



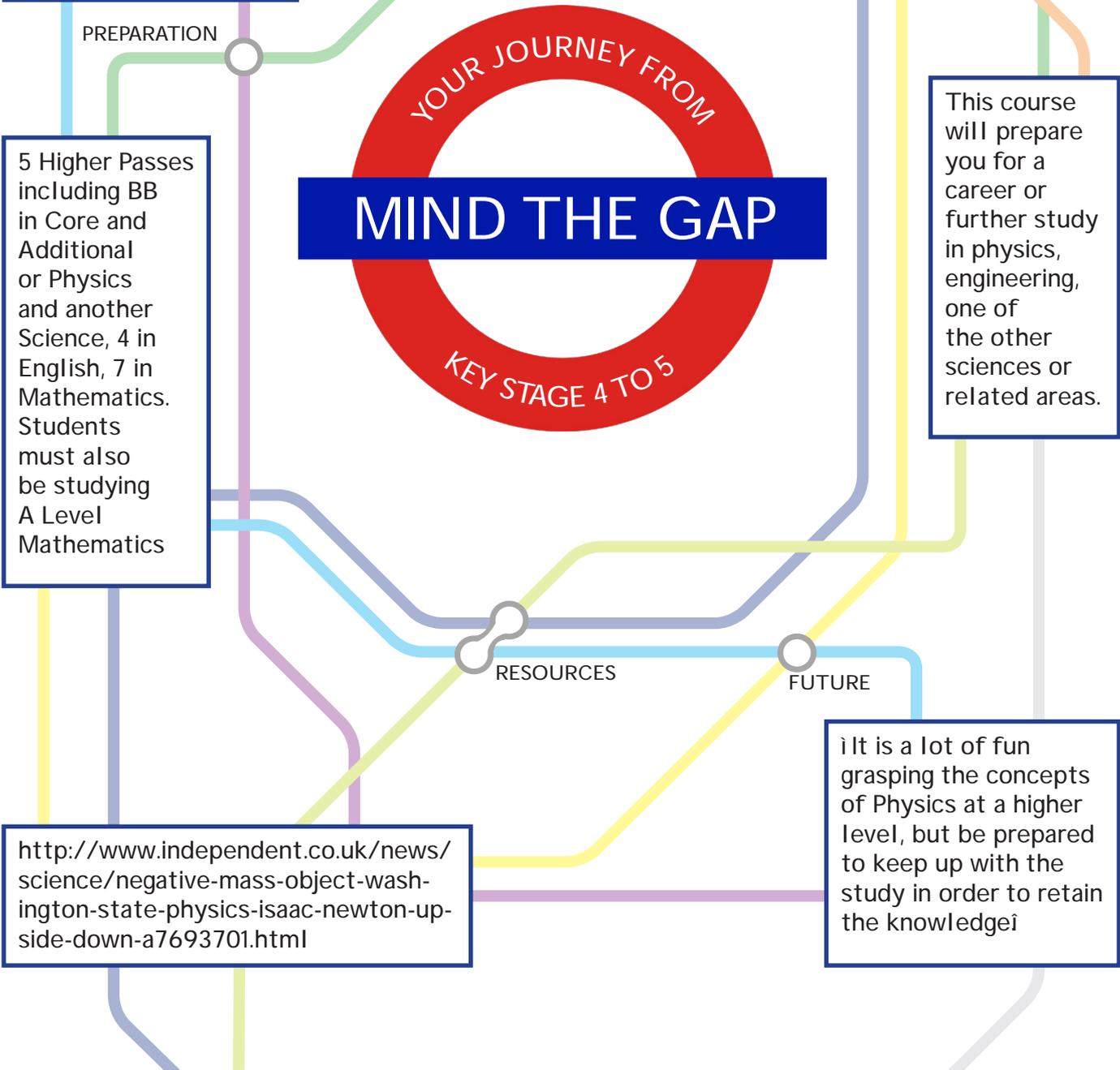
NAME:.....

PHYSICS



As challenging as the AS Physics course is it is also one of the most rewarding. The teachers offer great support to help you to progress further

<https://www.theguardian.com/books/2017/apr/19/the-ascent-of-gravity-by-marcus-chown-review>



5 Higher Passes including BB in Core and Additional or Physics and another Science, 4 in English, 7 in Mathematics. Students must also be studying A Level Mathematics

This course will prepare you for a career or further study in physics, engineering, one of the other sciences or related areas.

<http://www.independent.co.uk/news/science/negative-mass-object-washington-state-physics-isaac-newton-upside-down-a7693701.html>

It is a lot of fun grasping the concepts of Physics at a higher level, but be prepared to keep up with the study in order to retain the knowledge

THIS BOOKLET MUST BE COMPLETED IN FULL IN ORDER TO BEGIN THIS COURSE. THE BOOKLET AND ALL ADDITIONAL WORK SHOULD BE HANDED IN DURING THE FIRST LESSON IN SEPTEMBER.

SUBJECT OVERVIEW

Which exam board? OCR

Which style of qualification? Academic Route

Describe the specification units for Year 1 in this course

Motion, forces in action, work and energy, electric current, resistance, DC circuits, waves, quantum physics.

Describe the specification units for Year 2 in this course

Newton's law and momentum, circular motion and oscillations, thermal physics, electric and magnetic fields, capacitors and exponential decay, nuclear physics, medical imaging and modelling the universe.

Describe the Assessment Objectives for the course

Knowledge and understanding, Application and knowledge of understanding and How science works.

How will students be assessed for each unit in Year 1?

Final Examination

How will students be assessed for each unit in Year 2?

