

Pushes, pulls and balanced forces

Grade 7 science (Year 8 · Class 7) · Test

Name: _____ Date: _____ Class: _____ Mark: ____ / 20

This test checks types of force, measuring force, drawing force arrows and finding net force. Show every step of any calculation, give units and directions, and explain your answers clearly.

Level: Grade 7 science (Year 8 · Class 7) · **Curriculum:** MS-PS2-1, MS-PS2-2

Time: 45 minutes · 8 questions · Total: 20 marks · Calculator allowed

Question 1 Contact forces (2 marks)

Classify each force as contact or non-contact.

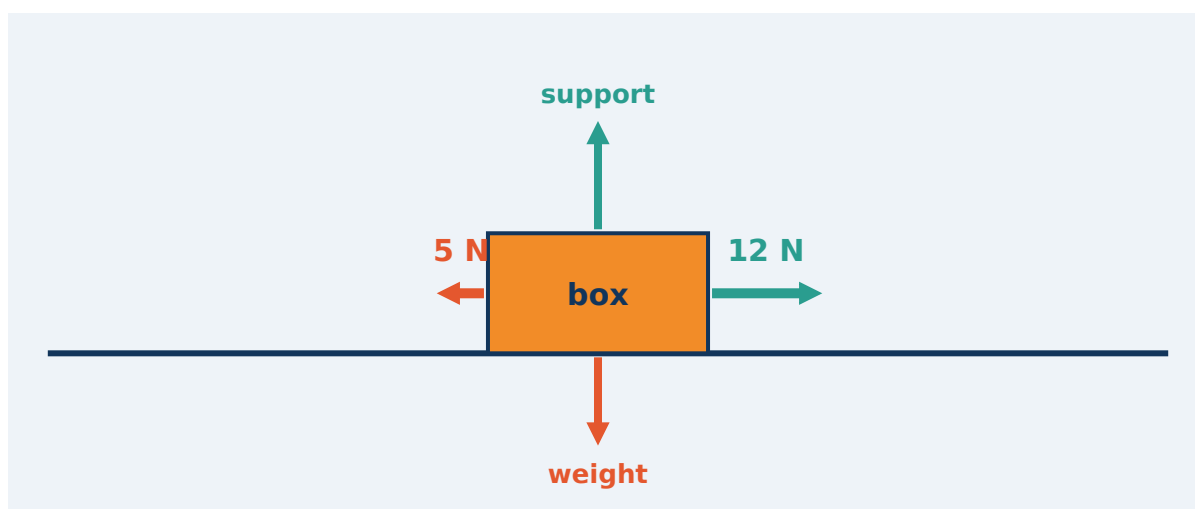
- a. Friction. (1 mark)
- b. Magnetic force. (1 mark)

Question 2 Measuring force (2 marks)

State the unit of force and name the instrument used to measure it.

Question 3 A pushed box (3 marks)

A box is pushed along a floor.



Forces on a box.

- a. Calculate the net horizontal force. (2 marks)
- b. Describe the motion of the box. (1 mark)

Question 4 Cyclist at steady speed (3 marks)

Wanjiru cycles at a steady speed along a flat road. The driving force from the pedals is 40 N.

- State the total resistive force on the bicycle. (1 mark)
- Explain your answer. (2 marks)

Question 5 Action and reaction (2 marks)

A skater pushes against a barrier with 60 N. State the force the barrier exerts on the skater and say which way the skater moves on the ice.

Question 6 Drawing arrows (3 marks)

A diagram uses the scale 1 cm = 5 N.

- Calculate the arrow length for a 30 N force. (1 mark)
- Calculate the force shown by an arrow 2.5 cm long. (1 mark)
- State what the direction of an arrow shows. (1 mark)

Question 7 Rope pulled both ways (3 marks)

Team A pulls a rope with 540 N to the left and team B pulls with 495 N to the right.

- Calculate the net force. (2 marks)
- State which team wins and why. (1 mark)

Question 8 Heavy or light (2 marks)

Explain why the same 20 N push makes a light trolley speed up more than a heavy trolley.