

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 push and pull on the classroom door, then give a 30-second gesture preview of Stations B and C only. Groups rotate a three-station forces circuit: start/stop a ball, turn a toy car on a taped bend, and slow a trolley with a gentle pull from behind. After a whole-class oral replay, pupils record two stations on the Investigation Journal page using the stem 'The force was a _____. It made it _____.' Close by naming pushes and pulls in PE and yard games.

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 the day before. Tape a simple curved bend at Station B. Set three soft balls and three short lanes (A), three toy cars and three taped bends (B), and one trolley or wheeled toy with a handle or string (C). Split the class into three rotation groups.

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. Rolls and pushes away from feet and faces; one moving object per lane; gentle pulls from behind only; no racing into other groups.



Teaching moves

- **Getting Started:** Hold one soft ball still on the floor. Take three or four quick ideas on how to start and stop it. Accept every idea and leave the question open. Keep the toy car and trolley out of sight.
- **Pushes and pulls change motion:** Model push and pull on the classroom door, not the ball: pull the handle to open, push to close, saying wonder–test–observed–think aloud. Fold in push, pull and force as the class sees them. Then show Stations B and C for 30–40 seconds only — name the force and the change, do not give the full answers away.
- **Forces play circuit:** Stay at Station C for the whole circuit; A and B run with peer Actor/ Namer/Watcher roles. At C, Actor 1 pushes the trolley away, then Actor 2 pulls gently from behind against the motion so it slows. Watch for yanks, racing or anyone in the path. If a group finishes early at A or B, try softer then stronger pushes on the same object.
- **Record the force and the change:** Before journals open, stand briefly at each station and re-state the intended force and change so recording checks understanding, not crowded memory. Keep the stem and word bank on the board. Circulate: if a child writes that something stopped by itself, ask them to show the stopping force with their hand and add it.
- **Forces in the playground and PE:** Put the focus question, give one minute of partner talk, then take a few aloud. Echo each example back in lesson words — push, pull, start, stop, turn, speed up, slow down — so yard games are named as real forces, not only science-lesson words.

What it should show

Station A: a push starts the ball; a flat hand or soft cushion stops it; a stronger push speeds it up. Station B: a side push turns the car around the taped bend. Station C: a gentle pull from behind, against the roll, slows the trolley smoothly. A trolley that jerks or races usually had a yank or a pull from the wrong side — re-run with a gentle opposing pull from behind.

Misconceptions & interventions

- **‘It just stopped by itself’ — pupils think moving things stop without a force.** — At Station A, have them place a flat hand in the ball’s path and name that push as the stop. If needed, name floor rubbing as the force that slows a free-rolling ball.
- **Pupils call every action a push, or mix up push and pull on the trolley.** — Replay the door model: pull brings it towards you, push sends it away. At Station C, freeze the moment Actor 2 holds the handle and ask ‘towards you or away?’ before they name it.
- **At Station C, pupils pull the trolley forward or stand in its path, turning the slow-down into a tug or a crash.** — Reset roles: Actor 1 starts it away; Actor 2 stands behind on the same side and pulls gently backward against the motion only. Success is a smooth slow, not a yank.



Differentiation

Emerging	Developing	Proficient
• Draw the station and tick push/pull and start/stop/turn/speed up/slow down from the board word bank; use the fuller stem with ball/car/trolley if needed. • Pair as Watcher first at A or B so they hear the stem before acting.	• Record two stations with the stem plus a simple drawing; compare a softer and stronger push at A or B and say which went further or faster.	• Add a gentle/strong note on the journal page and name both forces in the Station C sequence (start push and slowing pull). • Offer one playground or PE example that uses the same force-and-change pair as a station they recorded.

Cross-curricular hook

Link straight into PE and yard games — passes, catches, scooters and swings — naming each as a push or pull that starts, stops or turns.