

**YEAR 8**

Forces and Motion

Show the equation, then the numbers, then the answer with its unit. Marks are given for the working, not only for the final number.

Section A · Forces and their effects

- 1 State the unit that force is measured in. **The newton, N**
- 2 Name the instrument used to measure force. **A newton meter, or force meter**
- 3 What is meant by a **balanced** pair of forces? **The forces are equal in size and act in opposite directions**
- 4 A book rests on a table. Name the two forces acting on it. **Its weight acting downwards and the contact force from the table acting upwards**
- 5 Name the force that opposes motion between two touching surfaces. **Friction**
- 6 Give **one** way friction is useful and **one** way it is a nuisance. **Useful: brakes work, or shoes grip the ground. Nuisance: parts wear out, or energy is wasted as heat**

Section B · Speed, distance and time

- 7 A runner covers 100 m in 20 s. Calculate their speed. **5 m/s**
- 8 A car travels at 15 m/s for 40 s. Calculate the distance travelled. **600 m**
- 9 A cyclist covers 900 m at a steady 6 m/s. Calculate the time taken. **150 s**
- 10 A train covers 3000 m in 100 s. Calculate its speed. **30 m/s**
- 11 A walker moves at 1.5 m/s for 200 s. Calculate the distance travelled. **300 m**
- 12 On a distance-time graph, what does a horizontal line tell you? **The object is stationary**
- 13 On a distance-time graph, what does a steeper line tell you? **The object is moving faster**

Section C · Mass, weight and gravity

- 14 State the equation linking weight, mass and gravitational field strength. **Weight = mass × gravitational field strength**
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- 15 On Earth g is 10 N/kg. Calculate the weight of a 6 kg bag. **60 N**
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- 16 Calculate the mass of an object that weighs 250 N on Earth, where g is 10 N/kg. **25 kg**
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- 17 On the Moon g is about 1.6 N/kg. Calculate the weight of a 6 kg bag on the Moon. **9.6 N**
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- 18 Explain why your mass is the same on the Moon but your weight is not. **Mass is the amount of matter and does not change. Weight depends on gravitational field strength, which is weaker on the Moon**
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- 19 A parachutist falls at a steady speed. What can you say about the forces acting on them? **They are balanced: the weight downwards equals the air resistance upwards**
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