

Units of time and how they relate

CURRICULUM ALIGNMENT

MEA.TIM.3b

identify the relationship between different units and representations of time.

MEA.TIM.3a

compare, approximate and measure time using appropriate units of measurement.

INTERACTIVES

Analog Clock Builder · display, explore

WHAT THIS LESSON TEACHES

Seconds, minutes, hours and days nest inside each other. 60 seconds make 1 minute, 60 minutes make 1 hour and 24 hours make 1 day.

→ 2 minutes is the same length of time as 120 seconds.

→ Half an hour is 30 minutes but also 1800 seconds.

MODEL THIS ON THE BOARD

CHANGING MINUTES INTO SECONDS

- 1 Start with the fact that 1 minute holds 60 seconds.
- 2 For 2 minutes multiply 2 by 60.
- 3 $2 \times 60 = 120$, so 2 minutes = 120 seconds.

LESSON ARC

Open with a silent timed minute on the IWB stopwatch and hold the class's guesses for seconds-per-minute and minutes-per-hour. Then trace both clock hands on the analog-clock interactive — a full 60-sweep of the second hand for one notch of the minute hand. Pupils drive the clock together, build a fact list (60, 60, 24, 7) in copybook, then work four conversions on the board. Student Activity Book practice follows.

TEACHING MOVES

1. **Getting Started.** Run the silent minute on the IWB stopwatch with the second hand visible. Take two or three hands-up guesses for the seconds, then the how-many-minutes-in-an-hour question — but don't confirm. Hold the guesses; the next step proves them.
2. **Watch and Notice.** On the clock interactive, point to the second hand's full sweep and name the surprise: 'all that, for one little notch of the minute hand.' Then trace the minute hand's full circle to land on a new hour, and draw out the pattern aloud — 60, 60, 24, 7.
3. **Try It Together.** Rotate pupils to the board to sweep the minute hand a full turn while the class counts the sixty minutes with them. Watch for anyone who reads a small minute-hand move as an hour — insist it takes the full sweep of 60 before the hour changes.
4. **Build the Fact List in Your Copy.** Pupils copy and complete the four-line fact list (60, 60, 24, 7) then add one time fact of their own. Walk the room glancing at the blanks — if a pupil stalls on day-in-hours, point them back at the clock rather than telling them the answer.
5. **Class Challenge.** Brisk board turns through the four conversions — pupils check each answer and the class confirms before moving on. For every one, ask first 'which way are we going?' — smaller unit means multiply, bigger unit means divide. Revoice the half-hour: half of the 60 minutes in an hour is 30.

6. What Did We Notice?. Ask why a bigger unit gives a smaller number for the same time. Listen for 'seconds are tiny so you need lots of them.' Revoice a strong answer: the smaller the unit, the more of them it takes. Display-only discussion — no writing.

COMMON MISCONCEPTIONS

⚠ Pupils think 'a bigger number means more time' — so 1800 seconds sounds longer to them than 30 minutes, even though they're the same.

Put 30 minutes and 1800 seconds side by side on the board and ask which is longer. Use the clock to show both describe the same half-turn of the minute hand. Say it plainly: smaller unit, more of them — the amount of time hasn't changed.

⚠ During the clock work, pupils treat any small movement of the minute hand as 'an hour has passed' rather than waiting for a full 60-minute sweep.

Freeze the minute hand mid-sweep on the interactive and ask 'has an hour gone by yet?' Sweep it the full way round, counting the sixty minutes with the class, before you let the hour hand move on one notch.

⚠ In the conversions, pupils divide when they should multiply (or vice versa) — e.g. answering 3 minutes = 20 seconds instead of 180.

Before any calculation, make them say out loud whether they're heading into a smaller or bigger unit. Anchor it on the clock: going to seconds means lots more of a tinier unit, so the number has to grow — multiply.

DIFFERENTIATION

EMERGING

- Keep these pupils on the first three Class Challenge conversions (seconds, minutes, hours) and count in 60s on the clock face with them before each answer.
- Pre-fill the two harder blanks (24, 7) in their copybook fact list so they focus on the two 60s they've just seen proven on the clock.

DEVELOPING

- Add a missing-number twist on the board: '180 seconds = ____ minutes' — same fact, worked backwards.
- Ask how many seconds are in half an hour, chaining the half-hour conversion straight into the seconds one.

PROFICIENT

- Pose: how many hours in one whole week? Ask them to explain the two steps (days-to-hours) to the class as if teaching a younger pupil, then move them ahead into the Student Activity Book page.

✓ **Cross-curricular:** Tie to PE — time pupils holding a plank or balance for one minute and have them convert their best effort into seconds.

ANSWER KEY

- a) 120 seconds
b) 1800 seconds
c) 180 minutes

Q1: 60

Q2: 60

Q3: 24

Q4: 1800 seconds

Q5: 2

Spot:

Aoife added 2 instead of another full group of 60. 2 hours = $60 + 60 = 120$ minutes (or $60 \times 2 = 120$).

EXTENSION SHEET · STRETCH ANSWERS

S1: 5 h 52 min

S2: 2 h 41 min

S3: 3 h 3 min