CP2 Forces and Motion

CP2a Resultant Forces
Explain the difference between scalar and vector quantities.
Use arrows to represent the direction and magnitude of forces.
Define a resultant force.
Calculate resultant forces.
Explain whether forces on an object are balanced or unbalanced.
CP2b Newton's First Law
Describe the effect of balanced forces on moving and stationary objects.
Describe the effect of a non-zero resultant force on moving and stationary objects.
H Describe circular motion at constant speed as a changing velocity and hence as an acceleration.
H Describe the force needed to keep an object moving in a circular path.
H Give some examples of objects moving in circular paths and the type of centripetal force involved.
CP2c Mass and weight
Describe the difference between mass and weight.
List the factors that determine the weight of an object.
Recall the formula for calculating weight.
Calculate weights using the formula.
Change the subject of the weight formula to calculate mass or gravitational field strength.
CP2d Newton's Second Law
Describe what an acceleration is.
List the factors that affect the acceleration of an object.
Recall the formula that relates the factors affecting acceleration.
Use the formula relating force, mass and acceleration.
Change the subject of the formula relating force, mass and acceleration.
H Explain what inertial mass means.
CP2e Newton's Third Law
Describe what Newton's Third Law says.
Recall the meaning of 'equilibrium situation'.
Identify action–reaction pairs in familiar situations.

Distinguish between action–reaction pairs and balanced forces.
H Describe how objects affect each other when they collide.
CP2f Momentum
Describe the factors that affect the momentum of an object.
Calculate the momentum of moving objects.
Recall what happens to momentum during a collision.
Use the idea of conservation of momentum to calculate velocities of objects after collisions.
Calculate the force needed to produce a change in momentum in a given time.
CP2g Stopping distances
Describe how human reaction times are measured.
Recall typical human reaction times and the factors that affect them.
Describe the link between stopping distance, thinking distance and braking distance.
Recall the factors that affect stopping distances.
Describe how different factors affect stopping distances.
CP2h Crash hazards
Explain the meaning of a ‘large deceleration’.
Describe the dangers caused by large decelerations.
Explain why large decelerations cause dangers.
H Recall some typical forces involved in road collisions.
H Use knowledge of changes in momentum to estimate the forces involved in road collisions.