

Reasoning and Problem Solving

Step 5: Percentage of an Amount 2

National Curriculum Objectives:

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

Differentiation:

Questions 1, 4 and 7 (Reasoning)

Developing Explain whether or not a method for working out the percentage of an amount is correct. Includes finding multiples of 10%. No conversions.

Expected Explain whether or not a method for working out the percentage of an amount is correct. Includes any multiple of 5% and 10%, with some multiples of 1%. Some conversions included.

Greater Depth Explain a mistake in a calculation and find the correct answer. Includes any percentage, including multiples of 0.5%. Conversions included. Answers may include decimal places.

Questions 2, 5 and 8 (Reasoning)

Developing Explain why a card is the odd one out. Includes finding multiples of 10%. No conversions.

Expected Explain why a card is the odd one out. Includes any multiple of 5% and 10%, with some multiples of 1%. Some conversions included.

Greater Depth Explain why a card is the odd one out. Includes any percentage, including multiples of 0.5%. Conversions included. Answers may include decimal places.

Questions 3, 6 and 9 (Problem Solving)

Developing Solve multiple calculations to find the correct route through a maze. Includes finding multiples of 10%. No conversions.

Expected Solve multiple calculations to find the correct route through a maze. Includes any multiple of 5% and 10%, with some multiples of 1%. Some conversions included.

Greater Depth Solve multiple calculations to find the correct route through a maze. Includes any percentage, including multiples of 0.5%. Conversions included. Answers may include decimal places.

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Percentage of an Amount 2

Percentage of an Amount 2

1a. Melody says,



To find 20% of an amount, you divide the number by 20.

Is Melody correct? Prove it.



R

1b. Arthur says,



To find 70% of an amount, you divide the number by 70.

Is Arthur correct? Prove it.



R

2a. Which is the odd one out?

A

40% of 60

B

50% of 48

C

30% of 50

Explain your reasoning.
Could there be more than one answer?



R

2b. Which is the odd one out?

A

40% of 50

B

50% of 40

C

70% of 90

Explain your reasoning.
Could there be more than one answer?



R

3a. Find a path to the gem by moving horizontally and vertically through the correct answers.

Start	40% of 100 = 40	30% of 60 = 18	50% of 50 = 25
40% of 80 = 50	60% of 40 = 30	10% of 100 = 1	60% of 40 = 24
90% of 80 = 75	10% of 70 = 7	90% of 20 = 18	



PS

3b. Find a path to the gem by moving horizontally and vertically through the correct answers.

Start	50% of 20 = 10	80% of 50 = 40	10% of 100 = 50
50% of 40 = 30	70% of 100 = 7	30% of 10 = 3	80% of 80 = 60
40% of 90 = 36	60% of 60 = 36	70% of 40 = 28	



PS

Percentage of an Amount 2

Percentage of an Amount 2

4a. Libby says,



To find 15% of an amount, you divide the number by 10 and then add 5.

Is Libby correct? Prove it.



R

4b. Raffy says,



To find 5% of an amount, you divide the number by 10 and then divide it by 5.

Is Raffy correct? Prove it.



R

5a. Which is the odd one out?

A

5% of £60

B

26% of £650

C

45% of £80

Explain your reasoning.
Could there be more than one answer?



R

5b. Which is the odd one out?

A

40% of £80

B

28% of £150

C

6% of £40

Explain your reasoning.
Could there be more than one answer?



R

6a. Find a path to the gem by moving horizontally and vertically through the correct answers.

Start	20% of 2m = 40cm	20% of 240 = 48	30% of 180 = 45
19% of 1m = 28cm	86% of 120 = 100	62% of 50 = 31	25% of 140 = 50
30% of 80 = 32	10% of 130 = 13	95% of 140 = 133	



PS

6b. Find a path to the gem by moving horizontally and vertically through the correct answers.

Start	30% of 90 = 30	11% of 110 = 11	25% of 180 = 40
20% of 80 = 16	29% of 3m = 87cm	55% of 100 = 55	35% of 200 = 17
91% of 100 = 91	11% of 300 = 3	30% of 180 = 54	



PS

Percentage of an Amount 2

Percentage of an Amount 2

7a. Selina says,



22% of 2.5m is 5.5cm

Explain Selina's mistake and help her find the correct answer.



R

7b. Max says,



23% of 1.5m is 345cm

Explain Max's mistake and help him find the correct answer.



R

8a. Which is the odd one out?

A

37.5% of £296

B

22% of £450

C

32% of £175

Explain your reasoning.
Could there be more than one answer?



R

8b. Which is the odd one out?

A

18% of £38

B

12.5% of £80

C

17% of £52

Explain your reasoning.
Could there be more than one answer?



R

9a. Find a path to the gem by moving horizontally and vertically through the correct answers.

