# Summer Induction Work

## Physics



HAZELEY 6TH FORM

CHARACTER, CONFIDENCE & CREATIVITY

Deadline: Friday 11th September

The Hazeley Academy

# AS Physics Summer Transition Work 2020

# DEADLINE DATE: Friday 11<sup>th</sup> September 2020

You will be studying OCR A, this is a new specification which will be assessed after two years through 3 exam papers and 12 in class practical assessments. Y**our summer work focuses on content covered in Paper 1.**

**Learning objectives:**
1. **To be able to describe physical quantities in terms of units measurements.**
2. **To be able to apply knowledge to exam questions on the nature of quantities.**
3. **To use exam questions to apply knowledge on motion.**

**Task 1 (suggested time 30mins) – Does not contribute to final mark but completion will be checked**

Independent organisation – *Folders will be checked in your first lesson*

Create a Physics Folder with 4 main sections

1. Development of Practical skills in physics
2. Foundations of Physics
3. Forces and Motion
4. Electrons, Waves and Photons

Within each section you need these sub-sections

1. PLC (You will be given these at the start of term, to RAG after completing summer homework, to help you to identify intervention needed)
2. Notes
3. Exam questions

**Task 2: Development of Practical skills in physics (suggested time 30 mins) 10% of Final Mark**

Spec points covered in this section: 1.1.1, 1.1.2 (practical techniques)

**Task:** Research and extended writing – The last question of the exam often requires the description of an experiment to support a theory.

*Describe and explain* how you would carry out an e*xperiment* for one of the following:   (10 marks)

- A student suggests that if an egg was dropped from different heights the area of splatter would increase as the height increases but only until a certain point. How could you investigate this?

- Is the flight time of a paper plane directly proportional to the angle of the nose ($\theta$), the sine of the angle ($\sin\theta$) or neither?

- What is the relationship between the time that a fizzy pop bottle is shook up for and the volume of liquid that is lost when the bottle is opened?

- How could you investigate the theory that the surface temperature of a resistor is directly proportional to the current flowing through it?

- How could you investigate the connection between the temperature at which a resistor stops obeying Ohm's law and the value of the resistor?

- Water is placed in a plastic tray, one end it raised, dropped and the speed of the water wave is measured. A student suggests that the speed of the wave depends on the height of the water in the tray. How could you prove this?

- A cylinder of solid metal is rolled down a ramp and the speed is calculated from the distance rolled and the time taken to roll. There is a suggestion that if the cylinder was hollow it would be affected more by the air resistance. How could you investigate this?

- How could you investigate whether or not the critical angle of a Perspex block is affected by the colour of light that is incident on the block?

## Task 3: Foundations of Physics (suggested time 6 hours) 35% of Final Mark

**SPEC points covered in this section: 2.1.1, 2.1.3, 2.1.4, 2.1.5,1.1.3, 1.1.4, 1.1.5, 1.1.6, 2.2.1, 2.2.2, 3.1.1, 3.1.2, 3.1.3 (Mechanics and Newtonian Physics)**

Create a student log in for Isaac Physics (https://isaacphysics.org/).

Join the class group using one of the following two methods:

- Go to "My Account" and then click on the "Teacher Connections" tab. Enter the code KW4DTG.
- Enter the following link on your browser: *https://isaacphysics.org/account?authToken=KW4DTG*

Complete each of the 4 assignments in that group.

## Task 4: Online course: (suggested time 15 hours) 35% of final mark

Choose from the following courses from the Open University Open Learn programme (https://www.open.edu/openlearn/free-courses/full-catalogue) to explore an area of Physics (or related discipline) that is of interest to you and your future studies/career. You need to complete at least 15 hours of study and can choose one longer course or a combination of shorter courses. Send the completion confirmations to dofosu@thehazeleyacademy.com or bring a printed confirmation at the start of term.

- Particle Physics (5 hours - Introductory level)
- Introducing Engineering (15 hours - Introductory level)
- The Big Bang (20 hours - Advanced level)
- Collisions and conservation laws (5 hours - Intermediate level)
- Comparing stars (16 hours – Intermediate level)
- Describing motion along a line (15 hours – Intermediate level)
- Dynamics (16 hours – Intermediate level)
- Introduction to electronics (10 hours – Intermediate level)
- The restless universe (12 hours – Intermediate level)

Below are some books worth reading **BEFORE** the start of the course.

Your Task is to read <u>one</u> of these and there write a review that you will discuss in class.  Your review should be ideally 800 words in length and should cover the following points:

- A short summary of what the book is about
- Highlight any ideas that you found interesting and **why** they were of interest to you.
- Similarly highlight any ideas that you did not find interesting and why they did not appeal to you.
- Any social context, such as how does this help with life or the modern world?
- Finally explain whether you liked this book or not and what insight you may have gained from it to do with Physics.

The book list includes:

- Schrodinger's Kittens. John Gribbin                    **ISBN-10:** 1857994027
- The Physics of Star Trek. Laurence Krauss              **ISBN-10:** 0006550428
- A Short History of Nearly Everything.  Bill Bryson     **ISBN-10:** 0552562963
- In Search of the Big Bang. John Gribbin                **ISBN-10:** 1511910089
- The New Science of Strong Materials. J.E.Gordon        **ISBN-10:** 0140135979
- Cosmos. Carl Sagan                                     **ISBN-10:** 0349107033
- How to clone the perfect blonde. Nelson & Collingham   **ISBN-10:** 0091897475
- Unweaving the rainbow. Richard Dawkins                 **ISBN-10:** 0141026189
- A Briefer History of Time. Stephen Hawking             **ISBN-10:** 0593056973
- The Physics of Superheroes. James Kakalios             **ISBN-10:** 0715639110


**Useful Books/websites for helping you with the summer work.**

https://www.physicsandmathstutor.com/

**http://www.s-cool.co.uk/a-level/physics**

**http://www.cyberphysics.co.uk/**

**http://www.school-for-champions.com/physics.htm**

**Head Start to A-level Physics (CGP A-Level Physics)**

**A-Level Physics: OCR A Year 1 & 2 Complete Revision & Practice with Online Edition (CGP A-Level Physics)**

**Submission date Friday 11th September 2020**