Reasoning and Problem Solving
Step 9: Percentages as Fractions and Decimals

National Curriculum Objectives:

Mathematics Year 5: (5F11) Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal
Mathematics Year 5: (5F12) Solve problems which require knowing percentage and decimal equivalents of 1/2 , 1/4 , 1/5 , 2/5 , 4/5 and those fractions with a denominator of a multiple of 10 or 25

Differentiation:

Questions 1, 4 and 7 (Problem Solving)
Developing Find the remaining percentage when representing percentages as fractions and decimals. Uses 100 as a denominator and knowledge of hundredths.
Expected Find the remaining percentage when representing percentages as fractions and decimals. Uses 100 and direct multiples of 100 as a denominator e.g. 50/200 and knowledge of hundredths.
Greater Depth Find the remaining percentage when representing percentages as fractions and decimals. Uses denominator which are < 100, 100 or a multiple of 100 and decimals using knowledge of tenths and hundredths.

Questions 2, 5 and 8 (Problem Solving)
Developing Convert fractions and decimals in to percentages and order amounts when representing percentages as fractions and decimals. Uses 100 as a denominator and knowledge of hundredths.
Expected Convert fractions and decimals in to percentages and order amounts when representing percentages as fractions and decimals. Uses 100 and direct multiples of 100 as a denominator e.g. 50/200 and knowledge of hundredths.
Greater Depth Convert fractions and decimals in to percentages and order amounts when representing percentages as fractions and decimals. Uses denominator which are < 100, 100 or a multiple of 100 and decimals using knowledge of tenths and hundredths.

Questions 3, 6 and 9 (Reasoning)
Developing Decide which statement is correct and explain why when representing percentages as fractions and decimals. Uses 100 as a denominator and knowledge of hundredths.
Expected Decide which statement is correct and explain why when representing percentages as fractions and decimals. Uses 100 and direct multiples of 100 as a denominator e.g. 50/200 and knowledge of hundredths.
Greater Depth Decide which statement is correct and explain why when representing percentages as fractions and decimals. Uses denominator which are < 100, 100 or a multiple of 100 and decimals using knowledge of tenths and hundredths.

More Year 5 Decimals and Percentages resources.

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Percentages as Fractions and Decimals

1a. There are 100 glue sticks in a box.

Year 5 takes 20/100 of the glue sticks.
Year 3 takes 40% of the glue sticks.



How many does each year group have?
How many are left in the box?
What percentage is this?

D PS

1b. There are 100 marbles in a jar.

Alice takes 40/100 of the marbles. Cian takes 40% of the marbles.



How many does each child have?
How many are left in the jar?
What percentage is this?

D PS

2a. Convert the fractions and decimals below into percentages.

$\frac{45}{100}$ $\frac{48}{100}$ 0.04 $\frac{47}{100}$ 0.4

Write the percentages in descending order.

D PS

2b. Convert the fractions and decimals below into percentages.

0.5 $\frac{5}{100}$ $\frac{55}{100}$ $\frac{15}{100}$ 0.25

Write the percentages in ascending order.

D PS

3a. Johnny and Alice are converting fractions and decimals into percentages.



Johnny: 0.05 as a percentage is 50%.

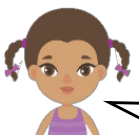


Alice: $\frac{5}{100}$ as a percentage is 5%.

Who is correct?
Explain how you know.

D R

3b. Isabel and Cian are converting fractions and decimals into percentages.



Isabel: 0.25 as a percentage is 25%.



Cian: $\frac{25}{100}$ as a percentage is 25%.

Who is correct?
Explain how you know.

D R

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Percentages as Fractions and Decimals

4a. There are 200 sweets in a jar.

Lucy takes 3/10 of the sweets. Alice takes 50% of the sweets.



How many does each child have?
How many are left in the jar?
What percentage is this?

E

PS

4b. There are 100 pencils in a box.

Class 5 takes 4/10 of the pencils. Class 4 takes 25% of the pencils.



How many does each class have?
How many pencils are left in the box?
What percentage is this?

E

PS

5a. Convert the fractions and decimals below into percentages.

