweets ready to be sold. The sweets the children have made can be used or you can provide the children with pre-bought sweets to package.

They are to be given a check list of what they are required to pack. For example:

Orange chocolates to toffees 2:5

Provide the children with lots of different ratios for the children to place into the box such as:

raisin: biscuit: toffee 3:4:2

Suggested are 3 levels for the activity:

- 1) Children to be given ratios for 2 to 3 chocolates at a time. The children are to place these in their large chocolate box. Then prompt the children to suggest that more chocolates can fit in. Let's use these ratios again. If I place 2 orange chocolates in, how many toffees shall I put in? Children to work out how many of each chocolate is in the box. They may need to add these practically.
- 2) As above but can also find the proportion of each chocolate. Can the children simplify any of their ratios or fractions?
- 3) Give the children the ratios for different chocolates, such as 4:3 for toffees to orange chocolates. Before the children sort the chocolates, introduce the children to the idea that more chocolates can be placed in as the box is large. We can still use the same ratio; however, we will start with placing 16 toffees in the box. How many orange ones do I need? What did you do to work this out? How can I use this knowledge to work out the other chocolate ratios? What will their new ratios be?

You may want to encourage children to make some recordings of the calculations they are performing and how they are working out the answers. Discuss how the children are using times tables facts to work out the answer.

Mastery: The children are presented with a ratio problem. Encourage the children to draw images to support them or to use their knowledge of times tables to work out the amounts of each cake using the ratio given.

Mastery:

- 1) 25 chocolate cakes
- 2) 50 chocolate cakes and 30 strawberry cakes.

Tia and Nikhil are having a cake sale at school to raise money for charity.



They decide to make chocolate cupcakes and strawberry cupcakes.

They use this ratio

$$\begin{array}{ccc} \text{Chocolate cakes} & & \text{Strawberry cakes} \\ & 5 : & 3 \end{array}$$

- 1) Nikhil makes 15 strawberry cakes. How many chocolate cakes does Tia need to make?

- 2) They decide they need to make 80 cakes in total. How many chocolate cakes does Tia need to make and how many strawberry cakes does Nikhil need to make in total?