

# Reasoning and Problem Solving

## Step 9: Fractions of a Quantity

### National Curriculum Objectives:

Mathematics Year 4: (4F2) [Recognise and show, using diagrams, families of common equivalent fractions](#)

Mathematics Year 4: (4F10a) [Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number](#)

### Differentiation:

Questions 1, 4 and 7 (Problem Solving)

**Developing** Calculate a given amount when finding fractions of quantities. Involves unit fractions only.

**Expected** Calculate a given amount when finding fractions of quantities. Involves non-unit fractions in their simplest form.

**Greater Depth** Calculate a given amount when finding fractions of quantities. Involves non-unit fractions that need to be simplified first.

Questions 2, 5 and 8 (Reasoning)

**Developing** Solve a word problem when finding a fraction of a quantity. Involves unit fractions only.

**Expected** Solve a word problem when finding a fraction of a quantity. Involves non-unit fractions in their simplest form.

**Greater Depth** Solve a multi-step word problem when finding a fraction of a quantity. Involves non-unit fractions that need to be simplified first or use of related facts.

Questions 3, 6 and 9 (Reasoning)

**Developing** Decide which statement is correct when finding fractions of quantities. Involves unit fractions only.

**Expected** Decide which statement is correct when finding fractions of quantities. Involves non-unit fractions in their simplest form.

**Greater Depth** Decide which statement is correct when finding fractions of quantities. Involves non-unit fractions that need to be simplified first or use of related facts.

More [Year 4 Fractions](#) resources.

Did you like this resource? Don't forget to [review](#) it on our website.

## Fractions of a Quantity

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1a. Below is the recipe for 18 oat pancakes. Kelly only needs to make  $\frac{1}{2}$  of that number of pancakes.

### Oat Pancake Ingredients

4 eggs  
120g oats  
60ml milk  
2 bananas

How much of each ingredient will she need?



PS

1b. Below is the recipe for 4 smoothies. Gabriel only needs to make  $\frac{1}{4}$  of that amount of smoothie.

### Smoothie Ingredients

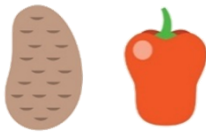
20 strawberries  
4 bananas  
400ml of milk  
24 raspberries

How much of each ingredient will he need?



PS

2a. Tom is making a stew. The recipe says to use  $\frac{1}{4}$  the amount of potatoes as peppers. Tom uses 16 peppers but he's unsure of how many potatoes to use.

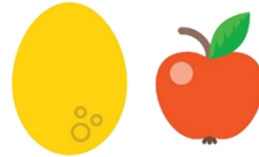


How many potatoes does Tom need?  
Show your working.



R

2b. Tina is making a fruit salad. The recipe says to use  $\frac{1}{2}$  the amount of melons as apples. Tina uses 12 apples but she's unsure of how many melons to use.



How many melons does Tina need? Show your working.



R

3a. Alice and Chuan are calculating  $\frac{1}{5}$  of 35.



Alice

The answer is 28.

The answer is 7.



Chuan

Who is correct? Explain how you know.



R

3b. Hannah and Sean are calculating  $\frac{1}{4}$  of 28.



Hannah

The answer is 7.

The answer is 14.



Sean

Who is correct? Explain how you know.



R

## Fractions of a Quantity

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4a. Below is the recipe for 4 cupcakes.  
Lucy only needs to make 3 cupcakes.

### Cupcake Ingredients

4 eggs  
200g self-raising flour  
100g butter  
80g sugar

How much of each ingredient will she need?



PS

4b. Below is the recipe for 3 cookies. Sean only needs to make 2 cookies.

### Cookie Ingredients

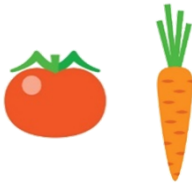
3 eggs  
120g plain flour  
90g butter  
75g sugar

How much of each ingredient will he need?



PS

5a. Tim is making a sauce. The recipe says to use  $\frac{2}{3}$  the amount of carrots as tomatoes. Tim uses 15 tomatoes but he's unsure of how many carrots to use.



How many carrots does Tim need?  
Explain how you know.



R

5b. Tara is making a marmalade. The recipe says to use  $\frac{5}{6}$  the amount of lemons as oranges. Tara uses 18 oranges but she's unsure of how many lemons to use.



How many lemons does Tara need?  
Explain how you know.



