

Forces start, stop and turn things



Lesson at a glance

Open with a still soft ball and ask what could start and stop it. Model a gentle push and a hand-stop, fold in push, pull and force, then flash a quick Station B turn and Station C pull-to-slow. Groups rotate a three-station play circuit naming each force and change with the stem, then record two stations in the Investigation Journal. Close with a PE and playground talk and a side-push turn question.

Learning objectives

- Show how pushes and pulls make things start, stop, speed up, slow down or change direction
- Name the force and the change of motion at each play-circuit station

Before the bell – prep

Clear three floor lanes before the bell. Tape a simple bend at Station B. Set one soft ball (A), one toy car (B), and one trolley or wheeled toy with handle or string (C). Split into three groups; plan three ~4-minute rotations. Keep car and trolley hidden until the step-2 preview.

Materials

Item	Qty	Per	Source	Low-cost substitute
soft ball	1	class	school kit	a rolled pair of socks or a sponge ball
toy car	1	class	school kit	a small wooden block on bottle-top wheels, or a marble in a short card channel
trolley or wheeled toy with a handle	1	class	classroom	a cardboard box on four bottle-top wheels with a string handle
masking tape	1	class	classroom	chalk lines outdoors, or two parallel books to mark a lane on a long table
Investigation Journal pages	1	pupil	classroom	a blank page with two rows ruled for force and what changed

Safety watch-point

Stay at Station C. Gentle pulls only from behind against the roll; one object moving per station; roll away from feet and faces; no racing between groups.



Teaching moves

- **Getting Started:** Hold one soft ball still on the floor. Take three or four quick hands-up ideas for start and stop. Accept push, kick and pick-up without correcting yet; leave the question open and keep the car and trolley out of sight.
- **Pushes and pulls change motion:** Keep this to about five minutes. Wonder, predict, push the ball along a clear lane, then stop it with a flat hand. Voice: push started it; hand-push stopped it. Bring out car and trolley only now for a 30-second teacher preview: side push turns the car; gentle pull from behind slows the trolley.
- **Forces play circuit:** Stay at Station C the whole circuit — two children and a moving trolley need you. Run A and B with Actor / Namer / Watcher roles; one object moving at a time. At C insist: Actor 1 gentle push away, Actor 2 gentle pull from behind against the roll — no yank, no path-standing. Revoice the stem after each turn.
- **Record the force and the change:** Before journals open, stand at each station and restate the intended force and change so recording checks understanding, not rotation memory. Keep the stem and word bank on the board. Two rows only; accept word plus simple drawing. If a child writes it stopped by itself, have them show the stopping hand and add the force.
- **Forces in the playground and PE:** Draw out pass, catch, scooter turn, swing push, slowing before a wall. Revoice every example into push, pull, start, stop, turn, speed up, slow down — forces on the yard, not only in science.

What it should show

Station A: push starts the ball; hand or cushion stops it; stronger push speeds up. Station B: side push turns the car along the taped bend. Station C: pull from behind against the roll slows the trolley smoothly. Odd results usually mean a yank, a push mistaken for a pull, or the ball stopping with no named hand — re-run and revoice the stem.

Misconceptions & interventions

- **It just stopped by itself — nothing pushed it.** — Ask them to show the stopping force with a flat hand or cushion on the ball lane, then add push and stop to their journal row.
- **Pulling the trolley means dragging it toward me from the front, like a tug.** — Reset Station C: start the roll away, then hold the handle from behind and pull gently backward against the motion so it slows without a bump.
- **A turn needs a new kind of force, not a push.** — Replay Station B: one clear side push on the car along the tape and say together, the force was a push; it made it turn.



Differentiation

Emerging	Developing	Proficient
• Draw the station and tick push/pull and start/stop/turn/speed up/slow down from the board word bank; teacher or peer namer models the stem first.	• At A or B if finished early, compare a softer and a stronger push and say which went further or faster using the same stem.	• Add a gentle/strong note on the journal row, or name both the start push and the slowing pull at Station C.

Cross-curricular hook

Link to PE — name the push that starts a pass and the force that stops a catch on the yard.