Tenths and Hundredths as Decimals

Teacher		**Class**	Year 4
Subject	Maths	**Topic**	Tenths and hundredths as decimals
Date		**Room**	
Lesson length	60 minutes	**Country**	United Kingdom

Pupils learn to recognise and write any number of tenths or hundredths as decimals. They colour grids, match fractions to decimals and use money and measures.

Curriculum links

- recognise and write decimal equivalents of any number of tenths or hundredths [1]
- count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10 [2]
- solve simple measure and money problems involving fractions and decimals to 2 decimal places [1]

Learning objectives

- Students will recognise tenths as fractions and write them as decimals.
- Students will recognise hundredths as fractions and write them as decimals.
- Students will explain how tenths and hundredths are linked using diagrams.

Success criteria

- I can read 0.6 as six tenths and write 6/10 as 0.6.
- I can write 45/100 as 0.45 and say forty-five hundredths.
- I can show 10/100 is the same as 1/10 on a grid.

What students already know

Show 1 whole cut into 10 equal parts. Ask: What do we call one part? Listen for one tenth, 1/10. Ask: What if we cut each tenth into 10?

Key words

tenth	one equal share when a whole is cut into ten equal shares [2]
hundredth	one tiny equal share when a whole is cut into one hundred equal shares [2]
decimal point	the dot that separates whole ones from shares smaller than one [1]
decimal	a short way of writing shares smaller than one using a dot [1]
place value	how much a digit is worth by where it stands in a number [1]
fraction	a way to show equal shares of a whole, like 3/10 [2]

Materials

- Slides 1–11 and whiteboard
- Video clip 1 (0:00–3:33) on Slide 5 and Video clip 2 (0:00–2:36) on Slide 7
- 10 x 10 hundred squares on paper

Before the lesson

- Print 10 x 10 hundred squares, one 10-strip per pair and Worksheet Task B.
- Test Slides 1–11 and sound for Video clip 1 (0:00–3:33) and Video clip 2 (0:00–2:36).

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- coloured pencils
- rulers
- mini whiteboards and pens
- Worksheet Task B copies

- Set out coloured pencils, rulers and mini whiteboards.
- Pre-shade one hundred square with 20 squares for support and one example poster.

Lesson outline

0–8 min **Starter** 8 min · Whole class

Connect decimals to everyday life and introduce hundredths with a hook.

YOU DO

1. Show Slide 1 title and Slide 2 objectives and read the I can statements together.
2. Show Slide 3 photo and point out shop prices like £1.25 and a metre stick marked in centimetres.
3. Use the hook and ask pupils to whisper ideas to their partner about one coloured square.
4. Collect ideas and confirm we can write it as 1/100 and as 0.01.

STUDENTS DO

1. Look at Slides 1–3 and read the objectives aloud.
2. Whisper to a partner what one square out of 100 could be called.
3. Share ideas that one square is one out of a hundred.

Say: Today we will write tenths and hundredths in a new way called decimals. If I had 100 tiny squares and I coloured just one, how could we write that tiny bit as a fraction and as a decimal? Whisper to your partner, then we will find out together.

Ask: Where do we see decimals in real life? (On shop prices like £1.25 and on a metre stick in centimetres.) · If one whole strip is cut into 10 equal parts, what is one part? (One tenth, written 1/10.) · If one whole is cut into 100 equal parts, what is one part? (One hundredth, written 1/100, which is 0.01.)

Check understanding: Ask all to hold up fingers to show how many parts make a whole: 10 tenths or 100 hundredths. If unsure, show the 10-strip and 100-grid side by side.

Support: Show a 10-strip with 1 part shaded and label 1/10, then show a 100-grid with 1 square shaded.
Stretch: Ask what 10 squares out of 100 might also be called in tenths.

Use: Slides 1–3

8–20 min **Teaching - tenths** 12 min · Whole class

Model how to write any number of tenths as a decimal.

YOU DO

1. Show Slide 4 statement and point to ones, decimal point and tenths on a place value grid [1].
2. Play Video clip 1 (0:00–3:33) on Slide 5 and ask pupils to listen for how 3/10 becomes 0.3.
3. Model 3/10 on a 10-strip, counting 1 tenth, 2 tenths, 3 tenths.
4. Show Slide 6 steps and write ones, dot, then tenths, using 0 to hold empty ones.

STUDENTS DO

1. Watch the clip and spot where tenths sit after the dot.
2. Choral read 1/10 = 0.1 up to 9/10 = 0.9 with the teacher.
3. Write 7/10 = 0.7 on mini whiteboards and hold up.

