Welcome to Physics!

OCR Physics A (H556)

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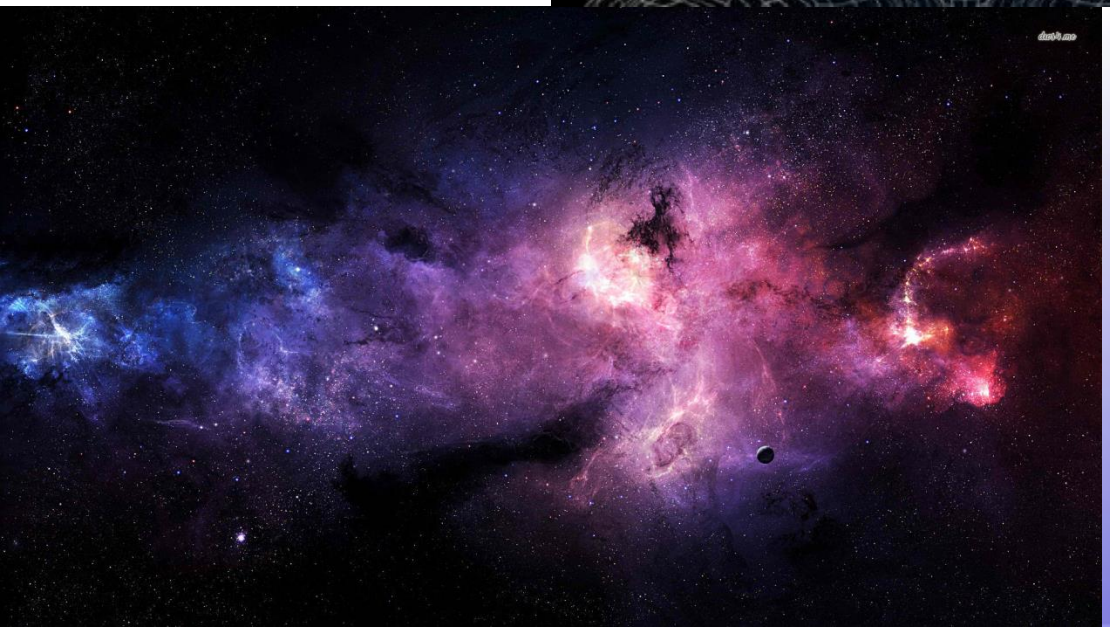
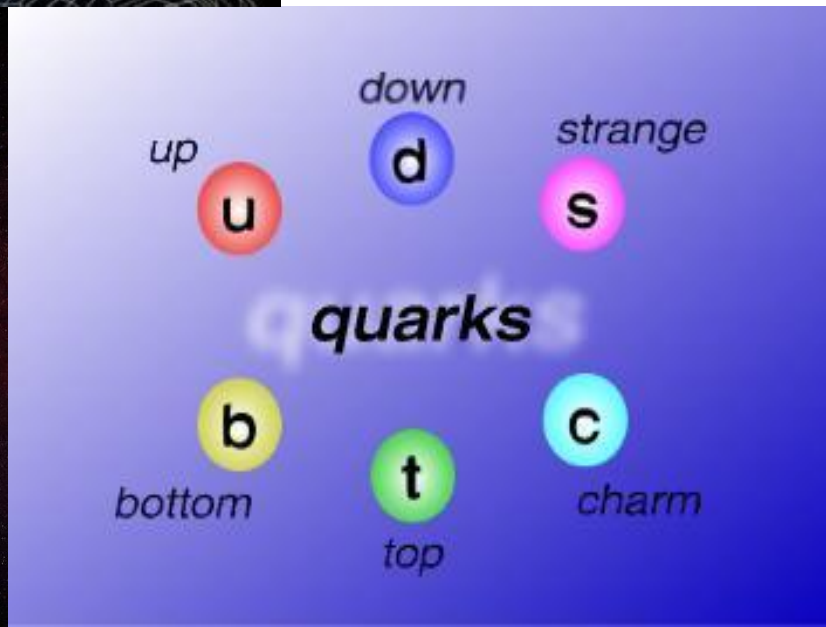


