

# Reasoning and Problem Solving

## Step 3: Percentage of an Amount 1

### National Curriculum Objectives:

Mathematics Year 6: (6R2) [Solve problems involving the calculation of percentages \[for example, of measures, and such as 15% of 360\] and the use of percentages for comparison](#)

Mathematics Year 6: (6F11) [Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts](#)

### Differentiation:

Questions 1, 4 and 7 (Problem Solving)

**Developing** Work out whether or not a percentage target has been met by various contributions. 50% and 10% are included, and no conversions are required.

**Expected** Work out whether or not a percentage target has been met by various contributions. 50%, 25%, 10% and 1% are included, and some conversions are required.

**Greater Depth** Work out whether or not a percentage target has been met by various contributions. 50%, 25%, 10% and 1% are included, some conversions are required and numbers with up to two decimal places are used.

Questions 2, 5 and 8 (Problem Solving)

**Developing** Change the percentage or the amount in a calculation to reach the target answer. 50% and 10% are included, and no conversions are required.

**Expected** Change the percentage or the amount in a calculation to reach the target answer. 50%, 25%, 10% and 1% are included, and some conversions are required.

**Greater Depth** Change the percentage or the amount in a calculation to reach the target answer. 50%, 25%, 10% and 1% are included, some conversions are required and numbers with up to two decimal places are used.

Questions 3, 6 and 9 (Reasoning)

**Developing** Give an example to show a statement about percentages can be true, or false. 50% and 10% are included.

**Expected** Give a pair of examples which show a statement about percentages can sometimes be true and sometimes be false. 50%, 25%, 10% and 1% are included.

**Greater Depth** Give a pair of examples which show a statement about percentages can sometimes be true and sometimes be false. 50%, 25%, 10% and 1% are included and conversions are required.

More [Year 6 Percentages](#) resources.

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## Percentage of an Amount 1

1a. Anjay is trying to raise £40. He wanted to raise 50% of that total amount at a fundraising party. He kept a record of how much people gave:

<u>Person</u>	<u>Amount given</u>
Rich Fella	10% of £80
Guy Withmoney	10% of £30
Lotta Cash	50% of £10

How much money did he raise at the party? Did he reach 50% of £40?



PS

## Percentage of an Amount 1

1b. Leah is trying to raise £6,000. She wanted to raise 10% of that total amount at a fundraising party. She kept a record of how much people gave:

<u>Person</u>	<u>Amount given</u>
Carrie Dollars	50% of £250
Bill Mybank	50% of £370
Angel Hinvesta	10% of £3,000

How much money did she raise at the party? Did she reach 10% of £6,000?



PS

2a. Ollie and Shae are trying to get the largest answer by changing one part of the calculation below.

$$10\% \text{ of } 80\text{kg} = 8\text{kg}$$

Ollie says, "If I find 10% of 100kg, instead of 80kg, my answer will be largest."

Shae says, "I will change the percentage to find a larger answer."

What percentage could Shae change 10% to in order to get the largest answer?



PS

2b. Finny and Max are trying to get the smallest answer by changing one part of the calculation below.

$$50\% \text{ of } 110\text{m} = 55\text{m}$$

Finny says, "If I find 10% of 110m, instead of 50%, my answer will be smallest."

Max says, "I will change the number of metres to find a smaller answer."

What number could Max change 110m to in order to get the smallest answer?



PS

3a. Esme is thinking about percentages.

10% of one amount is less than 50% of a different amount.



Give an example to show that Esme's statement can sometimes be true.



R

3b. Karl is thinking about percentages.

50% of one amount will be more than 10% of a different amount.



Give an example to show that Karl's statement can sometimes be false.



R

## Percentage of an Amount 1

4a. Michelle is trying to raise £500. She wanted to raise 25% of that total amount at a fundraising party. She kept a record of how much people gave:

<u>Person</u>	<u>Amount given</u>
Owen Lotts	1% of £6,800
Penny Pincher	10% of £360
Noah Goodeal	50% of £66

How much money did she raise at the party? Did she reach 25% of £500?



PS

## Percentage of an Amount 1

4b. Elliot is trying to raise £16,000. He wanted to raise 1% of that total amount at a fundraising party. He kept a record of how much people gave:

<u>Person</u>	<u>Amount given</u>
Milly Yonaire	25% of £180
Anna Notherquid	25% of £148
Landon Hisfeet	10% of £770

How much money did he raise at the party? Did he reach 1% of £16,000?