Say: Decimals and fractions are different ways of expressing numbers and proportions [2]. Count the tenths first. Write 0 ones, put the dot, then put the number of tenths after it. So three tenths is 3/10 is 0.3.

Worked example: Write 3/10 as a decimal. Step 1: count tenths = 3. Step 2: write 0 for ones. Step 3: write decimal point. Step 4: write 3 in the tenths place = 0.3, read as three tenths.

Ask: How do we write 3/10 as a decimal? (0.3, zero point three, three tenths.) · Where does the 7 go in 0.7, and what holds the ones place? (7 goes in the tenths place just after the dot; 0 holds the ones.) · What is 10/10 as a decimal? (1.0, one whole.)

Check understanding: Mini whiteboards: show decimal for 4/10 and 9/10. Reteach with the 10-strip if many show 0.04 or 0.09.

Support: Leave a completed strip showing 1/10 = 0.1 to 9/10 = 0.9 on desks for copying and matching.
Stretch: Write and order 1 and 3/10 = 1.3 and 2 and 6/10 = 2.6.

Use: Slides 4–6, Video clip 1 (0:00–3:33)

20–40 min **Main activity - hundred squares** 20 min · Pairs

Colour and label hundred squares to write any number of hundredths as decimals.

YOU DO

1. Show Slide 7 and play Video clip 2 (0:00–2:36), asking pupils to listen for saying 0.23 as twenty-three hundredths.
2. Demonstrate with a large 100-grid: colour 4 squares and write 4/100 = 0.04, then 23 squares and write 23/100 = 0.23 [1].
3. Show one full row of 10 and write 10/100 = 0.10 which is the same as 1/10 = 0.1, because hundredths arise when dividing an object by 100 and dividing tenths by 10 [2].
4. Show Slide 8 task, give out grids, pencils and rulers, and set pairs to colour, write and read aloud.

STUDENTS DO

1. Colour squares to show given fractions, e.g. 4 squares and 35 squares.
2. Label each picture, for example 35/100 = 0.35, and read it aloud to a partner.
3. In pairs, match fraction cards to decimal cards and order them smallest to largest.

Say: One square is one hundredth. Count the squares you colour, write the fraction out of 100, then write the decimal with tenths first and hundredths next. Use 0 to hold an empty place, so 4 hundredths is 0.04, not 0.4.

Worked example: Colour 23 squares. Step 1: count = 23 hundredths = 23/100. Step 2: 0 ones. Step 3: 2 in tenths, 3 in hundredths. Step 4: write 0.23, read as twenty-three hundredths.

Ask: How do we write 4 squares out of 100 as a fraction and decimal? (4/100 = 0.04, zero point zero four.) · Why is 10/100 the same as 1/10? (One row of 10 out of 100 is one tenth; 10/100 = 0.10 = 0.1.) · What is the difference between 0.3 and 0.03? (0.3 is 3 tenths; 0.03 is 3 hundredths and needs two places after the dot.)

Check understanding: Pairs display squares with both writings underneath, e.g. 35/100 = 0.35, and explain how they counted. Correct zero-placeholder errors on a place value grid.

Support: Start with multiples of 10 squares only, such as 20/100 = 0.20, to connect hundredths to tenths and place value and decimal measure [1]. **Stretch:** Colour and write three linked equivalents, such as 30/100 = 3/10 = 0.3.

Use: Slide 7, Video clip 2 (0:00–2:36), Slide 8

40–50 min **Apply - worksheet** 10 min · On their own

Practise writing tenths and hundredths as decimals independently.

YOU DO

1. Hand out Worksheet Task B and read the first two questions together.
2. Model one tenth and one hundredth side by side on a place value grid: 6/10 = 0.6 and 6/100 = 0.06.
3. Set pupils to complete Task B quietly, reminding them to count tenths or hundredths first.
4. Circulate, mark two items live and prompt self-correction using the grid.

STUDENTS DO

1. Complete Worksheet Task B, writing tenths and hundredths as decimals.
2. Read each decimal quietly as tenths or hundredths to check.
3. Tick finished answers and fix any with the place value grid.

Say: Look if it is tenths or hundredths before you write. Tenths need one place after the dot, hundredths need two places. Check by reading it back: does 0.06 sound like six hundredths?

Worked example: 6/10 = 0.6 because 6 is in the tenths place. 6/100 = 0.06 because 0 holds the tenths and 6 is in the hundredths place.

