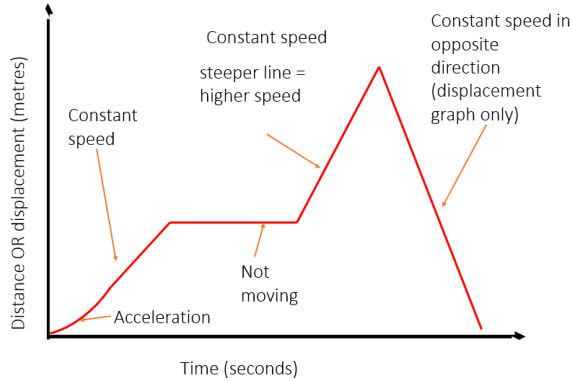


Physics - P9 Motion



$$s = vt$$

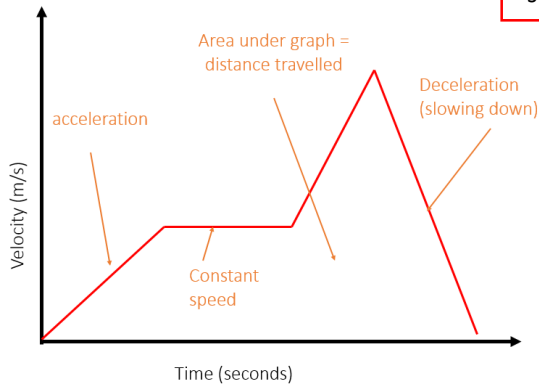
s = distance
v = speed
t = time

$$a = \frac{\Delta v}{t}$$

a = acceleration
Δv = change in velocity
t = time

$$v^2 - u^2 = 2as$$

v = final velocity
u = initial velocity
a = acceleration
s = distance



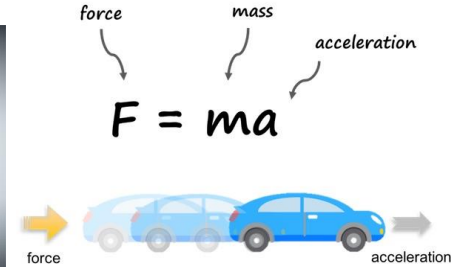
Distance is how far an object moves. It does not include an associated direction, so distance is a **scalar** quantity.

Speed is the **rate of change** of distance - a scalar quantity.

The **velocity** of an object is its speed in a particular direction.

Velocity is a **vector** quantity because it has both a magnitude and an associated direction.

Physics - P10 Forces and Motion



Newton's second law describes the relationships between a force acting on an object and the acceleration, and the mass of the object. Inertial mass is a measure of how difficult it is to change the velocity of an object.

The concepts of mass and weight can be linked through the idea of a gravitational field. Forces act on an object as it falls through a fluid and can result in a terminal velocity. The forces acting during stopping a car have been analysed; identifying two phases of the motion; thinking and braking distance and the effects of a wide range of factors on both of these distances.

The principle of conservation of momentum allows you to determine the velocity of objects after collisions or explosions have taken place in a range of scenarios.

Applying force stretching of a range of materials can produce both linear and non-linear relationships between the force and extension. Hooke's law can also be applied as appropriate.

Keywords:

Acceleration: The rate of change in speed (or velocity) is measured in metres per second squared. Acceleration = change of velocity \div time taken.

Collision: When two objects meet and interact, eg two particles moving towards each other will collide.

Conservation of momentum: The principle that the total momentum of a system remains the same. When bodies collide, whatever momentum is lost by one body, the other gains in equal amounts.

Distance: Numerical description of how far apart two things are.

Inertia: The tendency of an object to continue in its current state (at rest or in uniform motion) unless acted on by a resultant force.

Kinetic energy: Energy which an object possesses by being in motion.

Mass: The amount of matter an object contains. Mass is measured in kilograms (kg) or grams (g).

Momentum: A quantity relating to a moving object that is calculated by multiplying its mass by its velocity.

Speed: The distance travelled in a fixed time period, usually one second.

Tangent: A straight line that just touches a point on a curve.

Terminal Velocity: The maximum speed of an object, reached when the forces moving the object are balanced by its frictional forces.

Velocity: The speed of an object in a particular direction.

Videos



Quizzes

