Per Cent Means Per 100

Teacher		**Class**	Year 5
Subject	Maths	**Topic**	Percentages
Date		**Room**	
Lesson length	60 minutes	**Country**	United Kingdom

Pupils learn that per cent means parts per 100. They shade 100-grids and write per cents as fractions over 100 and decimals.

Curriculum links

- 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 [2]

Learning objectives

- Students will recognise the % symbol and explain per cent as parts per 100.
- Students will write any whole-number per cent as a fraction with denominator 100.
- Students will write any whole-number per cent as a decimal fraction.

Success criteria

- I can say what % means using parts per 100.
- I can write a per cent as a fraction over 100.
- I can write a per cent as a decimal.

What students already know

Show 71/100 on a 100-grid and 0.71 on a place-value chart. Ask: how many parts out of 100 are shaded, and how do we write 71 hundredths as a decimal?

Key words

per cent	out of every 100 equal parts, shown with the sign % [1]
fraction	a number with a top and bottom that shows equal parts of a whole [2]
decimal	a number with a point that shows tenths and hundredths, like 0.45 [2]
hundredth	one equal part when a whole is cut into 100 parts [1]

Materials

- blank 10 by 10 grids on paper, one per pupil plus spares
- coloured pencils and rulers
- mini whiteboards and pens
- Slides 1-12 with projector
- Worksheet Task B copies for main activity

Before the lesson

- Print blank 100-squares, one per pupil plus spares, and Worksheet Task B copies
- Test Slide 6 Video clip 1 (0:00-2:28) for sound and picture
- Set out coloured pencils, whiteboards and have Slide 1 ready

Lesson outline

0–5 min **Starter** 5 min · Whole class

To hook pupils and link the % sign to their everyday experience.

YOU DO

1. Show Slide 1 Per Cent Means Per 100! Write % as fractions and decimals and read the title together.
2. Pose the hook: If I coloured in 37 tiny boxes out of 100, how many clever ways could we write that down?
3. Show Slide 2 Have you seen % before? and run the vote: battery or download bar, shop price label, sports or game score, I have not seen it.
4. Take 3 quick answers and say today we will learn all three clever ways.

STUDENTS DO

1. Vote with hands for where they have seen % before.
2. Tell a partner one place they saw % and what they think it meant.

Say: If I coloured in 37 tiny boxes out of 100, how many clever ways could we write that down? Think where you have seen this sign % before. By the end today you will write it three ways.

Ask: Where have you seen the % sign before? (On a battery bar, download bar or shop price label.) · What do you think 37 out of 100 could tell us? (How many parts are coloured out of 100 parts altogether.)

Check understanding: Hands-up vote on Slide 2; if few have seen %, show a battery picture and move on.

Support: Let pupils who have not seen % point to the % on Slide 2 and trace it in the air. **Stretch:** Ask confident pupils to guess how to write 37 out of 100 as a fraction.

Use: Slides 1–2

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5–17 min **Teaching** 12 min · Whole class

To teach that % means parts per 100 and model % as /100 and decimal.

YOU DO

1. Show Slide 3 Same size, different sign and compare 9% with 9/100: both mean 9 parts per 100 [1].
2. Show Slide 4 From words to numbers chain: per cent means per 100, 23% means 23 parts per 100, 23% = 23/100, 23/100 = 0.23.
3. Model writing 23% = 23/100 = 0.23 on a large 100-square, counting 2 full rows of 10 plus 3.
4. Show Slide 7 Big idea: Per cent is just counting how many parts per 100.

STUDENTS DO

1. Chant with teacher: per cent means per 100.
2. Copy 23% = 23/100 = 0.23 on whiteboards and hold up.

Say: Per cent relates to number of parts per hundred [2]. It is defined as number of parts per hundred [1]. So we always put the number over 100, and hundredths as a decimal use two places after the point.

Worked example: 23% means 23 parts per 100. Step 1: write 23 over 100 = 23/100, because percentages are written as a fraction with denominator 100 [2]. Step 2: write as hundredths = 0.23, because 23/100 = 0.23. So 23% = 23/100 = 0.23.

Ask: What does the % in 23% tell us? (23 parts per 100 [1].) · Why is the bottom number always 100? (Because per cent relates to number of parts per hundred [2].) · How do we write 23/100 as a decimal? (0.23, two decimal places for hundredths.)

Check understanding: All hold up whiteboards showing 23% = 23/100 = 0.23; re-model shading if many show 23/10 or 0.23 mixed up.

Support: Keep to 9% = 9/100 = 0.09 on a 100-square and count the 9 squares aloud. **Stretch:** Ask what 100% would be as a fraction and decimal: 100/100 = 1.00.

Use: Slides 3–4, 7

17–27 min **Shared practice** 10 min · Whole class

To practise reading a 100-grid together and confirm what makes one whole.

YOU DO

1. Show Slide 5 Think, pair, share question: A grid has 100 small squares. 63 are coloured. What is the per cent, fraction and decimal coloured?
2. Give 30 seconds think, 1 minute pair talk, then take answers.
3. Play Slide 6 Video clip 1 per cent means per 100 and ask pupils to count how many parts make one whole.

STUDENTS DO

1. Think then tell a partner: 63% = 63/100 = 0.63.
2. Watch the video and count to 100 with the class.

Say: Look at the grid. Count the coloured parts out of 100. Tell your partner the per cent, then the fraction over 100, then the decimal. Listen for what per cent means while we watch.

Worked example: 63 squares coloured out of 100. Step 1: per cent = 63%. Step 2: fraction = 63/100. Step 3: decimal = 0.63. So 63% = 63/100 = 0.63.