Start	33% of 9L = 450ml	23% of 50 = 11.5	19% of 600 = 112
37.5% of 300 = 112.5	26% of £72 = £18.72	13% of m = 13cm	44% of 2m = 80cm
98% of £76 = £74.48	37.5% of 200 = 75	22% of £10 = £2.20	



PS

9b. Find a path to the gem by moving horizontally and vertically through the correct answers.

Start	88% of 360ml = 317.8	57% of £28 = £19.96	33% of 170 = 12
11% of 2m = 0.22m	17% of £30 = £5.10	28% of 30 = 8.4	22% of 3m = 66cm
62.5% of 80 = 50	10% of 3m = 6cm	87.5% of £260 = £227.50	



PS

Reasoning and Problem Solving

Percentage of an Amount 2

Developing

1a. Various answers, for example:
Melody is incorrect. To find 20%, first find 10% by dividing the amount by 10, then multiply it by 2 to find 20%. For example, $200 \div 10 = 20 \times 2 = 40$.

2a. Various answers, for example:
C is the odd one out because both A and B are equal to 24; The answer to C is 15 and is an odd number.

3a.

Start	40% of 100 = 40	30% of 60 = 18	50% of 50 = 25
40% of 80 = 50	60% of 40 = 30	10% of 100 = 1	60% of 40 = 24
90% of 80 = 75	10% of 70 = 7	90% of 20 = 18	

Expected

4a. Various answers, for example:
Libby is incorrect. To find 15%, first find 10% by dividing the amount by 10, then divide that amount by 2 in order to find 5%.

Finally, add both 10% and 5% together to find 15%. For example, $200 \div 10 = 20 \div 2 = 10$; $20 + 10 = 30$.

5a. Various answers, for example:
B is the odd one out because both A and C give an amount that is less than £100; The answer to B is £169, whereas the answers to A and C are £3 and £36 respectively.

6a.

Start	20% of 2m = 40cm	20% of 240 = 48	30% of 180 = 45
19% of 1m = 28cm	86% of 120 = 100	62% of 50 = 31	25% of 140 = 50
30% of 80 = 32	10% of 130 = 13	95% of 140 = 133	

Reasoning and Problem Solving

Percentage of an Amount 2

Developing

1b. Various answers, for example:
Arthur is incorrect. To find 70%, first find 10% by dividing the amount by 10, then multiply it by 7 to find 70%. For example, $300 \div 10 = 30 \times 7 = 210$.

2b. Various answers, for example:
C is the odd one out because both A and B are equal to 20; The answer to C is 63 and is an odd number.

3b.

Start	50% of 20 = 10	80% of 50 = 40	10% of 100 = 50
50% of 40 = 30	70% of 100 = 7	30% of 10 = 3	80% of 80 = 60
40% of 90 = 36	60% of 60 = 36	70% of 40 = 28	

Expected

4b. Various answers, for example:
Raffy is incorrect. To find 5%, first find 10% by dividing the amount by 10, then divide that amount by 2 in order to find 5%. For example, $200 \div 10 = 20 \div 2 = 10$.

5b. Various answers, for example:
C is the odd one out because A and B are both equal to an amount over £10; The answer to C is £2, whereas the answers to A and B are £32 and £42 respectively.

6b.

Start	30% of 90 = 30	11% of 110 = 11	25% of 180 = 40
20% of 80 = 16	29% of 3m = 87cm	55% of 100 = 55	35% of 200 = 17
91% of 100 = 91	11% of 300 = 3	30% of 180 = 54	

Reasoning and Problem Solving

Percentage of an Amount 2

Greater Depth

7a. Various answers, for example:
Selina has incorrectly converted from m to cm; she has accidentally found 2.2%. The correct answer is 55cm or 0.55m.

8a. Various answers, for example:
A is the odd one out because both B and C give an that is less than £100; The answer to A is £111, whereas the answers to B and C are £99 and £56 respectively.

9a. Various answers, for example:

Start	33% of 9L = 450ml	23% of 50 = 11.5	19% of 600 = 112
37.5% of 300 = 112.5	26% of £72 = £18.72	13% of 1m = 13cm	44% of 2m = 80cm
98% of £76 = £4.48	37.5% of 200 = 75	22% of £10 = £2.20	

Reasoning and Problem Solving

Percentage of an Amount 2

Greater Depth

7b. Various answers, for example:
Max has incorrectly converted from m to cm; he has accidentally found 230%. The correct answer should be 34.5cm or 0.345m.

8b. Various answers, for example:
B is the odd one out because A and C both give an answer that includes a decimal of 0.84; The answer to B is £10, whereas the answers to A and C are £6.84 and £8.84 respectively.

9b. Various answers, for example:

Start	88% of 360ml = 317.8	57% of £28 = £19.96	33% of 170 = 12
11% of 2m = 0.22m	17% of £30 = £5.10	28% of 30 = 8.4	22% of 3m = 66cm
62.5% of 80 = 50	10% of 3m = 6cm	87.5% of £260 = £227.50	