Final Examination

Styles of teaching and learning which operate in this subject

Group work, Independent Learning, Lecture, Practical, Presentations

To be successful in this course you will have and/or develop the following skills:

Mathematical skills and analysis of data.

EQUIPMENT LIST / RESOURCES

Stationary Scientific Calculator, sharpener

Software

Additional Items Course text book and revision guide

READING LIST



FICTION

Title	Author	Publisher
Resplendent	Stephen Baxter	
Tau Zero	Poul Anderson	
The Quantum Rose	Catherine Asaro	

NON-FICTION

Title	Author	Publisher
A Brief History of Time	Stephen Hawking	
For the Love of Physics	Walter Lewin	
The Pleasure of Finding Things Out	Richard P. Feynman	

OTHER (website/articles/programme/film...)

Title	Author	Publisher
Physics World	Journal	
New Scientist	Journal	
Scientific American	Journal	

LESSON 1

SUBJECT: PHYSICS

Induction Pack: Lesson 1 (1 hour)

Title: Electric Current

Skills to be learnt:

Drawing circuit diagram, Reading circuit diagram and building circuits

Additional resources: Practical equipments - series and parallel circuits.

Recall basic definitions of keywords in electricity from GCSE.

Recall the circuit symbols from GCSE.

Recall properties of series and parallel circuits from GCSE.

Broaden the definitions of keywords and their understanding.

Calculate how many electrons are passing a point when the electric current is 1 Ampere.

What is number density?

Why some materials are conductors, insulators and semiconductors?

Construct circuits (series and parallel).

Make observation and record them in result table. Evaluate the results and draw conclusions.

LESSON 1



SUBJECT: PHYSICS

Reflection from lesson: For students to fill in towards the end of the lesson. Responses should be articulate and define students' next steps in their learning

What did I learn?

What did I find challenging?

What do I need to go away and do?

LESSON 2

SUBJECT: PHYSICS

Induction Pack: Lesson 2 (1 hour)

Title: Mechanics measurement of g (acceleration due to gravity)

Skills to be learnt:

Graph plotting, calculation of gradient and hence calculate acceleration due to gravity

Additional resources: G- ball practical and ppt.

Students have prior knowledge of acceleration due to gravity in their GCSE syllabus. Generate responses from pupils about acceleration due to gravity:

What is g ? Does a body of smaller mass reach the ground quicker than larger mass thrown from the same height?

Demonstrate with slow motion video if pupils are not convinced.

But normally we don't notice this behaviour as there is air-resistance involved.

Conduct the g - ball experiment with the ball being dropped from different heights, time being measured with stop clock.

What are the sources of Uncertainties? Discuss how to calculate uncertainties

Pupils to tabulate their results and draw a graph of Height-----Time squared.

Calculate the gradient, ensuring that pupils draw big enough triangle. Calculate the gradient
Pupils evaluate their results.

LESSON 2



SUBJECT: PHYSICS

Reflection from lesson: For students to fill in towards the end of the lesson.
Responses should be articulate and define students' next steps in their learning

What did I learn?

What did I find challenging?

What do I need to go away and do?

LESSON 3

SUBJECT: PHYSICS

Induction Pack: Lesson 3 (1 hour)

Title: : Investigating Combinations of Resistors and their use in Potential Divider Circuits

Skills to be learnt:

Use of multi meters, Mathematical skill of rearranging equations

Additional resources: Practical equipments for Investigating Combinations of Resistors and their use in Potential Divider Circuits.

In this experiment you will be calculating the value of a number of different resistor combinations and then comparing these to an actual value taken from a multimeter reading. You will then study how the potential difference is distributed around the circuit and look to link this to the electrical properties of the components.

Procedure

Combining Resistors

Connect at least 3 resistors in a circuit and sketch the arrangement.

Calculate the effective value of the combination showing your working.

Measure the value of the combination using the multimeter.

Compare your calculation to the measured value.

Repeat the experiment so that you have one series combination, one parallel combination and three combinations including series and parallel arrangements.

Potential and potential difference across resistors in a circuit

Set up a circuit with 3 resistors in series and a voltmeter across each one.

Draw a full circuit diagram. Maintain the power supply output at 5V throughout the experiment.

Mark on the diagram the e.m.f. of the power supply, and the potential difference across each resistor.

LESSON 3



SUBJECT: PHYSICS

Reflection from lesson: For students to fill in towards the end of the lesson. Responses should be articulate and define students' next steps in their learning

What did I learn?

What did I find challenging?

What do I need to go away and do?

EXTENDED WRITING TASK

Write an essay on electric current in around 1000 words.

(You could use the try to link the following keywords with one another to help. You could reason and explore on what, why, where and how on these keywords. Keyword: charge carrier, current, potential difference, energy, resistance, number density, conductors etc.)

YSC TASK(S)



1. Explain electric current using analogy with diagram.
2. Explain what does the i stand for.
3. Identify the negative terminal of the supply and mark this as 0V. Mark the actual potential in volts at each connection in the circuit and explain how the terms potential and potential difference are linked.
4. Write a short story/paragraph on the experience of an electron in a circuit.
5. Draw circuit diagram of combination of resistors and their equivalent circuit diagram as the resistors are combined in stages (use your practical result tables to help you in this activity)
6. Design an experiment to measure the acceleration due to gravity.

SUPPORTING GLOSSARY

(not exhaustive)

CHARGE

ELEMENTARY CHARGE

CHARGE CARRIERS

ELECTRIC CURRENT

VOLTAGE/POTENTIAL DIFFERENCE

CONDUCTOR

INSULATOR

SEMICONDUCTOR

NUMBER DENSITY

FORCE

ACCELERATION

GRAVITY

GRAVITATIONAL FIELD STRENGTH

ACCELERATION DUE TO GRAVITY