# Year 10 Introduction to Physics

## Formula & Data Sheet

**Formulae**

| | |
|---|---|
| Voltage | $V = \frac{E}{Q}$ |
| Current | $I = \frac{Q}{t}$ |
| resistors in series | $R_T = R_1 + R_2 + \ldots$ |
| resisitors in parallel | $\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \cdots$ |
| Ohm's law | V = IR |
| power | P = VI |
| energy | E = Pt |
| cost | Cost = Energy × Rate |
| average speed | $s = \frac{d}{t}$ |
| average velocity | $v = \frac{x}{t}$ |
| average acceleration | $a = \frac{\Delta v}{t}$ |

**PTO** ➡

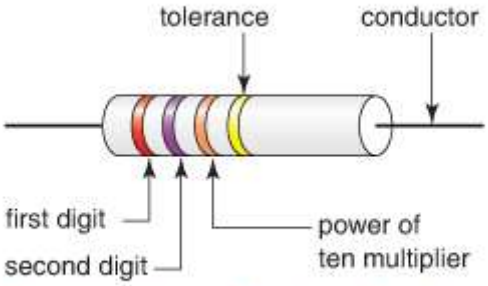
| | |
|---|---|
| Equations of constant acceleration | $v = u + at$ |
| | $x = ut + \frac{1}{2}at^2$ |
| | $x = vt - \frac{1}{2}at^2$ |
| | $x = \frac{1}{2}(u + v)t$ |
| | $v^2 = u^2 + 2ax$ |
| Energy equations | $E_k = \frac{1}{2}mv^2$ |
| | $E_{sp} = \frac{1}{2}k\Delta x^2$ |
| | $E_{gp} = mgh$ |

**Prefixes**

| Prefix | Abbreviation | Value |
|---|---|---|
| giga | G | $10^9$ |
| mega | M | $10^6$ |
| kilo | k | $10^3$ |
| milli | m | $10^{-3}$ |
| micro | $\mu$ | $10^{-6}$ |
| nano | n | $10^{-9}$ |

**PTO** ➡

## Colour Coding Resistors




*A resistor, showing the coloured bands*

| Colour | Digit | Multiplier | Tolerance |
|---|---|---|---|
| black | 0 | $10^0$ or 1 | |
| brown | 1 | $10^1$ | |
| red | 2 | $10^2$ | ±2% |
| orange | 3 | $10^3$ | |
| yellow | 4 | $10^4$ | |
| green | 5 | $10^5$ | |
| blue | 6 | $10^6$ | |
| violet | 7 | $10^7$ | |
| grey | 8 | $10^8$ | |
| white | 9 | $10^9$ | |
| gold | | $10^{-1}$ | ±5% |
| silver | | $10^{-2}$ | ±10% |
| no colour | | | ±20% |