

AQA GCSE PHYSICS

Year 10 – Summer Term

CONTENT:

P9 – Motion

After this topic, students should know:

How speed is calculated for an object moving at constant speed; how a distance–time graph can tell us if an object is stationary or moving at constant speed; what the gradient of the line on a distance–time graph can tell us; how to use the equation for constant speed to calculate the distance moved or the time taken.

The difference between speed and velocity; how to calculate the acceleration of an object; the difference between acceleration and deceleration.

How to measure velocity changes and acceleration; what a horizontal line on a velocity–time graph tells us; how to tell from a velocity–time graph if an object is accelerating or decelerating; what the area under a velocity–time graph tells us.

How to calculate speed from a distance–time graph where the speed is constant and the speed is changing; how to calculate acceleration from a velocity–time graph; how to calculate distance travelled from a velocity–time graph.

P9.1 Speed and distance–time graphs; P9.2 Velocity and acceleration; P9.3 More about velocity–time graphs; P9.4 Analysing motion graphs.

P10 Force and motion

After this topic, students should know:

How the acceleration of an object depends on the size of the resultant force; the effect that the mass of an object has on its acceleration; how to calculate the resultant force on an object from its acceleration and its mass; what is meant by the inertia of an object.

The difference between mass and weight; about the motion of a falling object acted on only by gravity; what terminal velocity means; what can be said about the resultant force acting on an object that is falling at terminal velocity.

The forces that oppose the driving force of a vehicle; what the stopping distance of a vehicle depends on; what can increase the stopping distance of a vehicle; how to estimate the braking force of a vehicle.

How to calculate momentum; the unit of momentum; what momentum means for a closed system; what happens to the total momentum of two objects when they collide.

How momentum can be described as having direction as well as size; why two objects that push each other apart: move away at different speeds; have zero total momentum.

What affects the force of impact when two vehicles collide; how the impact force depends on the impact time; what can be said about the impact forces and the total momentum when two vehicles collide; why an impact force depends on the impact time.

Why cycle helmets and cushioned surfaces reduce impact forces; why seat belts and air bags reduce the force on people in car accidents; how side impact bars and crumple zones work; how to work out if a car in a collision was speeding.

What is meant when an object is called elastic; how to measure the extension of an object when it is stretched; how the extension of a spring changes with the force applied to it; what is meant by the limit of proportionality of a spring.

P10.1 Forces and acceleration; P10.2 Weight and terminal velocity; P10.3 Forces and braking; P10.4 Momentum; P10.5 Using conservation of momentum; P10.6 Impact forces; P10.7 Safety first; P10.8 Forces and elasticity.

Recommended online resources:

Kerboodle- Digital Textbook – [w:kerboodle.com](https://www.kerboodle.com) u:initialsurname p:initialsurname inst.code:yh7 – the individual lesson breakdown is here.

BBC Bitesize: KS4 Science AQA – then find the relevant topics

YOUTUBE: ‘GCSESCIENCELESSONS’ then search for the topic of interest

Oak National Academy: Lessons available linked to above topics.