## Year 10 Energy and Change

### Wks 1-6

- **Measurement**
  - SI Quantities and Units: Length (m), time (s), mass (kg)
  - conversions (eg mm → m)

- **Distance/Displacement**
  - definitions (difference)
  - examples

- **Speed/Velocity**
  - definitions (difference)
  - examples, calculations
  - \[
  \text{speed} = \frac{\text{distance}}{\text{time}} \quad \text{velocity} = \frac{\text{displacement}}{\text{time}}
  \]
  - convert km/hr to m/s (÷ 3.6)

- **Newton’s Laws**
  - Law 1 (Inertia)
  - Law 2 \(a = \frac{F}{m}\)
  - Law 3 (action = reaction)

- **Energy**
  - Types
  - Measuring Energy, Force, Ek, Ep, W, P.
  - \(F=ma, W=Fs, P=W/t\) \(E_k=\frac{1}{2}mv^2, Ep=mg\)
  - Energy Transformations
  - Energy Transfer
  - Simple Machines (Levers, Gears) (distance/speed advantage or force advantage)
  - Efficiency
    - comparing efficiency of common devices

- **References/Other Notes**
  - Worksheets
  - Aspects 4 (2.1)
  - Aspects 4 (2.1)
  - Aspects 4 (2.2, 2.3, 2.4)
  - Expt design – reducing injuries in car crashes

### Wks 7-10

- **Sound**
  - Production (vibrating object in medium)
  - Propagation
    - longitudinal wave
    - compression and rarefaction
  - Speed of Sound
    - in solids, liquids, gases, vacuum
    - subsonic/supersonic
  - Reflection
    - echoes
  - Measuring Sound
    - decibels
    - loudness, amplitude
  - Resonance
    - musical instruments
    - relate pitch to size of vibrating object.
  - Speaking
    - controlling speech
  - Hearing
    - key parts and functions of the ear
    - range of hearing
  - *Recording Sound* (optional extension)

- **References/Other Notes**
  - *World of Light and Sound (Part A)
  - *Science for 90’s Bk3

- **Research**
  - Bionic Ears/ Speech Therapy/Musical Instrument/ Ultrasounds/ Echolocation/ Sonic Booms/ Sonar/ Treating Deafness/ Amplifiers/ A musical instrument/ A Sustainable Energy Alternative

- **End of Topic Test**