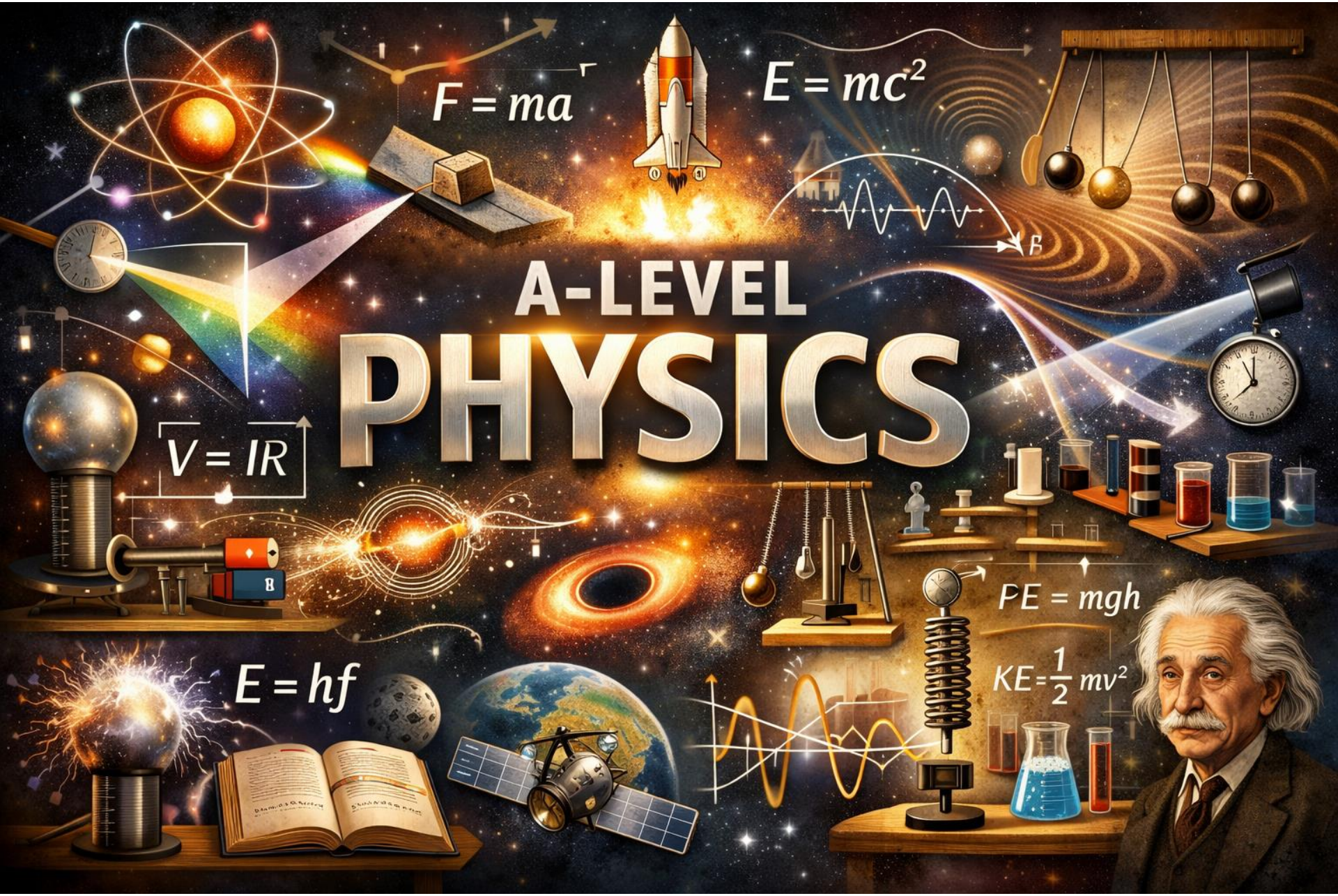

A-LEVEL
PHYSICS
F = ma
E = mc²
V = IR
E = hf
PE = mgh
KE = ½ mv²

Welcome to A-level Physics

Key Information

Edexcel Physics(A) A – level
10 x 50-minute lessons over a 2-week period
You will be loaned an Edexcel course book and folder for the course.
No coursework but there is a teacher assessed practical competency (CPAC) which comprises of a series of assessed practicals throughout the course.

Topics are:

Topic 1: Working as a Physicist
Topic 2: Mechanics
Topic 3: Electrical Circuits
Topic 4: Materials
Topic 5: Waves and Particle Nature of Light
Topic 6: Further Mechanics
Topic 7: Electric and Magnetic Fields
Topic 8: Particle Physics
Topic 9: Thermodynamics
Topic 10: Radioactivity
Topic 11: Gravitational Fields
Topic 12: Space
Topic 13:Oscillations

Year 12

Year 13

Welcome!

Examinations

Paper 1	Paper 2	Paper 3
90 Marks	90 Marks	120 Marks
1hr45	1hr45	2hr30
30% weighting	30% weighting	40% weighting
Topics 1-3, 6-8	Topics 1, 4,5, 9-13	Synoptic Paper

A-Level Physics at Newent School

Expectations:

1. You will take **responsibility for your own resources** (stationary/ notes/ textbooks/ revision materials)

2. If you are absent, it is **your responsibility** to catch up on work missed

3. **You must complete prior reading** before lessons to keep up with the pace of the course.

4. Any homework will need to be **completed to a good standard and handed in on time**

If you fail to meet expectations, study frees being taken from you to ensure that you catch up.

Materials Science

What has gone wrong?

What could have caused this?

