

Science 10 Physics Units and Equations Sheet

Units used in physics:

- d = distance or displacement measured in Meters (m)
(how far something has travelled)
- d_0 = initial displacement or distance
- t = time in Seconds (s)
(how much time has passed from the start of measurement to the end)
- v = velocity measured in Meters/Second (m/s)
(how fast something is moving, can be - or + depending upon the direction travelled)
- v_0 = velocity initial or starting velocity
(at what speed something started at)
- a = acceleration measured in Meters/Second/Second (m/s^2)
(change in velocity over a change in time, can be - or + depending upon the direction)
- E_k = kinetic energy or energy from motion
- E_p = potential energy or energy from height
- J = the units of energy which one joule is (1 Newton)(1 meter) or (1N*m) = 1 J
- h = height above a reference level. Measured in meters (m)
- m = mass is always in kilograms (kg)

Formulas used in this unit:

$$\text{Equation 1: } \vec{d} = \vec{v}t$$

$$\text{Equation 6: Potential Energy} = mgh$$

$$\text{Equation 2: } \vec{v} = \vec{v}_0 + \vec{a}t$$

$$\text{Equation 7: Kinetic Energy} = \frac{1}{2}mv^2$$

$$\text{Equation 3: } \vec{d} = d_0 + \vec{v}_0t + \frac{1}{2}\vec{a}t^2$$

$$\text{Equation 4: } \vec{d} = d_0 + \vec{v}t - \frac{1}{2}\vec{a}t^2$$

You will need to apply your algebra skills to solve for different variables. I will not be teaching this in class

$$\text{Equation 5: } \vec{v}^2 = \vec{v}_0^2 + 2\vec{a}\vec{d}$$

Common Conversions:

$$10\text{mm} = 1\text{cm}$$

$$100\text{cm} = 1\text{m}$$

$$1000\text{m} = 1\text{km}$$

$$2.54\text{cm} = 1\text{in}$$

$$12\text{in} = 1\text{ft}$$

$$3\text{ft} = 1\text{yard}$$

$$5280\text{ft} = 1\text{mi}$$

$$60\text{ s} = 1\text{ min}$$

$$3600\text{ s} = 1\text{ hr}$$

$$1000\text{ g} = 1\text{kg}$$

Linear conversion equation example:

$$\left[\frac{100 \cancel{\text{km}}}{1 \text{ hr}} \right] \left[\frac{1 \text{ mile}}{1.61 \cancel{\text{km}}} \right] = \frac{62.1 \text{ mi}}{1 \text{ hr}} = 62.1 \text{ mph} \quad (\text{Remember that units have to cancel out as shown})$$