AQA Physics GCSE

Required Practical 7

Acceleration

Method taken from AQA Required Practical Handbook

Aim:

Investigate the effect of varying the force on the acceleration of an object of constant mass.

Investigate the effect of varying the mass of an object on the acceleration produced by a constant force.

Equipment List:

- Metre ruler
- Toy car
- Weight stack (1N in steps of 0.2N)
- Bench pulley
- String
- Two stands, clamps and bosses
- Blu-Tac or rubber bands
- Chalk
- Stopwatch

Method:

1. Draw a series of straight lines, each 20 cm apart, perpendicular to the edge of the bench.
2. Attach the car to the string at one end, with the other end running across the bench pulley.
3. Attach the weight stand to the loose end of string (you may need to tie a knot at that end, to hook the stand onto). Hold the weight of the pulley, so it doesn't pull the car but so that the string is fully extended.
4. Release the weight stand (allowing it to fall) and begin the timer. Stop timing when the car hits the pulley at the other end of the bench.

To Investigate Changing Force on a Constant Mass:

A. Add a 10g mass to the weight stack, holding it so it doesn't pull the car but the string is fully extended.
B. Release the weights and time the car travelling across the bench.
C. Repeat the experiment by adding 10g weights and recording the time for each.

To Investigate Changing Mass with a Constant Force:

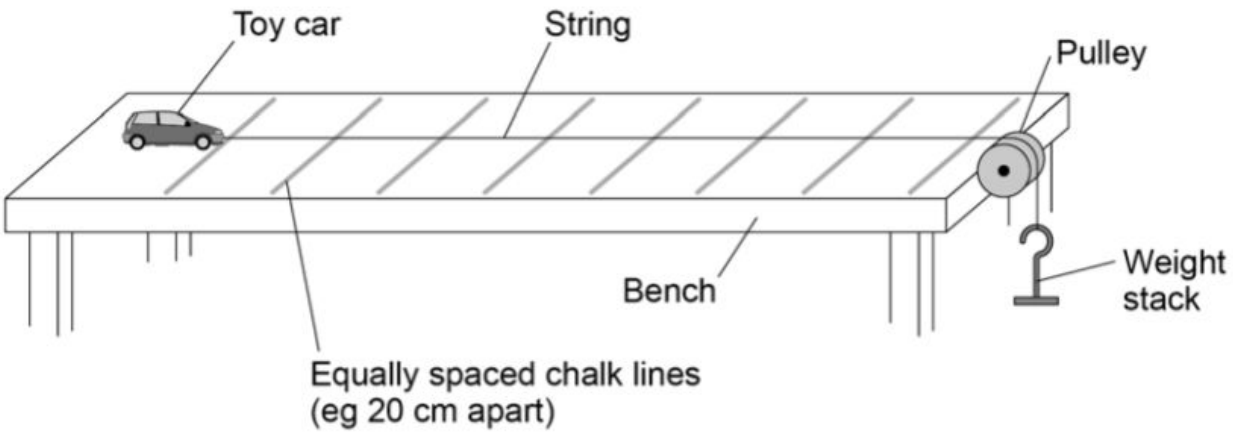
A. Attach a 10g mass on top of the toy car, using either the Blu-Tac or rubber bands.
B. Pull the car back to the starting chalk line.
C. Release the car and time how long it takes for the car to travel across the bench.

To calculate the acceleration, use the equation

$$acceleration = \frac{2 \times distance}{(time)^2}$$

Diagram:

Source: AQA Required Practical Handbook



Safety Precautions:

- Don't stand directly beneath the weight stack, incase any masses become loose and fall off the stack.