Ratio and Proportion Prior Learning Assessment Q2 and Q10:

Objective: I can solve a ratio and proportion word problems using calculations or drawings to help me.

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:

Recap with the children what proportion is and how we presented some of the sweets as a fraction to show the proportion in the lesson for the Q1 objective. For example, 5 salt and vinegar packets of crisps in a multi pack so 5/24.

Introduce a word problem practically with objects to help the children to understand what the question is asking.

5 cakes cost £2. I want to buy 7 cakes. How much will it cost. Ask children for suggestions as to how I can work it out? So, the whole amount I have is £2.00 for 5 cakes. A whole group of 5 cakes cost 2 pounds. I need to work out 7/5. If I work 1/5 I can use this to help.
1/5 of 2 pounds is 40p. I need 7/5 so 7 x 40 = £2.80. If children are finding this hard you could have 2 pounds in 20p or 10p coins to show how we are sharing the amounts between the 5 cakes to find 1/5. You could then add 2 more cakes to make 7 and 40p for each cake to show the children how we do this with images/objects. Ask the children for their suggestions and any calculations they used. Discuss the link between fractions and division.

Model using knowledge of multiples and divisors to work out other problems. Such as: At the shop, you can buy 3 cakes for £2.40. I spend £3.20. How many cakes did I buy? Ask the children how would they work it out? What information do they know from the problem? How can they use this to help? Model using knowledge of fractions and proportion to help. So, for £2.40 I can by 3 cakes so 3/3 or 1 whole group = £2.40. Model using images if this helps children or cakes. I need to work out how much one cake costs. 1/3 of £2.40 = 1 cake. Establish £2.40 divided by 3 = 80p (As I know 24 divided by 3 = 8). So, 1 cake is 80p. I spend £3.20. I know that 32 is a multiple of 8. 4 x 8 = 32, therefore 4 cakes would be £3.20

Practice Activities

Purple Practice: Most suited for children who demonstrate little understanding in the prior assessment task.

The children are presented with 3 word problems to solve. The children should be encouraged to work out their answers using their knowledge of fractions or images to

help them find the proportion of the amounts. For example, the for first question the children should understand that the whole group has 4 apples and the amount for the whole group is £1.80. So, the children need to find the proportion of the money for 1 apple to help them. 1 apple is $\frac{1}{4}$ of the money. £1.80 divided by 4 = 45p. They want to find 5/4 for 5 apples so 5 x 45 = £2.25. If the children are finding this hard they could be given 4 apples and £1.80 in coins. The children could share the £1.80 between the apples to work out what they have paid for each apple. The children could then add one more apple and the same amount of money and calculate 5 x 45p.

Green Practice: Most suited for children who made errors in Q2 of the prior learning assessment.

As above the children are presented with 3 word problems to solve. The children should be encouraged to work out their answers using their knowledge of fractions to help them find the proportion of the amounts. If the children require resources to work these out such as weighing scales, provide them with the opportunity and allow the children ways to suggest solutions. Model and encourage children to use knowledge of divisors and multiples where appropriate.

Yellow: practical- Find 4 different recipes for the children to use such as smoothies, cakes, pizza and fruit salad.

Provide the children with the recipes to follow and the ingredients. Encourage the children to look at the ingredients and spot that they have a problem with each recipe. Such as:

- This recipe serves 4 people and I want to make it for 6 people. (Link to fraction knowledge: 6/4 is the same as 3/2, so 3 lots of half or 1 and $\frac{1}{2}$ of each ingredient).
- The recipe requires 120g of milk but I have 90g. (link to fraction knowledge: 90/120 = 9/12 = $\frac{3}{4}$ so I need to find $\frac{3}{4}$ of the other ingredients). How many porridge oats do I need?
- The recipe uses 2 eggs but I want to use up the 4 eggs I have in my cupboard. How many grams of flour do I need?
- The recipe states I need 120g of mushrooms but I only have 80g. How many grams of chopped tomatoes do I need to use?

Mastery: The children are presented with a recipe and 3 different scenarios to alter the recipe. Provide the children with opportunities to discuss how they worked out the answer and any difficulties they had (such as trying to find 2/3 of 4 eggs). Encourage the children to suggest what they would do in this situation when baking at home, linking to everyday problems.

Larger mastery opportunity: You may want to set the children a large project to work on, where they can apply many different skills. For example, planning their own fundraising cake sale. There are many opportunities to apply skills, such as:

- Complete data handling activities to find out popular flavours of cakes.
- Present this data in a pie chart.
- Use this information to create own ratio for making the cakes (such as 5 chocolate cakes to every 2 vanilla cakes).
- Alter the recipe/ingredients to their requirements (For example they may need to make 20 chocolate cakes and have a recipe for 16 cakes).
- Measure ingredients (recipe may be in oz. so children could convert to grams).
- Explore how to sell their cakes in groups by finding out the average number of cakes in a packet sold in shops (applying knowledge of mean).
- Calculate how much to sell the cakes for (could apply knowledge of percentages by adding a certain percentage to make profit on each cake).
- Use addition, multiplication and subtraction skills to calculate costs of ingredients to make the cakes and when selling the cakes.

Answers

Purple:

1) £2.25

2) 7

3) £1.80

Green answers

1) 56p
2) 4 ½ miles
3) £2.70

Mastery:

1) 120g flour, 75 ml milk, 120g sugar, 2 eggs
2) 180g flour, 112.5 ml milk, 180g sugar, 3 eggs
3) 160g flour, 100ml milk, 160 g sugar, 2 2/3 egg (take suggestions for using 2 or 3 eggs or altering whole ingredients for 2 eggs)

BRICKWORK Mathematics

Purple Practice:

Lo: I solve problems using my knowledge of proportions and fractions to help me.

Look at the word problems below. Use objects, drawings or your knowledge of fractions to work out the answers.

1) It costs £1.80 for 4 apples. Amir buys 5 apples. How much will he pay?

2) Stacey is buying Christmas decorations. On Monday, she buys three of the same ones for £1. 80. She returns later in the week to buy more. In total, she spends £4.20 on decorations. How many did she buy altogether?

3) It costs £1.20 for 100g of pick a mix sweets at the cinema. Sophie weighs her sweets. She has 150 g. How much will she pay?

BRICKWORK Mathematics

Green Practice
Lo: I solve problems using my knowledge of proportions and fractions to help me.

Look at the word problems below. Use objects, drawings or your knowledge of fractions to work out the answers.

1) Sandie buys 5 oranges for £1.40. Michael buys 2 oranges. How much does he pay for his oranges?

2) James wants to record how far he walks each day. On Monday James walked 3 miles in 72 minutes. On Tuesday James forgot to measure how far he walked. He walked for 108 minutes. How far did he walk?

3) It costs £1.20 for 100g of pick a mix sweets at the cinema. Sanjay weighs his sweets. He has 225 g. How much will it cost him?

BRICKWORK Mathematics

Mastery

Here are the ingredients to make 24 cupcakes:

240g flour

150ml milk

240g sugar

4 eggs

Alter the recipe for each scenario:

I only want to make 12 cakes

I only have 3 eggs

I only have 160g of flour