R

6a. Hafsa and Gabriel are calculating  $\frac{5}{6}$  of 48.



The answer is 40.

Hafsa

The answer is 12.



Gabriel

Who is correct? Explain how you know.



R

6b. Sinead and Johnny are calculating  $\frac{2}{5}$  of 35.



Sinead

The answer is 21.

The answer is 14.



Johnny

Who is correct? Explain how you know.



R

## Fractions of a Quantity

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7a. Below is the recipe for 36 blueberry muffins. Jo only needs to make 30 muffins.

### Muffin Ingredients

6 eggs  
240g all-purpose flour  
180g butter  
120g sugar  
60g blueberries

How much of each ingredient will she need?



PS

7b. Below is the recipe for 45 flapjacks. Ben only needs to make 36 flapjacks.

### Flapjack Ingredients

175g oats  
125g butter  
100g sugar  
5 tbsp golden syrup  
50g dried fruit

How much of each ingredient will he need?



PS

8a. Todd is making 6 pies. The recipe says to use  $\frac{3}{7}$  the amount of pears as plums for each pie. Todd uses 14 plums for a pie but he's unsure of how many pears to use.



How many pears does Todd need for 6 pies? Explain how you know.



R

8b. Tera is making soup for 8. The recipe says to use  $\frac{2}{9}$  the amount of chillies as garlic for each person. Tera uses 18 garlic pieces for 2 people but she's unsure of how many chillies to use.



How many chillies does Tera need for 8 portions of soup? Explain how you know.



R

9a. Steph and Cian calculated  $\frac{6}{8}$  of 32.



Steph

I just need to double the answer to calculate  $\frac{6}{8}$  of 96.

The answer is the same as  $\frac{2}{8}$  of 96.



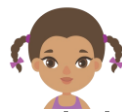
Cian

Who is correct? Explain how you know.



R

9b. Isabel and Jake calculated  $\frac{4}{12}$  of 72.



Isabel

The answer is the same as  $\frac{4}{6}$  of 36.

I can multiply the answer by 10 to calculate  $\frac{8}{12}$  of 720.



Jake

Who is correct? Explain how you know.



R

## Reasoning and Problem Solving Fractions of a Quantity

### Developing

- 1a. 2 eggs, 60g of oats, 30ml of milk, 1 banana.
- 2a. Tom needs 4 potatoes because  $16 \div 4 = 4$  and  $4 \times 1 = 4$ .
- 3a. Chuan is correct. Alice has taken one fifth away from 35.

### Expected

- 4a. 3 eggs, 150g of self-raising flour, 75g of butter and 60g of sugar.
- 5a. Tim needs 10 carrots because  $15 \div 3 = 5$  and  $5 \times 2 = 10$ .
- 6a. Hafsa is correct. Gabriel has only calculated one quarter of 48.

### Greater Depth

- 7a. 5 eggs, 200g flour, 150g butter, 100g sugar, 50g blueberries.
- 8a. Todd needs 36 pears in total because  $\frac{3}{7}$  of 14 is 6. That's enough pears for 1 pie but because Todd is making 6 pies, he needs to multiple 6 by 6 to get 36 pears in total.
- 9a. Cian is correct because 96 is three times larger than 32 and the fraction is three times smaller so it will produce the same answer.

## Reasoning and Problem Solving Fractions of a Quantity

### Developing

- 1b. 5 strawberries, 1 banana, 100ml of milk, 6 raspberries
- 2b. Tina needs 6 melons because  $12 \div 2 = 6$  and  $6 \times 1 = 6$ .
- 3b. Hannah is correct. Sean has calculated half of 28.

### Expected

- 4b. 2 eggs, 80g of plain flour, 60g of butter and 50g of sugar
- 5b. Tara needs 15 lemons because  $18 \div 6 = 3$  and  $3 \times 5 = 15$ .
- 6b. Johnny is correct. Sinead has calculated three fifths of 35.

### Greater Depth

- 7b. 140g oats, 100g of butter, 80g of sugar 4tbsp of golden syrup and 40g of dried fruit.
- 8b. Tera needs 16 chillies in total because  $\frac{2}{9}$  of 18 is 4. That's enough chillies for 2 people but because Tera is making 6 soup for 8 people, she needs to multiple 4 by 4 to get 16 chillies in total.
- 9b. Isabel is correct because 36 is half of 72 and the fraction is double the original so it will produce the same answer.