

**SCIENCE AS 90940**  
**Demonstrate understanding of aspects of mechanics**  
**Level 1, 4 Credits**

This achievement standard involves demonstrating understanding of aspects of mechanics and may include using methods when solving related problems.

**Speed & Motion**

- Measurement of distance
  - Units of measurement
- Calculating speed; the relationship  $v = \frac{\Delta d}{\Delta t}$ 
  - Units for speed
- Interpretation of distance time graphs
  - Calculating average speed; the relationship  $a = \frac{\Delta v}{\Delta t}$
- Interpretation of speed time graphs
  - Calculating acceleration
  - Calculating distance travelled
- Calculating average acceleration and deceleration in the context of everyday experiences such as journeys, sport, getting going

**Mass, Weight & Force**

- Mass
  - Unit of mass – g
  - Mass is the amount of material (matter) in an object
- Weight
  - Unit of Weight – N;  $F_w = mg$
  - Turning mass into weight (on Earth); weight as the gravitational force on an object
- Acceleration due to gravity
- Forces
  - Unit of force
  - Balanced and unbalanced forces, in the context of everyday experiences such as being stationary, moving at constant speed, accelerating.
- The relationship  $F_{\text{net}} = ma$ .

**Force & Pressure**

- Force and pressure in the context of everyday experiences.
- The relationship  $P = \frac{F}{A}$ .

**Work, power & energy**

- Work and power and the relationships  $W = Fd$  &  $P = \frac{W}{t}$ .
- Gravitational potential energy & the relationship  $\Delta E_p = mg\Delta h$
- Kinetic energy & the relationship  $E_k = \frac{1}{2}mv^2$
- Conservation of mechanical energy in free fall situations in the context of everyday experiences such as sports performance, dropping things, tossing balls.