Ask: 63 squares are coloured out of 100. What is that as a per cent, fraction and decimal? (63% = 63/100 = 0.63.) · How many parts make one whole grid? (100 parts make one whole [2].)

Check understanding: Whiteboard show of 63% = 63/100 = 0.63; if split, shade 63 on the board grid and recount in tens.

Support: Give a 100-square to colour while counting to 63 in tens: 10, 20, 30. **Stretch:** Ask what is left uncoloured as % , fraction and decimal: 37% = 37/100 = 0.37.

Use: Slides 5–6, Video clip 1 (0:00–2:28)

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27–50 min **Main activity** 23 min · Pairs

To shade per cents and write each as a fraction over 100 and decimal.

YOU DO

1. Hand out blank 10 by 10 grids, coloured pencils and whiteboards for the Shade the Hundred activity.
2. Model one: shade 45 squares, then write underneath 45% = 45/100 = 0.45, because percentages can be written as a fraction with denominator 100, and as a decimal [2].
3. Show Slide 9 Your task and set pairs to shade squares for 4%, 25%, 50% and 81% and write % , fraction over 100, decimal for each.
4. Circulate, then give Worksheet Task B to record each percentage as a fraction with denominator 100 and as a decimal.

STUDENTS DO

1. In pairs, shade 100-squares for 4%, 25%, 50% and 81% and label each % = /100 = decimal.
2. Hold up a shaded grid and read all three forms to partner, then complete Worksheet Task B.

Say: Per cent relates to number of parts per hundred [2]. Shade that many squares out of 100. Then write all three ways underneath. Hold up and read all three forms to your partner: per cent, fraction and decimal.

Worked example: 45% : shade 4 full rows of 10 = 40 plus 5 = 45 squares. Write 45% = 45/100 = 0.45. Read aloud: forty-five per cent equals forty-five out of one hundred equals zero point four five.

Ask: You shaded 25 squares. How do you write that three ways? (25% = 25/100 = 0.25.) · How do you check with your partner that 25% = 25/100 = 0.25? (Count 25 shaded squares out of 100 and match all three numbers.)

Check understanding: Partners check counts and number sentences; teacher spots two grids and checks 25% = 25/100 = 0.25 before Task B.

Support: Start only with multiples of 10, like 10%, 30%, 70%, and count squares in tens before writing 30% = 30/100 = 0.30 [2]. **Stretch:** Shade and write two per cents that add to 100%, for example 60% and 40%, and prove it with fractions out of 100.

Use: Slide 9, Worksheet Task B

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50–60 min **Plenary** 10 min · Whole class

To use key equivalents and prove the three ways match.

YOU DO

1. Show Slide 10 One amount, three ways cards: 50% equals 50/100 and 0.50, half of the whole; 25% equals 25/100 and 0.25, a quarter of the whole; 10% equals 10/100 and 0.10.
2. Show Slide 11 mystery: A tablet shows 87% charged. What does 87% tell us? Agree 87 parts per 100 charged: 87/100 = 0.87.
3. Show Slide 12 Exit ticket and ask pupils to write 23% as a fraction over 100 and as a decimal plus one thing learnt.

STUDENTS DO

1. Read the three cards aloud with the class and say half and quarter links.
2. Complete exit ticket on whiteboards: 23% = 23/100 = 0.23.

Say: Fifty per cent is half the whole: 50% = 50/100 = 0.50. Twenty-five per cent is a quarter. If a tablet shows 87% charged, it means 87 parts per 100 are charged. Now prove you can write 23% three ways.

Worked example: 87% charged means 87 parts per 100 charged [3]. So 87% = 87/100 = 0.87. Shade 87 squares on a 100-square to prove it.

Ask: What does 87% charged tell us? (87 parts per 100 charged, 87/100 = 0.87.) · How is 50% linked to one half? (50% = 50/100 = 0.50, which is half of the whole.)

Check understanding: Whiteboard exit tickets held up; if errors, re-show 23% = 23/100 = 0.23 on the 100-square.

Support: Let pupils copy 50% = 50/100 = 0.50 from Slide 10 while answering. **Stretch:** Ask pupils to explain what 100% full and 0% full would look like on the same diagram.

Use: Slides 10–12

Common mistakes

Mistake	How to spot it	How to fix it
Writing 9% as 0.9 or 9/10, mixing up tenths and hundredths.	Decimal has one place or fraction shows /10 for a per cent under 10.	Count 9 squares out of 100 on the grid to show 9% = 9/100 = 0.09, because per cent relates to number of parts per hundred [2].
Thinking 9% and 90% are the same.	Pupil shades 9 rows instead of 9 squares for 9%.	Shade both on two grids and read aloud: 9 parts per 100 is 9% = 9/100 = 0.09, 90 parts per 100 is 90% = 90/100 = 0.90 [1].
Writing 70% as 7/100 = 0.07, missing the zero.	Fraction or decimal does not match the count of 70 squares.	Count in tens to 70 and match digits: 70% = 70/100 = 0.70, using multiplication and division by 100 to interchange [3].

Support

- Start only with multiples of 10, like 10%, 30%, 70%, and count squares in tens before writing 30% = 30/100 = 0.30.

Stretch

- Shade and write two per cents that add to 100%, for example 60% and 40%, and prove it with fractions out of 100.

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For the LSE or teaching assistant

Sit with target pairs in main activity; help count squares in tens, point to 45% = 45/100 = 0.45 model, and prompt reading aloud of all three forms.

Check for understanding

Question	Answer
What does the % sign tell us?	Number of parts per 100.
Write 23% as a fraction with denominator 100.	23/100.
Write 23% as a decimal.	0.23.

Homework

In your jotter write 17%, 50% and 81% each as a fraction over 100 and as a decimal.

Sources

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