

Extension — Forces Engineer Challenge

Think like an engineer

Ready for a challenge? These questions ask you to think like an engineer — using forces to design and solve problems.

Challenge questions

Q1. Friction can be helpful *and* unhelpful. Give one example where we **want more** friction and one where we **want less**, and explain each.

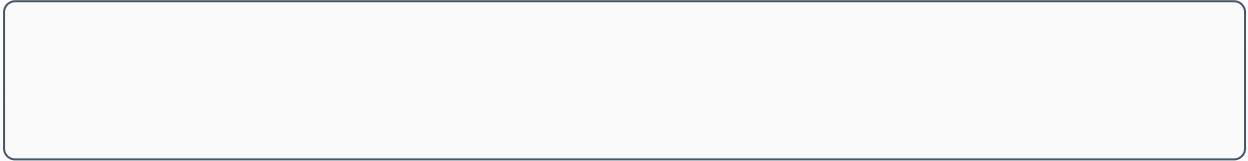
Situation	Why we want more/less friction
Want MORE friction	
Want LESS friction	

Q2. Design a fair test. You want to find out: *does a heavier toy car roll further down a ramp?* Describe your test — what you would change, measure and keep the same.

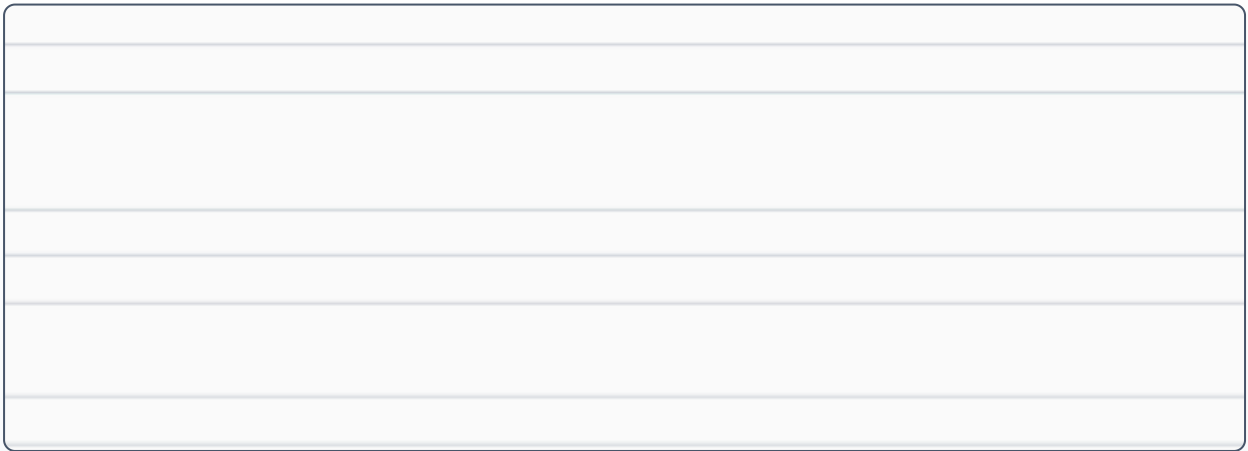
Q3. A skydiver falls fast, then opens a parachute and slows down. Draw and label the force arrows **before** and **after** the parachute opens, and say when the forces are unbalanced.

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Q4. Design challenge — the multistorey car park. Engineers need to get toy cars safely from a high floor down to the ground. Design a ramp or system using what you know about forces (gravity, friction). Draw it, label the forces, and explain how you would stop the cars going too fast.



Q5. Big thinking. Magnets can push without touching. Invent a useful machine or toy that uses magnets to push or pull something. Explain how the poles make it work.



Great engineers **use forces on purpose** — adding friction to slow things, shaping ramps to control speed, and using magnets to move things without touching.