Whose fault is it?!

Youngs Modulus

- Youngs Modulus is a measure of the **stiffness** of a material. It gives us an indication of how much force is required to cause an object to deform.
- Youngs Modulus is defined as

Stress (Pa)

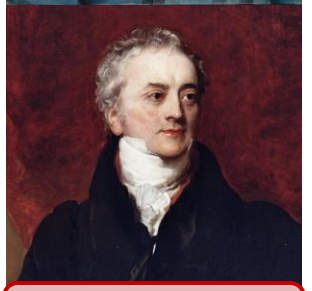
$$E = \frac{\sigma}{\varepsilon}$$

Young's Modulus (Pa)

Strain (no units)

- Before we can understand what this is and how it works, we need to define the two above terms.

Leonhard Euler
1707 - 1783



Thomas Young
1773 - 1829

Stress

- Stress, like pressure, is a measurement of the force per unit area exerted on a material.

Stress (Pa or Nm^{-2})

$$\sigma = \frac{F}{A}$$

Force (N)

Area(m^2)

Strain

- Strain is a measure of the **change in length** of a material under stress. It is defined as the **ratio** between the **extension** and the **original length**.

$$\varepsilon = \frac{\Delta x}{x}$$

Strain (no unit)

Extension (m)

Original Length (m)

Leonhard Euler
1707 - 1783

Thomas Young
1773 - 1829

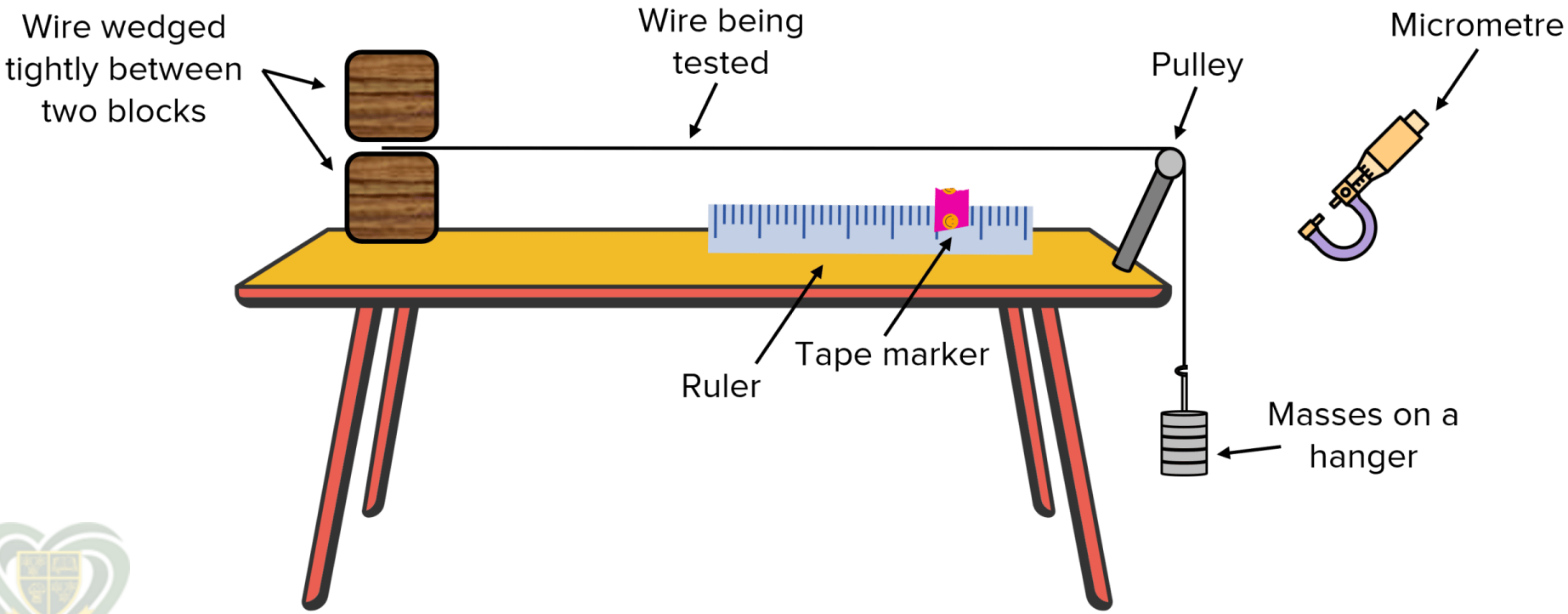
…and back to Young Modulus

$$E = \frac{\sigma}{\varepsilon}$$

- Now that we know what stress and strain are, can you come up with an equation linking the Young Modulus to Force, Extension, Length and Area?

Practical

- You need to finalise a method in your group (explain to me your safety considerations before starting).
- Record your results in an appropriate way.
- Present your result in a scientific way.



Now have a go at this....

The Young Modulus of a material can be expressed by the formula $E = \frac{Fx}{A\Delta x}$.

The derivation of this formula is

$$E = \frac{\sigma}{\varepsilon}$$

So $E =$?

And $E = \frac{Fx}{A\Delta x}$

Which of the following completes the second line of the derivation?

- ☐ **A** $\frac{\frac{x}{\Delta x}}{\frac{F}{A}}$
- ☐ **B** $\frac{\frac{\Delta x}{x}}{\frac{F}{A}}$
- ☐ **C** $\frac{\frac{F}{A}}{\frac{\Delta x}{x}}$
- ☐ **D** $\frac{\frac{F}{A}}{\frac{x}{\Delta x}}$

TIMER
2 MINS