# PHYSICS – Introduction to Fundamental Skills at A-Level

## Units

### Base Units

https://www.youtube.com/watch?v=jLRoseFxm30

https://www.npl.co.uk/si-units

https://isaacphysics.org/pages/gcse_ch1_1_text

*Questions to answer:*

What is a base, or SI base unit?

Find out what the base units are for the following:

| Quantity | SI Base Unit |
|---|---|
| Length | |
| Mass | |
| Time | |
| Temperature | |
| Electric current | |
| Amount | |
| Luminous intensity* | |

**You will not need to know about the base units for luminous intensity in the A-Level course*

### Extension (for interest – not compulsory!)

How were the kilogram and metre previously defined (ie: how did we know what a kg was)?

How are the base units defined now? Why?

https://www.npl.co.uk/si-units/the-redefinition-of-the-si-units

https://physics.nist.gov/cuu/Units/current.html

https://www.youtube.com/watch?v=m-fFRLWBzm8

https://www.youtube.com/watch?v=KSX6qXL4G20

https://www.youtube.com/watch?v=c_e1wITe_ig

**Writing Units**

Some units are written in a different way at A-Level compared with GCSE

For equations/quantities, where the quantities are multiplied together, eg:

- $\mathbf{Moment = force\ x\ (perpendicular)\ distance}$
- The units are multiplied and are written in the same way that you are familiar with:
- **Newtons** (unit of force) x **metres** (unit of distance)
- *Unit of a moment:* **N m**

For equations/quantities where one or more quantities are divided, eg:

- $\mathbf{Pressure} = \frac{\mathbf{force}}{\mathbf{area}}$
- **Newtons** (unit of force) ÷ **metres squared** (unit of area)
- At GCSE the unit would be written $N/m^2$
- *However, at A-Level, instead of using a division or "per" sign (/), any "per" units are written with a negative power so* **/m²** *becomes* **$m^{-2}$***:*
- *Unit of pressure:* **N $m^{-2}$**

Have a go at completing the table below with units you will have encountered before at GCSE

| Quantity | GCSE | A-Level |
|---|---|---|
| Area | $m^2$ | |
| Velocity | m/s | |
| Acceleration | $m/s^2$ | |
| Density | $kg/m^3$ | |
| Spring constant | | |
| Momentum | | |
| Specific heat capacity | | |