

1. Motion, forces and energy

Starter Quiz · 课前小测

IGCSE Physics

Name: _____ Score: _____

1. You measure water in a measuring cylinder. How should you read the scale?

- ☐ eye level with the bottom of the meniscus (the curved surface)
- ☐ eye above, looking down at the water
- ☐ eye below, looking up at the water
- ☐ at the very top of the cylinder

2. A runner covers 100 m in 8.0 s. What is the average speed, in m/s?

_____ m/s

3. An astronaut travels from Earth to the Moon. What happens to their **mass** and **weight**?

- ☐ mass stays the same; weight gets smaller
- ☐ both stay the same
- ☐ mass gets smaller; weight stays the same
- ☐ both get smaller by the same amount

4. A force of 8.0 N stretches a spring by 0.040 m (within the limit of proportionality). What is the spring constant, in N/m?

_____ N/m

5. Momentum is a vector.

- ☐ True
- ☐ False

6. Select **all** of these that are **energy stores**.

- ☐ kinetic
- ☐ chemical
- ☐ gravitational potential
- ☐ loud
- ☐ fast

Tick every correct option.

7. A box pushes down with a force of 200 N over an area of 0.50 m². What is the pressure, in Pa?

_____ Pa

8. A stack of 100 sheets of paper is 12 mm tall. How thick is one sheet, in mm?

_____ mm

9. A car speeds up from rest to 20 m/s in 4.0 s. What is its acceleration, in m/s²?

_____ m/s²

10. The resultant force on a moving car is zero. What does the car do?

- ☐ keeps moving at constant velocity (same speed, same direction)
- ☐ speeds up
- ☐ stops at once
- ☐ turns around

1. eye level with the bottom of the meniscus (the curved surface)

Read at the bottom of the meniscus with your eye level with it — looking from above or below gives a parallax error (a wrong reading).

2. 12.5 m/s

$$v = \frac{s}{t} = \frac{100}{8.0} = 12.5 \text{ m/s.}$$

3. mass stays the same; weight gets smaller

Mass (amount of matter) never changes. Weight is the force of gravity, and the Moon's gravity is weaker, so the weight is smaller.

4. 200 N/m

$$k = \frac{F}{x} = \frac{8.0}{0.040} = 200 \text{ N/m.}$$

5. True

Momentum is mass $\times$ velocity, and velocity has a direction, so momentum is a vector.

6. kinetic; chemical; gravitational potential

Kinetic, chemical and gravitational potential are energy stores. "Loud" and "fast" describe things, but they are not energy stores.

7. 400 Pa

$$p = \frac{F}{A} = \frac{200}{0.50} = 400 \text{ Pa.}$$

8. 0.12 mm

Measure many and divide: $12 \div 100 = 0.12 \text{ mm}$. Dividing makes the small measurement much more accurate.

9. 5 m/s²

$$a = \frac{\Delta v}{\Delta t} = \frac{20 - 0}{4.0} = 5.0 \text{ m/s}^2.$$

10. keeps moving at constant velocity (same speed, same direction)

Newton's first law: with zero resultant force, an object keeps moving at constant velocity (or stays at rest).