

SP2d Core practical – Investigating acceleration

- 1 Acceleration is a change in speed over time (1), so find the difference in the two speeds and divide by the time taken to move between the two light gates. (1)
- 2 Weight is the force of gravity acting on a mass. (1)
- 3 The most likely suggestion is to prevent the masses or trolley falling on feet (1) by putting a box or other object beneath the masses. (1)
- 4 Ramp, supports for ramp, trolley, pulley, string, mass hanger, stacking masses, 2 light gates, data logger (1) plus whatever apparatus is involved in the safety suggestion they made in answer to question 3. (1)
- 5 To measure the time the trolley takes to move between the two light gates (1) as acceleration is calculated from a change in velocity divided by time (or equivalent explanation). (1) Do not accept 'to measure the speed/velocity at the beginning'.
- 6 The masses on the end of the string are accelerating as well as the trolley and any masses on it. (1) If the masses were just added to the end of the string, the accelerating mass would change each time as well as the force (1) so it would not be a fair test/the effect of the change in force could not be investigated. (1)
- 7 The acceleration is proportional to the force. (1)
- 8
 - a The acceleration gets less as the mass increases. (1) Do not accept 'the acceleration is inversely proportional to the mass' at this point as this cannot be determined for certain from the shape of the graph.
 - b Plot acceleration against $1/\text{mass}$ (or mass against $1/\text{acceleration}$), (1) if this is a straight line it will show that the acceleration is inversely proportional to the accelerating mass. (1)