Lesson 3 NUMBER

Modelling thousandths with concrete and visual tools

CURRICULUM ALIGNMENT

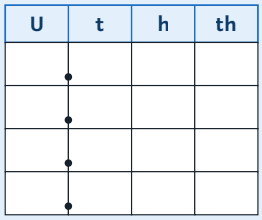
NUM.PVT.4 investigate how decimals and percentages (and fractions) can be compared, ordered and expressed in related terms.

NUM.FRC.4a explore (model, compare and convert) the relationships between fractions, decimals and percentages.

INTERACTIVES Place Value Blocks (Dienes) · challenge, display, explore

WHAT THIS LESSON TEACHES

A **thousandth** is one of **1000 equal parts**. Splitting a whole into ten, then ten again, then ten again gives tenths, hundredths and thousandths.



→ If a flat (10×10 square) is **1**, one small cube is **0.001**.

→ **1 mm** is **0.001** of a metre, because a metre is 1000 mm.

LESSON ARC

Open with three relabelled base-ten sets already on the IWB and take three hands-up readings — but don't confirm. In Watch and Notice, build 0.003, 0.034, 0.207 and 1.045 on the place-value-blocks interactive, pointing column by column and saying the holding zero aloud. Pupils take turns building decimals at the board, then sketch the four columns (U, t, h, th) for four decimals in their copies. The Class Challenge bank consolidates with holding-zero traps; Student Activity Book follows.

TEACHING MOVES

1. **Getting Started.** Have the three relabelled-block sets up as pupils settle. Take exactly three hands-up readings — not open call-outs — and resist confirming any of them. The hold-back is deliberate; the answers get checked in Watch and Notice.
2. **Watch and Notice.** Build each decimal on the interactive one at a time, pointing at every column. On 0.034 name it 'three hundredths and four thousandths', never 'thirty-four'. 0.207 is the trap — say the zero aloud and point at the holding-zero definition so nobody reads it as 0.27.
3. **Ten Times Smaller Each Step.** Collect ten smallest cubes on the board so pupils see them match one hundredth cube, then ten hundredths matching one tenth rod. Say the chain aloud — 'tenth, hundredth, thousandth, each ten times smaller' — then close with 'ten times ten times ten makes a thousand' so they can rebuild it in the maths-talk.
4. **Try It Together.** Call five or six decimals that stretch the holding zeros — 0.006, 0.012, 0.205, 1.030, 0.090, 2.003. A pupil builds, the whole class reads the in-words readout aloud, then agrees or corrects before you confirm. When a zero appears, pause and ask 'which column is empty here, and what is keeping it open?'

5. **Sketch the Columns in Your Copy.** Walk the room glancing at two things: the column labels U/t/h/th and the holding zero in 0.207. Watch for pupils who draw the blocks but forget to write the matching decimal beside each drawing — that pairing is the point.
6. **Class Challenge.** Keep board work brisk — pupils build, hit Check, class confirms, move on. Before each build ask 'which columns are empty here?'. On 0.306 say 'three tenths, no hundredths, six thousandths' to head off the read-as-0.36 slip.
7. **What Did We Notice?.** Listen for pupils linking the three steps they watched into 'ten times ten times ten'. Revoice a strong answer: 'so it takes ten thousandths to make one hundredth, and a hundred thousandths to make one tenth'. Head off the idea that a longer decimal is always a bigger number.

COMMON MISCONCEPTIONS

⚠ Pupils read 0.207 as 'nought point twenty-seven' or build it with no hundredths gap, ignoring the holding zero entirely.

Build 0.207 and 0.27 side by side on the interactive so the empty hundredths column is visible. Point at the gap: 'the zero is holding this column open — drop it and the seven slides into the wrong place.' Have the pupil read each digit by its column name.

⚠ Pupils say 0.034 is 'thirty-four thousandths' but write it as a bigger number, or assume a longer decimal is always worth more (0.034 > 0.2).

Put both on the relabelled blocks — three hundredth cubes plus four smallest cubes against two tenth rods. The two rods are visibly more material. 'More digits doesn't mean more value — it's the column that decides.'

⚠ When asked how a thousandth relates to a whole, pupils guess 'a hundred times smaller' — they lose one of the three steps down.

Rerun the regrouping chain on the board: ten thousandths into one hundredth, ten hundredths into one tenth, ten tenths into one whole. Count the steps with the class — three steps, ten each time, ten × ten × ten.

DIFFERENTIATION

EMERGING

- Pre-draw the four column headings U/t/h/th in the copy so pupils only place the blocks and digits, not invent the grid structure.
- On the IWB builds, stay with tenths and hundredths only (0.2, 0.03) for these pupils while the class moves to thousandths; bring the thousandths cube in once the holding zero is secure.

DEVELOPING

- After a board build, ask pupils to rewrite the decimal as a count — 0.034 is 'thirty-four thousandths' — and check it matches the blocks on screen.
- Pose a missing-column puzzle: 'I built two tenths and six thousandths, no hundredths — what's my decimal?' before they reach the Class Challenge.

PROFICIENT

- Teacher-narrated stretch at the board: 'order 0.09, 0.102 and 0.1 from smallest to largest and justify it by the columns, not the number of digits.'
- Send fast finishers ahead into the Student Activity Book page, asking them to write one sentence explaining to a younger pupil why 0.207 is not the same as 0.27.

Cross-curricular: Tie to PE — time a 60 m sprint on a stopwatch reading to thousandths of a second and read the result aloud column by column.

ANSWER KEY

Warm-up: a) 9 (tenths digit of 2.9) b) 9 (tenths digit of 2.9) c) 5 (tenths digit of 8.5) d) 9 (tenths digit of 6.9)

Q1: $5.71 = 5 + 0.7 + 0.01$

Q2: $8.32 = 8 + 0.3 + 0.02$

Q3: between 3 and 4, closer to 3

Q4: between 3 and 4, closer to 3

EXTENSION SHEET · STRETCH ANSWERS

S1: between 4 and 5, closer to 4

S2: $6.96 = 6 + 0.9 + 0.06$

S3: $2.52 = 2 + 0.5 + 0.02$