**Year 9 Science – Easter Newton’s Laws**

Link: <https://www.bbc.co.uk/bitesize/guides/z3rhqhv/revision/1>

1) According to Newton’s first law, what will happen to a stationary object if the resultant forces acting on it are zero? *(1 mark)*

2) According to Newton’s first law, what will happen to a moving object if the resultant forces acting on it are zero? *(1 mark)*

3) What force is produced by the friction between an object and particles in the air? *(1 mark)*

4) What equation is used to describe Newton’s 2nd law of motion? *(1 mark)*

5) What are the units of measurement for force? *(1 mark)*

6) What happens to the acceleration of an object if the resultant force acting on it increases? *(1 mark)*

7) What happens to the acceleration of an object if its mass decreases? *(1 mark)*

8) List the equipment required to investigate Newton’s 2nd law. *(1 mark)*

9) In the Newton’s 2nd law investigation, how do you change the force? *(1 mark)*

10) In the Newton’s 2nd law investigation, which piece of equipment measures the acceleration? *(1 mark)*

11) In the Newton’s 2nd law investigation, which type of graph should you use to plot your results? *(1 mark)*

12) What is Newton’s 3rd law of motion? *(1 mark)*

13) What two things must you remember about the forces in Newton’s 3rd law? *(1 mark)*

14) What are contact forces? *(1 mark)*

15) How do you calculate weight? *(1 mark)*

16) What are the units of measurement of weight? *(1 mark)*

17) What are the units of measurement of gravitational field strength? *(1 mark)*

18) What is the gravitational field strength on Earth? *(1 mark)*

19) Calculate the weight of a car that has a mass of 800kg. *(1 mark)*

20) Calculate the weight of the same car if it was on the moon, where the gravitational field strength is 1.6 N/kg. *(1 mark)*

21) The opportunity rover is a 185 kg robot. It was made on Earth and sent to the surface of the planet Mars. The weight of Opportunity on Mars is 703 N. Calculate the gravitational field strength on the surface of Mars. *(3 marks)*

22) A van accelerates up a hill until it reaches a speed of 25 m/s. It then remains travelling at 25 m/s. Describe how the resultant force acting on the van changes during this time. *(3 marks)*

23) A motorbike and its rider have a combined mass of 400 kg. Calculate the acceleration of the motorbike. *(3 marks)*



24) A toy car has a mass of 0.10 kg. The toy car accelerates at 2.0 m/s2. Calculate the force producing this acceleration. State the unit. *(3 marks)*

25) When a gun is fired, the person controlling the gun feels a recoil. Use Newton’s 3rd law to explain why this happens. *(3 marks)*

26) If a driver sees a hazard on the road, they may have to apply a large braking force to avoid hitting the hazard. If they do this while travelling at a high speed, it can be very dangerous.

Explain how applying a large braking force while travelling at a high speed can be dangerous. You should refer to Newton’s 2nd law in your answer. *(6 marks)*