Lesson 3 · living-things

The Brain, Senses and Reflexes

Lesson at a glance

Drop a ruler with no warning between a volunteer's fingers to spark the wonder, then teach the eyes-brain-hand message chain. Model one full catch out loud, then groups run the class-wide fair test: three catches with eyes ready versus three while a partner distracts them, reading the centimetre mark and finding the middle value on the Investigation Journal page. Pool two class figures into a bar chart on the IWB. A feely-bag touch test adds a second sense before a display-only make-sense talk.

Learning objectives

- Investigate how the brain takes in information from the senses and reacts to stimuli, sometimes without thinking
- Compare reaction times under different conditions using a fair test
- Record and compare measured results across the class

Before the bell — prep

Gather one 30 cm ruler per group plus one for your demo. Fill a feely-bag per group with 3–4 safe everyday objects (conker, smooth pebble, wooden block, sponge). Have the IWB data-recorder ready with Condition and Catch distance columns. Mark the 0 cm end so groups always hold the ruler the same way up — that one habit keeps the test fair.

Materials

Item	Qty	Per	Source	Low-cost substitute
30 cm ruler	1	group	school kit	a long strip of stiff card marked with centimetres
cloth drawstring feely-bag holding 3 to 4 safe everyday objects (conker, smooth pebble, wooden block, sponge)	1	group	classroom	a sock or pillowcase with everyday classroom objects inside
Investigation Journal page	1	pupil	classroom	lined paper ruled into a simple table

Safety watch-point

Check feely-bag objects are safe to handle blind — no sharp edges or anything small enough to mouth. Drop rulers gently between fingers, never flick or throw them.

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Teaching moves

- **How the Brain Reacts:** Reveal the table one row at a time and point at the body as you read: eyes see, message to brain, brain decides, message to hand. Pre-empt the 'slow = bad at it' mix-up — say reaction times vary and get faster with practice and full attention.
- **Model One Full Catch:** Have a volunteer drop for you and think aloud through all four beats: 'I predict… I test… I observed… I think…'. Catch three times, read the three marks aloud (e.g. 16, 12, 14) and show the middle value is 14 — not adding and dividing, just the one between smallest and largest.
- **Run the Fair Test:** Set groups of three or four: one catches, one drops, one reads and records, then swap. Circulate and watch droppers give no warning and release cleanly. Re-voice 'same ruler, same dropper, same start position' to anyone changing the setup between conditions.
- **Pool the Class Results:** Drive the IWB data-recorder yourself. Enter just two rows — Eyes ready and Distracted — using the typical middle value across groups. Tap to the bar chart and ask: which bar is shorter, and what does a short bar tell us about reaction time?
- **Touch Only: What Is It?:** Pupils take turns: feel without looking, describe (hard/soft, smooth/rough, round/pointy), guess, then reveal. Keep it brief — draw out that the brain also reads touch, not just sight.

What it should show

Expect most groups to catch the ruler LOWER (longer distance, slower reaction) when distracted than with eyes ready — distraction usually slows reactions, and that is a real finding. A group whose distracted catches look faster usually had a half-hearted distractor, or the catcher was peeking at the dropper's signal; re-run with the catcher watching only the ruler and the partner talking steadily.

Misconceptions & interventions

- **Pupils think catching higher up means they are 'better' or quicker.** — Trace it on the ruler: a LOWER catch distance means the fingers closed sooner, so it is the faster reaction. Hold the ruler up and show that the shorter the fall, the quicker the body reacted.
- **Pupils think a reflex like pulling back from a hot pan goes all the way to the brain to decide.** — Keep it simple for the class — say the body just acts automatically to protect you, faster than thinking. Contrast with the ruler catch, where the eyes did send the message to the brain first.

Differentiation

Emerging	Developing	Proficient
• Pair with you at the teacher table and let them catch with both hands while you drop slowly to build confidence before timing. • Give a recording row with the three catch boxes pre-labelled so they just write the centimetre mark.	• Add a 'why?' prompt: ask them to predict before each condition and say why distraction might slow the catch. • Have them check their three readings and circle the middle value themselves.	• Ask them to critique the fair test — what would happen if a different person dropped each time? Name one thing kept the same and why it matters. • Challenge them to suggest a third fair condition the class could test next, using only the same ruler.

Cross-curricular hook

Tie to the Maths Data strand — pupils enter the two class figures, read the bar chart and compare which bar is shorter.