**OBHS Core Questions:**

Subject: Science

Year and Term: Year 10 Autumn Term

Topic: P5 Forces

Learn these questions to build a strong foundation of knowledge for this half-term. Ask family or friends to test you regularly, or practise on your own using the 'Look, Say, Cover, Write' method.

| Question | Answer |
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| 1. What is a scalar quantity? | A quantity with only magnitude (size), not direction |
| 2. What is a vector quantity? | A quantity with both magnitude and direction |
| 3. Give an example of a vector quantity. | Force |
| 4. What does the length and direction of an arrow show in a vector? | Length shows magnitude, direction shows direction |
| 5. What is a contact force? | A force where two objects are touching |
| 6. Give two examples of contact forces. | Friction, air resistance, water resistance, upthrust, tension, normal contact force, thrust |
| 7. What is a non-contact force? | A force where objects are not touching |
| 8. Give two examples of non-contact forces. | Gravity, magnetism, electrostatic |
| 9. What is the equation to calculate weight? | Weight = Mass × Gravitational Field Strength |
| 10. What is the unit of weight? | Newtons (N) |
| 11. What tool is used to measure weight? | Newtonmeter (or spring balance) |
| 12. What is the centre of mass? | The point where the whole weight of an object appears to act |
| 13. What is resultant force? | The overall force acting on an object |
| 14. What happens if resultant force is zero? | The object stays still or moves at a constant speed |
| 15. What is the formula for work done? | Work = Force × Distance moved |
| 16. What is the unit of work? | Joules (J) |

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| 17. What is elastic deformation? | When an object returns to its original shape after the force is removed |
| 18. What is inelastic deformation? | When an object does not return to its original shape after the force is removed |
| 19. What is Hooke's Law equation? | Force = Spring constant × Extension ($F = k \times e$) |
| 20. What is the equation for elastic potential energy? | $E = 0.5 \times k \times e^2$ |
| 21. What is the difference between distance and displacement? | Distance is how far; displacement includes direction |
| 22. What is the typical speed for walking? | About 1.5 m/s |
| 23. What is the formula for speed? | Speed = Distance / Time |
| 24. What is the formula for acceleration? | Acceleration = Change in velocity / Time |
| 25. What is Newton's First Law? | An object stays at rest or moves at constant speed unless a force acts on it |
| 26. State the equation for Newton's Second Law. | $F = m \times a$ |
| 27. What happens to acceleration if mass increases and force stays the same? | It decreases |
| 28. What is the formula linking force, acceleration and mass? | Mass = Force ÷ acceleration |
| 29. Name two parts which make up stopping distance. | Thinking and braking |
| 30. Name two things that affect reaction time, therefore affecting thinking distance. | Tiredness, alcohol, drugs, caffeine, |
| 31. How do icy roads affect braking? | Increases braking distance |

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| 32. What can affect a vehicle's braking distance? | Vehicle condition – for example, worn tires or ineffective brakes<br>Road condition - wet or icy roads make it harder to decelerate<br>Vehicle mass - a heavy vehicle, such as a lorry, takes longer to stop |
| 33. What's a danger of trying to slow down as quickly as possible in a vehicle? | Brake failure or skidding |
| 34. Two 2 kg carts collide. Cart A moves at 3 m/s, hits stationary Cart B, and stops. What is B's speed after? | 3 m/s<br><br>Because of conservation of momentum<br>total momentum before = total momentum after |