# AQA GCSE Physics
## Student Checklist

# P10 Forces and motion

Name ..... Class ..... Date .....

| Lesson | Aiming for 4 | | Aiming for 6 | | Aiming for 8 | |
|---|---|---|---|---|---|---|
| P10.1 Force and acceleration | I can state the factors that will affect the acceleration of an object acted on by a resultant force. | ☐ | I can describe the effect of changing the mass or the force acting on an object on the acceleration of that object. | ☐ | I can define the inertial mass of an object in terms of force and acceleration. | ☐ |
| | I can calculate the force required to cause a specified acceleration on a given mass. | | I can perform calculations involving the rearrangement of the $F = ma$ equation. | ☐ | I can calculate the acceleration of an object acted on by several forces. | ☐ |
| | I can investigate a factor that affects the acceleration of a mass. | | I can combine separate experimental conclusions to form an overall conclusion. | ☐ | I can evaluate an experiment by identifying sources of error and determining uncertainty in the resulting data. | ☐ |
| P10.2 Weight and terminal velocity | I can state the difference between the mass of an object and its weight. | ☐ | I can calculate the weight of objects using their mass and the gravitational field strength. | ☐ | I can apply the mathematical relationship between mass, weight, and gravitational field strength in a range of situations. | ☐ |
| | I can describe the forces acting on an object falling through a fluid. | | I can apply the concept of balanced forces to explain why an object falling through a fluid will reach a terminal velocity. | | I can explain the motion of an object falling through a fluid by considering the forces acting through all phases of motions. | |
| | I can investigate the motion of an object when it falls. | | I can investigate the relationship between the mass of an object and the terminal velocity. | | I can evaluate the repeatability of an experiment by considering the spread of the results. | |
| P10.3 Forces and braking | | | I can state factors which affect the stopping distance of a car. | ☐ | I can categorise factors which affect thinking distance, braking distance and both. | ☐ |
| | | | I can calculate the thinking distance for a car from the initial speed and reaction time. | | I can calculate the braking distance of a car. | |
| | | | I can estimate the relative effects of changing factors which affect the stopping distance of cars. | | I can describe the relationship between speed and both thinking and braking distance. | |

# AQA GCSE Physics Student Checklist

## P10 Forces and motion

Name ..... Class ..... Date .....

| Lesson | Aiming for 4 | Aiming for 6 | | Aiming for 8 | |
|---|---|---|---|---|---|
| P10.4 Momentum | | I can apply the equation p = *mv* to find the momentum, velocity or mass of an object. | ☐ | I can fully describe the motion of objects after an explosion accounting for any frictional effects. | ☐ |
| | | I can describe how the principle of conservation of momentum can be used to find the velocities of objects. | ☐ | I can apply principle of conservation of momentum to a range of calculations involving the velocities of objects. | ☐ |
| | | I can investigate the behaviour of objects during explosions to verify the conservation of momentum. | ☐ | I can evaluate the data produced from an investigation and compare this to a theoretical framework. | ☐ |
| P10.5 Using conservation of momentum | | I can apply the law of conservation of momentum to find the momentum before and after impacts. | ☐ | I can apply the law of conservation of momentum to find velocities of objects. | ☐ |
| | | I can calculate the momentum of a combination of objects after an impact. | | I can analyse the velocities of objects in a wide range of collisions. | |
| | | I can evaluate data used to verify the law of conservation of momentum. | | I can evaluate an experimental technique and discuss in detail the factors which lead to differences between experimental data and an accepted law. | |
| P10.6 Impact forces | | I can describe collisions in terms of forces and conservation of momentum. | ☐ | I can apply the concept of equal and opposite forces in collisions to explain why momentum is conserved in impacts. | ☐ |
| | | I can calculate the force involved in an impact from the change in momentum and time. | | I can calculate changes in velocity and momentum during impacts using the force involved in the impact and the impact time. | |
| | | I can design features that will reduce the size of impact forces in a collision. | | I can plan an investigation into the impact forces involved in a collision and how they can be reduced. | |

# AQA GCSE Physics
## Student Checklist

# P10 Forces and motion

Name ..... Class ..... Date .....

| Lesson | Aiming for 4 | Aiming for 6 | | Aiming for 8 | |
|---|---|---|---|---|---|
| P10.7 Safety first | | I can describe the operation of some safety features of a car in simple terms. | ☐ | I can use scientific principles such as rate of change of momentum to explain detail the operation of a range of change of momentum to explain in detail the operation of a range of car safety features. | ☐ |
| | | I can identify critical data which can be used to examine the cause of an accident. | ☐ | I use data about an accident to discuss its likely cause. | ☐ |
| | | I can report on the differences in safety features between expensive and inexpensive cars. | ☐ | I can evaluate a range of optional safety features based on their costs and effectiveness. | ☐ |
| P10.8 Forces and elasticity | | I can explain the limitations of Hooke's law including the limit of proportionally. | ☐ | I can find the spring constant of a spring using a graphical technique. | ☐ |
| | | I can calculate the force required to cause a given extension in a spring using the spring constant. | | I can Hooke's law equation in a wide of situations. | |
| | | I can compare the behaviour of different materials under loads in terms of proportional and non-proportional behaviour. | | I can evaluate an investigation into the extension of materials in terms of the precision of the data. | |