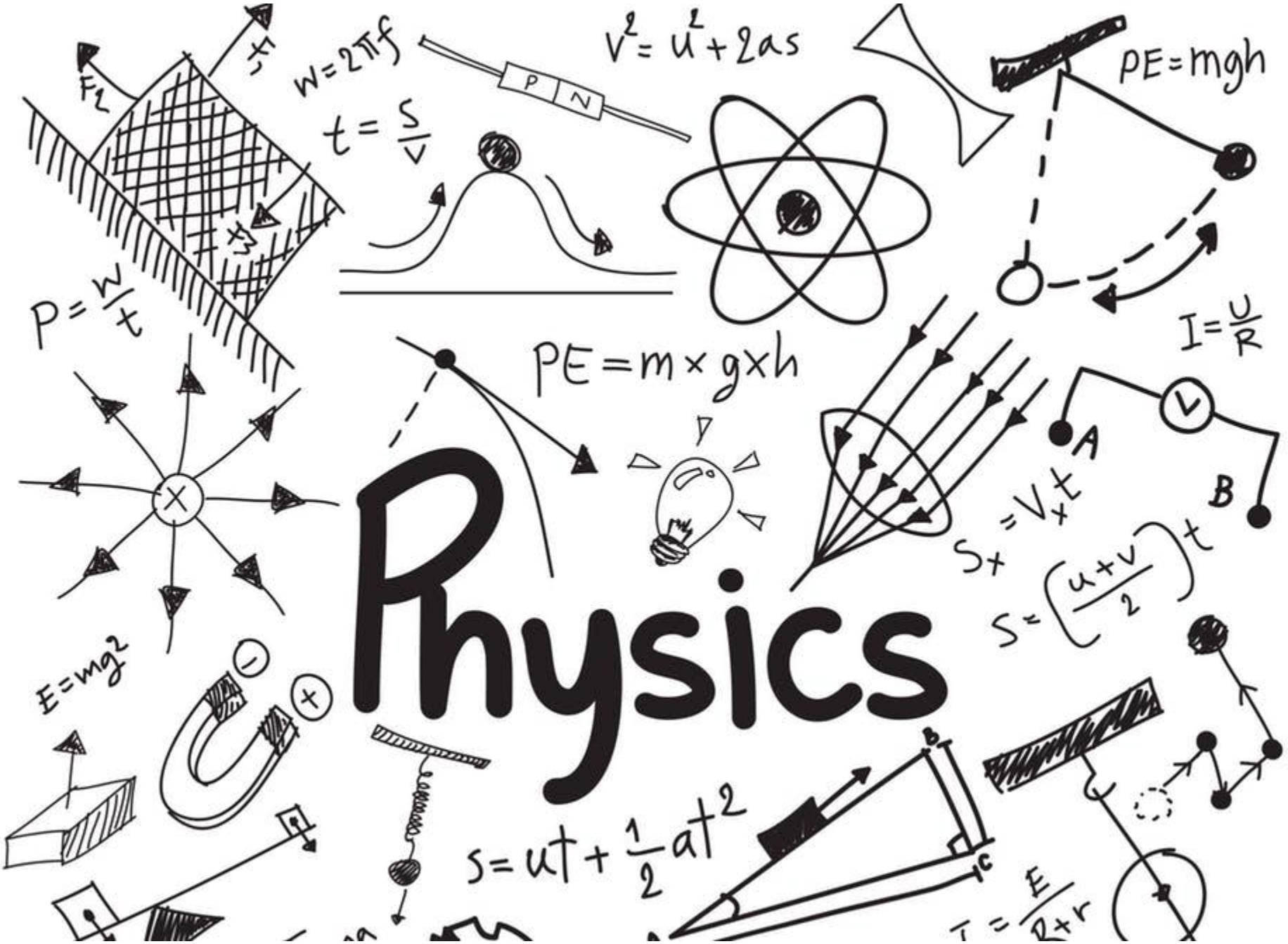


The Physics Department

- Mr Bain (Head of Physics)
- Mr Bramwell
- Ms Sossou

Course structure

- 6 modules
- 10 lessons a fortnight
- 2 teachers per group
- Curriculum map shows the order of the topics and assessments.


Physics
$w = 2\pi f$
$t = \frac{s}{v}$
$v^2 = u^2 + 2as$
$PE = mgh$
$P = \frac{W}{t}$
$PE = m \times g \times h$
$I = \frac{U}{R}$
$s = ut + \frac{1}{2}at^2$
$s = \left(\frac{u+v}{2}\right)t$
$E = mg^2$
P N
A
B
V

Accuracy and Precision

- Accuracy – the degree to which the obtained value is close to the true value.
- Precision – the degree to which repeated values show the same results.