Ask: How do you write 7 tenths as a decimal? (0.7.) · How do you write 7 hundredths as a decimal? (0.07, with 0 in the tenths place.)

Check understanding: Collect books and scan three answers; if many mix 0.7 and 0.07, redo with grids on the board before plenary.

Support: Give a ones-tenths-hundredths grid and digit cards to build each number before writing it [1]. **Stretch:** Add Task F comparison if finished: write <, > or = for 0.6 and 0.60.

Use: Worksheet Task B

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

Link decimals to money and measures and check the objectives.

YOU DO

1. Show Slide 9 fact and write 1p as £0.01 and 1 cm as 0.01 m with the class.
2. Show Slide 10 vote and ask which picture shows 0.36 best: 100-grid, number line or 36p out of £1.00.
3. Show Slide 11 quick quiz and take answers on whiteboards for 0.4, 0.23, 9/100 and 0.5 or 0.35.
4. Return to Slide 2 I can statements and ask pupils to show thumbs for each.

STUDENTS DO

1. Vote for the picture that shows 0.36 best and explain choice to a partner.
2. Answer the quiz on whiteboards and read decimals aloud as tenths and hundredths.
3. Self-assess against I can read 0.6 and I can write 0.45 statements.

Say: Money uses hundredths daily, just like 1 cm is 0.01 m. One pence is one hundredth of a pound, so 43p is £0.43, which is 43/100 of a pound. Tell your partner which picture helped you most and why.

Worked example: 43p = £0.43 = 43/100 of a pound. 5 cm = 5/100 m = 0.05 m. 0.5 is bigger than 0.35 because 5 tenths is 50 hundredths.

Ask: What fraction of a pound is £0.09? (9/100, nine hundredths.) · Which is bigger: 0.5 or 0.35, and how do you know? (0.5 is bigger; 0.5 = 50/100 which is more than 35/100.) · How do you write 1 cm as a decimal of a metre? (0.01 m, one hundredth of a metre.)

Check understanding: Quick quiz on whiteboards for all four quiz items; reteach any with <70% correct using the 100-grid tomorrow.

Support: Use a hundred square with a £ sign to count pence as hundredths, shading the pence and reading the decimal. **Stretch:** Add £0.24 + £0.15 and write the total as pence and pounds.

Use: Slides 9–11

Common mistakes

Mistake	How to spot it	How to fix it
Writing 3/10 as 0.03 by adding an extra zero.	Pupil reads 0.3 as zero point zero three or writes two places for tenths.	Build on a ones-tenths-hundredths grid [1]; tenths need one place after the dot, hundredths need two.
Writing 40/100 as 4.0	Pupil misses that 40/100 = 0.40, which does equal 0.4, but writes 4.0.	Show 40 shaded squares is 4 full rows; write 40/100 = 0.40 = 0.4 on the grid and number line.
Mixing 0.5 and 0.05 or 0.13 and 0.31.	Pupil cannot say which digit is tenths and which is hundredths when reading aloud.	Practise saying decimal numbers as fractions, for example 0.71 = 71/100 [1], and point to each place.

Support

- Start with multiples of 10 squares only, such as 20/100 = 0.20, to link hundredths to tenths.
- Keep a completed 10-strip and place value grid on desks for copying.

Stretch

- Colour and write three linked equivalents, such as 30/100 = 3/10 = 0.3.
- Order mixed numbers with tenths, such as 1.3 and 2.6, on a number line.

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- Use pence on a £100-grid to count hundredths in money.
- Make a tricky pair for a partner, such as 0.13 and 0.31, and explain the difference.

For the LSE or teaching assistant

Stay with the support table during the main activity. Help shade multiples of 10 first, build 0.04 and 0.40 with digit cards, and prompt pupils to read each as tenths or hundredths aloud.

Check for understanding

Question	Answer
Write 4 tenths as a decimal.	0.4
Write 23 hundredths as a decimal.	0.23
What fraction is 0.09?	9/100, nine hundredths

Homework

Write three prices in pence as pounds, e.g. 7p, 36p and 52p.

Sources

1. National curriculum in England: mathematics programmes of ... · gov.uk · https://www.gov.uk/government/publications/national-curriculum-in-england-mathematics-programmes-of-study/national-curriculum-in-england-mathematics-programmes-of-study
2. Year 4 mathematics new curriculum on a page · holtsmerejm.herts.sch.uk · https://www.holtsmerejm.herts.sch.uk/wp-content/uploads/2020/07/Yr-4-Maths-Curriculum.pdf

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