

## Equations Sheet

### Density:

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

### Hooke's Law:

$$F = k \times \Delta x$$

$$F = mg$$

$$g = 9.8 \frac{m}{s^2} \simeq 10 \frac{m}{s^2}$$

### Pressure:

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$$

### Specific Heat Capacity :

$$Q = \text{Heat}$$

$$\Delta T = \frac{\text{Heat Transferred}}{\text{mass} \times \text{Heat Capacity}} = \frac{Q}{mc}$$

$$Q = mc\Delta T$$

$$\text{Water's heat capacity} = c_{\text{water}} = 1 \frac{\text{cal}}{g^{\circ}\text{C}}$$

### Heat Required for Phase Transitions (Latent Heat):

$$L = \text{Latent Heat}$$

$$Q = mL$$

$$L_{\text{ice-water}} = 80 \frac{\text{cal}}{g},$$

$$L_{\text{water-steam}} = 540 \frac{\text{cal}}{g}$$

### First Law of Thermodynamics:

$$\Delta U = Q - W$$

Change in Internal Energy = Heat added – Work

### Vibrations and Waves:

$$\text{Frequency} = \frac{1}{\text{Period}}$$

$$\text{Wave Speed} = \text{Frequency} \times \text{Wave Length}$$

$$\text{Wave Speed} = \frac{\text{Wave Length}}{\text{Period}}$$