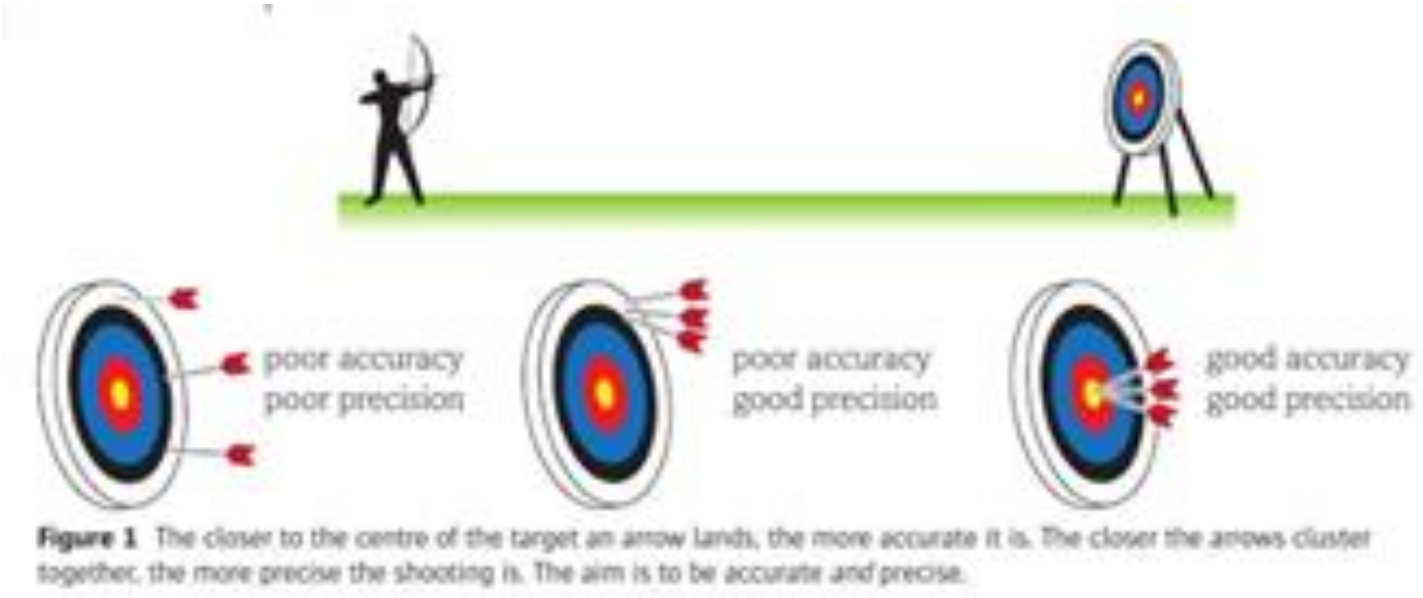


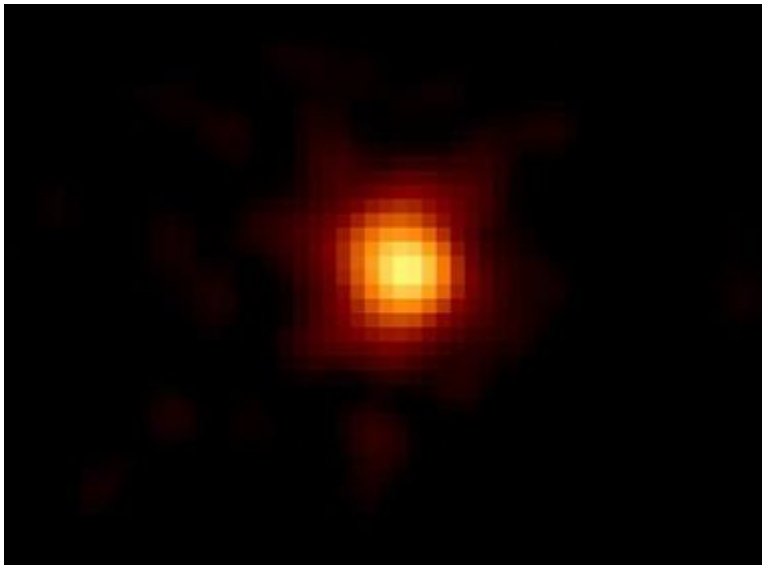
Figure 1 The closer to the centre of the target an arrow lands, the more accurate it is. The closer the arrows cluster together, the more precise the shooting is. The aim is to be accurate *and* precise.

Uncertainty

- How sure are you of a measurement or a result?

- How long is this pencil?

What are Uncertainties?



What do you think this is?

It is very old!

It is **GRB 090429B** and is thought to be the remnants of one of the first stars born after the Big Bang.

It is 13,140,000,000 ± 20,000,000 years old

Calculating Percentage Uncertainties

Reading on meter = 25.2 V

Finest division = 0.1 V

This is the absolute uncertainty **± 0.1 V**

$$\%\text{Uncertainty} = \frac{\text{Absolute Uncertainty}}{\text{Reading Taken}} \times 100$$

$$\%\ \text{Uncertainty} = (0.1/25.2) \times 100 = 0.4\ \%$$

Combining % Uncertainties

What happens in the formula	What to do to calculate uncertainties
$A \times B$ or $A \div B$	Add percentage uncertainty of A with percentage uncertainty in B
A^2	Double the percentage uncertainty of A
A^n	Multiply the percentage uncertainty by n

$A_1 + A_2$ or $A_1 - A_2$ Combine the absolute uncertainties before calculating the % uncertainty

Induction Lesson Practical Tasks

- Complete the different experiments around the room.
- Take measurements and calculate the percentage uncertainties in your measurements.
- Combine the percentage uncertainties to find the uncertainty in your calculated values.

Follow-up Summer Transition Tasks

DETAILS ON SCHOOL WEB SITE: Ensure you access the instructions

The following **compulsory tasks** must be completed before the first Physics lesson in September. Ensure you bring your work to your lesson so that it's completion can be checked. It is expected you will work independently, finding out any necessary information in order to carry out the tasks:

- **Foundations of Physics Calculation sheet: determining uncertainty**. *(A level Physics Summer Transition Tasks 2019 part 2).* This provides information and worked examples on uncertainties for you to read as well as questions for you to complete.
- **17 exam style questions** involving uncertainties *(A level Physics Summer Transition Tasks 2019 part 3).*
- **Research activity: PhET resistance in a wire simulation (instruction on this document - *A level Physics Summer Transition Tasks 2019 part 1*)**