PS

5a. Shona and Toby are trying to get the largest answer by changing one part of the calculation below.

$$1\% \text{ of } 13\text{m} = 13\text{cm}$$

Shona says, "If I find 25% of 13m, instead of 1%, my answer will be largest."

Toby says, "I will change the number of metres to find a larger answer."

What amount could Toby change 13m to in order to get the largest answer?



PS

5b. Theo and May are trying to get the smallest answer by changing one part of the calculation below.

$$25\% \text{ of } 5\text{L} = 1,250\text{ml}$$

Theo says, "If I find 25% of 2L, instead of 5L, my answer will be smallest."

May says, "I will change the percentage to find a smaller answer."

What percentage could May change 25% to in order to get the smallest answer?



PS

6a. Harry is thinking about percentages.

10% of one amount will be more than 1% of a different amount.



Give one example to show Harry's statement can be true, and one example to show it can be false.



R

6b. Josie is thinking about percentages.

1% of one amount will be less than 25% of a different amount.



Give one example to show Josie's statement can be true, and one example to show it can be false.



R

## Percentage of an Amount 1

## Percentage of an Amount 1

7a. Dylan is trying to raise £485. He wanted to raise 50% of that total amount at a fundraising party. He kept a record of how much people gave:

<u>Person</u>	<u>Amount given</u>
Ruby Dealer	25% of £335
Liv Decadent-Lee	1% of £4,540
Max Profits	10% of £1,196

How much money did he raise at the party? Did he reach 50% of £485?



PS

7b. Sienna is trying to raise £1,610. She wanted to raise 25% of that total amount at a fundraising party. She kept a record of how much people gave:

<u>Person</u>	<u>Amount given</u>
Ivor Fortune	1% of £11,170
Kitty Isfull	1% of £16,320
Chase Wonga	50% of £255

How much money did she raise at the party? Did she reach 25% of £1,610?



PS

8a. Cal and Eva are trying to get the smallest answer by changing one part of the calculation below.

$$25\% \text{ of } 2.35\text{km} = 587.5\text{m}$$

Cal says, "If I find 25% of 1.67km, instead of 2.35km, my answer will be smallest."

Eva says, "I will change the percentage to find a smaller answer."

What percentage could Eva change 25% to in order to get the smallest answer?



PS

8b. Nia and Arlo are trying to get the largest answer by changing one part of the calculation below.

$$10\% \text{ of } 4.5\text{cm} = 4.5\text{mm}$$

Nia says, "If I find 25% of 4.5cm, instead of 10%, my answer will be largest."

Arlo says, "I will change the number of centimetres to find a larger answer."

What number could Arlo change 4.5cm to in order to get the largest answer?



PS

9a. Layla is thinking about percentages.

1% of a number of kilograms will be more than 50% of a different number of grams.



Give one example to show Layla's statement can be true, and one example to show it can be false.



R

9b. Aiden is thinking about percentages.

10% of one number of centimetres will be less than 25% of a different number of metres.



Give one example to show Aiden's statement can be true, and one example to show it can be false.



R

## Reasoning and Problem Solving Percentage of an Amount 1

### Developing

- 1a. £16, no  
2a. Any percentage larger than 12.5%  
3a. Various answers, for example:  
10% of 10 = 1, and 50% of 6 = 3

### Expected

- 6a. £137, yes  
7a. Any amount larger than 325m  
8a. Various answers are possible.  
To show it can be true:  
10% of 70 = 7, and 1% of 200 = 2  
To show it can be false:  
10% of 30 = 3, and 1% of 2,500 = 25

### Greater Depth

- 11a. £248.75, yes  
12a. Any percentage smaller than 17.76%  
13a. Various answers are possible.  
To show it can be true: 1% of 12kg = 120g,  
and 50% of 150g = 75g  
To show it can be false: 1% of 1kg = 10g,  
and 50% of 40g = 20g

## Reasoning and Problem Solving Percentage of an Amount 1

### Developing

- 1b. £610, yes  
2b. Any amount smaller than 22m  
3b. Various answers, for example:  
50% of 20 = 10, and 10% of 120 = 12.

### Expected

- 6b. £159, no  
7b. Any percentage smaller than 10%  
8b. Various answers are possible.  
To show it can be true:  
1% of 400 = 4, and 25% of 20 = 5  
To show it can be false:  
1% of 2,000 = 20, and 25% of 24 = 6

### Greater Depth

- 11b. £402.40, no  
12b. Any number larger than 11.25cm  
13b. Various answers are possible.  
To show it can be true: 10% of 730cm =  
73cm, and 25% of 4m = 100cm.  
To show it can be false: 10% of 990cm =  
99cm, and 25% of 3m = 75cm.