$\frac{22}{200}$ $\frac{58}{100}$ 0.5 $\frac{30}{300}$ 0.15

Write the percentages in ascending order.

E

PS

5b. Convert the fractions and decimals below into percentages.

0.7 $\frac{72}{100}$ $\frac{148}{200}$ $\frac{75}{300}$ 0.75

Write the percentages in descending order.

E

PS

6a. Steph and Gabriel are converting fractions and decimals into percentages.



Steph

0.07 as a percentage is 70%.



Gabriel

$\frac{70}{100}$ as a percentage is 70%.

Who is correct?
Explain how you know.

E

R

6b. Hannah and Sean are converting fractions and decimals into percentages.



Hannah

0.5 as a percentage is 50%.



Sean

$\frac{50}{200}$ as a percentage is 50%.

Who is correct?
Explain how you know.

E

R

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Percentages as Fractions and Decimals

7a. There are 30 chocolate bars in one box and 20 in the other.
Bill's Shop sells 5/25 of the bars. Jack's Store sells 50% of the bars.





How many does each owner sell?
How many are left to sell?
What percentage is this?

GD

PS

7b. There are 125 sweets in each sweet jar. Sean and Ben take 1/5 of the sweets each. Steph takes 24% of the sweets.



How many does each child have?
How many sweets are left in the jars?
What percentage is this?

GD

PS

8a. Convert the fractions and decimals below into percentages.

$\frac{20}{25}$ $\frac{36}{50}$ 0.52 $\frac{96}{300}$ 0.75

Write the percentages in descending order.

GD

PS

8b. Convert the fractions and decimals below into percentages.

0.92 $\frac{180}{200}$ $\frac{48}{50}$ $\frac{22}{25}$ 0.8

Write the percentages in ascending order.

GD

PS

9a. Kelly and Josh are converting fractions and decimals into percentages.



Kelly: 0.36 as a percentage is 36%.



Josh: $\frac{9}{25}$ as a percentage is 36%.

Who is correct?
Explain how you know.

GD

R

9b. Lucy and Ben are converting fractions and decimals into percentages.



Lucy: 0.8 as a percentage is 8%.



Ben: $\frac{20}{25}$ as a percentage is 80%.

Who is correct?
Explain how you know.

GD

R

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Reasoning and Problem Solving Percentages as Fractions and Decimals

Developing

1a. Year 5 have 20 glue sticks, Year 3 have 40 glue sticks. There are 40 glue sticks left which is 40%.

2a. 48%, 47%, 45%, 40%, 4%

3a. Alice is correct $\frac{5}{100}$ = 5%. Johnny is incorrect, 0.05 = 5% not 50%

Expected

4a. Lucy has 60 sweets, Alice has 100 sweets. There are 40 sweets left which is 20%.

5a. 10%, 11%, 15%, 50%, 58%

6a. Gabriel is correct, $\frac{70}{100}$ = 70%. Steph is incorrect, 0.07 = 7% not 70%

Greater Depth

7a. Bill's sells 10 bars. Jack's sells 25 bars. There are 15 bars left which is 30%.

8a. 80%, 75%, 72%, 52%, 32%

9a. They are both correct. 0.36 = $\frac{9}{25}$ = 36%.

Reasoning and Problem Solving Percentages as Fractions and Decimals

Developing

1b. Alice has 40 marbles, Cian has 40 marbles. There are 20 marbles left which is 20%.

2b. 5%, 15%, 25%, 50%, 55%

3b. They are both correct. 0.25 = $\frac{25}{100}$ = 25%.

Expected

4b. Class 5 have 40 pencils. Class 4 have 25 pencils. There are 35 pencils left which is 35%.

5b. 75%, 74%, 72%, 70%, 25%

6b. Hannah is correct, 0.5 = 50%. Sean is incorrect, $\frac{50}{200}$ = 25% not 50%.

Greater Depth

7b. Sean and Ben both have 50 sweets each. Steph has 60 sweets. There are 90 sweets left which is 36%.

8b. 80%, 88%, 90%, 92%, 96%

9b. Ben is correct, $\frac{20}{25}$ = 80%. Lucy is incorrect, 0.8 = 80% not 8%.

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