Energy

weight is the force of a mass due to gravity
weight (N) = mass (kg) x gravitational field strength (N/kg)
height is just a vertical distance
...so these two equations are equivalent to each other!

height and temperature are both measured as changes, which is often indicated by including a delta (triangle) symbol

Transfers

- Movement of a force — W = F x d
- Light — E = h x f (included for completeness: this is NOT in your course)
- Electrical — E = I x V x t

P = I x V

Power (rate of transfer of energy)

- power (watts) = energy (J) / time (s)
- power (kW) = energy (kWh) / time (h)

Stores (controllable)

- Gravitational — GPE = m x g x h
- Kinetic — KE = 1/2 x m x v^2
- Strain — E = 1/2 x k x e^2
- Thermal — Specific Heat Capacity — Q = m x c x T

Stores (fixed)

- Chemical — Energy stored in the electron arrangements of atoms and released in chemical reactions.
- Nuclear — Energy stored in the nucleus of an atom and released in nuclear reactions.

Terminology

- Energy is also known as "work done".
- The symbol for energy in equations is usually E but when talking about "work done" we use W and for (changes in) thermal energy we use Q.

Units

- Energy is ALMOST ALWAYS measured in joules (J)
- For large-scale situations, energy is measured in kilowatt-hours (kWh)
- Standard (SI) units for other quantities are;
  time in seconds (except for kWh)
  potential difference (voltage) in volts
  current in amps (A)
  distance (or height) in metres (m)
  mass in kg
  force in newtons (N)
  g, gravitational field strength, in N/kg
  velocity (speed) in m/s
  temperature in kelvin or degrees Celsius