

Equivalent fractions, decimals, percents: independent

CURRICULUM ALIGNMENT

NUM.FRC.4a

explore (model, compare and convert) the relationships between fractions, decimals and percentages.

NUM.PVT.4

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

INTERACTIVES **Phone Battery · challenge, display, explore**

WHAT THIS LESSON TEACHES

The same amount can be written three ways: as a fraction, a decimal and a percentage. $\frac{1}{2}$, 0.5 and 50% are all the same amount.

$$\rightarrow \frac{3}{4} = 0.75 = 75\%$$

$$\rightarrow \frac{1}{8} = 0.125 = 12.5\%$$

MODEL THIS ON THE BOARD

EQUIVALENTS FOR $\frac{3}{5}$

- 1 Begin with the fraction $\frac{3}{5}$.
- 2 Divide 3 by 5 to find the decimal: 3 divided by 5 = **0.6**.
- 3 Multiply the decimal by 100 to find the percent: $0.6 \times 100 = \mathbf{60\%}$.
- 4 So $\frac{3}{5} = 0.6 = 60\%$.

LESSON ARC

Open with the row $\frac{1}{8} = ? = ?$ on the IWB and take two or three predicted answers before revealing 0.125 and 12.5%. Model four rows on the phone-battery equivalence slider, pausing on $\frac{1}{3}$ to show the returning remainder that makes it run on. Pupils predict then check $\frac{3}{5}$, $\frac{1}{4}$, $\frac{9}{10}$ and the new $\frac{1}{6}$ together, then complete five equivalence rows in their maths copy before the Class Challenge bank works given-form-to-the-other-two.

TEACHING MOVES

1. **Getting Started.** Put the row $\frac{1}{8} = ? = ?$ on the board and give five seconds of quiet think-time. Take two or three hands-up predictions, not open call-outs, and frame it as a guess — don't confirm the answer, the next step reveals it.
2. **Watch and Notice.** Walk each row aloud one at a time on the equivalence slider. On $\frac{1}{3}$, do the short division on the board and pause on the returning remainder so the class sees why it never stops — this is the planned pause. On $\frac{2}{5}$, take a prediction, then show the remainder reaching zero: the contrast with $\frac{1}{3}$ is the whole point.
3. **Try It Together.** For each value the whole class predicts the decimal and percent, then a named pupil drags the slider to check and the class agrees or corrects out loud. Save $\frac{1}{6}$ for last as the wrinkle; divide $1 \div 6$ briefly on the board and revoice: 'so $\frac{1}{6}$ is like $\frac{1}{3}$ — the remainder keeps coming back and it never quite stops.'
4. **Complete the Row in Your Copy.** Walk the room glancing for the two missing forms and the underline on each row — this is practice, not marking. Watch specifically for pupils writing 0.7 as 7% instead of 70% and correct on the spot.

5. **Class Challenge.** Keep the board work brisk — pupils take turns, check each answer, class confirms, move on. Ask for a prediction of where the battery lands before each check; on the final $\frac{1}{6}$ the marker lands near 17% and the class names it as a running-on decimal.
6. **What Did We Notice?.** Listen for pupils naming $\frac{1}{3}$ and $\frac{1}{6}$ as the runners-on and $\frac{1}{8}$, $\frac{2}{5}$, $\frac{3}{4}$ as the clean stoppers. Revoice a strong answer: 'when the remainder reaches zero the decimal stops; when the same remainder keeps coming back it never quite does.' Don't push toward the formal denominator rule.

COMMON MISCONCEPTIONS

⚠ Pupils write 0.7 as 7% — they read the digits after the point straight off instead of scaling to hundredths.

Stop and drag the battery slider to 0.7: it sits at seven tenths, well past halfway. Ask 'if halfway is 50%, can seven tenths be only 7%?' Rewrite 0.7 as 0.70 so the two hundredths digits show, then read it as 70%.

⚠ When a decimal runs on — pupils meet $\frac{1}{6}$ and expect it to stop like the others, so they round 0.1666... to 0.16 or 0.17 and treat it as finished.

Do $1 \div 6$ on the board slowly and stop at the remainder that keeps returning. 'It doesn't stop — it keeps handing us the same remainder.' Link it to $\frac{1}{3}$, which they've already seen do the same, so $\frac{1}{6}$ joins the running-on family rather than being a rounding error.

DIFFERENTIATION

EMERGING

- Give these pupils only the clean-stopping values ($\frac{3}{5}$, $\frac{1}{4}$, $\frac{9}{10}$) at the slider and their copy; hold $\frac{1}{6}$ for teacher-supported time so they secure the tidy family first.
- Pre-fill one of the two missing forms on each copybook row so pupils supply only the third equivalent rather than both at once.

DEVELOPING

- After the copybook rows, ask pupils to sort today's fractions into two columns — 'stops' and 'runs on' — and add one fraction of their own to each column.
- Pose $\frac{1}{6}$ alongside $\frac{5}{6}$ and ask whether $\frac{5}{6}$ also runs on, and to predict its decimal before checking on the slider.

PROFICIENT

- Ask: without dividing every one out, can you predict which fractions will run on? Let them test a few ($\frac{1}{9}$, $\frac{1}{7}$, $\frac{1}{8}$) on the slider and describe any pattern they notice — no formal denominator rule needed, just their own conjecture in the copy.
- Set a harder teacher-narrated variant during the Class Challenge: given 12.5%, find the fraction and decimal, working backwards from the percent.

➤ **Cross-curricular:** Tie to the science strand — pupils read their tablet or phone battery level as a percentage and write it three ways: percent, decimal and a rough fraction.

ANSWER KEY

Scaffold: visual check on the page

Q1: $0.5 = 50\%$

Q2: $\frac{1}{4} = 25\%$

Q3: $0.75 = 75\%$

Q4: $0.125 = 12.5\%$

Q5: $\frac{3}{5} = 60\%$

a) Always : Halving gives the decimal 0.5 and the percent 50%.

b) Sometimes : True for $\frac{1}{4} = 0.25$; false for $\frac{1}{3} = 0.333...$, which runs on.

c) Always : One quarter is 0.25 which is 25 out of 100.

d) Sometimes : Many percents are whole like 75% but some like 12.5% have a decimal.

EXTENSION SHEET · STRETCH ANSWERS

S1: $20\% = \frac{1}{5} = 0.2$

S2: $75\% = \frac{3}{4} = 0.75$