



ETTONBURY
ACADEMY

A Level Physics

Summer Bridging Work

A-level Physics

Studying physics gives insights into the fundamental way the world works. From interstellar movements to the quantum realm, A level physics will broaden your understanding of the universe we live in. If you want a fulfilling, interesting and challenging A level then physics is definitely for you. It's basically the study of everything, and the perfect place to start questioning and challenging preconceptions.

Subject content for the course can be found here:

<https://www.ocr.org.uk/qualifications/as-and-a-level/physics-a-h156-h556-from-2015/specification-a-t-a-glance/>

Course prerequisite

In order to ensure you have the required work ethos necessary to succeed on the A-level physics course, you must complete the tasks below and bring your completed answers to the first physics lesson in September.

Before starting in September, you should read an article about physics or a popular science book and come ready to discuss this in your first lesson.

Below you will find a vast list of books, magazines, journals and websites that would be great for expanding your knowledge of physics.

Books

- Bill Bryson:
 - A short History of Nearly Everything
- NewScientist:
 - Why don't penguins' feet freeze?
- Stephen Hawkin:
 - The Grand Design
 - A brief history of time
- Brian Cox and Jeff Forshaw:
 - The Quantum Universe: Everything that can happen does happen
- Jim Al-Khalili:
 - Paradox
 - Life on the Edge
- Randall Munroe:
 - What if?

Magazines/journals

- Physics World
- Scientific American
- New Scientist

Places of Interest

- Science Museum, London
- The planetarium, Greenwich observatory, London
- The national space centre, Leicester

Websites

- 1) www.iop.org
- 2) www.physicsworld.com
- 3) <http://home.web.cern.ch/topics/large-hadron-collider>

Task 1 – About the A-level course

Go to the exam board website and find out about the course you will be studying (I recommend the 'specification at a glance' page.)

1. What are the different modules in the course?

2. Looking at the content overview of each module, which topics are you most excited to learn about?

3. Which topics are you most nervous about?

4. How many exams will you sit at the end of year 13, and what percentage is each worth?

5. How is practical work assessed?

Task 2 - 30 mins

Read the information on Units and Homogeneity. Follow the link.
Watch the YouTube clip on the same subject.

Information – Units and Homogeneity

https://en.wikibooks.org/wiki/OCR_ALevel_Physics/The_SI_System_of_Units

Youtube clip

<https://www.youtube.com/watch?v=ZXnHzGcOhGQ>

Task 3 - 1 hour

Read the two articles about the feasibility of a space elevator. They explore the idea of a link between the Earth and space, an 'elevator', that would improve space exploration. This will develop your skills to both support and argue against a hypothesis.

<https://www.snexplores.org/article/can-we-build-space-elevator-tall-tower-or-giant-rope>

Write a short paragraph explaining whether or not you think this is a feasible concept.

Task 4 - 1 hour

Listen to this podcast about some pressing physics questions like: why do some parts of the moon appear darker than others; what is the large hadron collider for and what can quantum computers do for science?

Dr Karl: The Moon, Particle Physics and..

<https://www.bbc.co.uk/programmes/p07tyjvw>

Task 5 - 1 hour 20 mins

Watch the TED talks. Five mind bending questions from Physics. Each one lasts between 15 to 20 minutes.

Mind-bending questions from physics

https://www.ted.com/playlists/475/mind_bending_questions_from_ph

Task 6 - 30 mins

Watch the information on Scalars and Vectors. Make sure that you pause the videos as you go, make notes and copy down any examples done.

<https://www.youtube.com/watch?v=VNB8E29K6DY>

<https://www.youtube.com/watch?v=iTqbdtMnk0A>

Task 7 - 1 hour

Complete a profile on Isaac Newton and Christian Huygens. Include information on their background, their individual theories on light and what evidence they gathered. Compare the two theories and explain the significance of their theories on science

Task 8 - 50 mins

Listen to this podcast about Paul Dirac, a Bristolian theoretical physicist, ranked alongside Einstein by his peers, who won a Nobel for his work on quantum mechanics.

<https://www.bbc.co.uk/programmes/m000fw0p>

Task 9 - 1 hour

Submitted task: Create a fact sheet about Newton's 3 Laws of Motion. For each law, include:

- A formal explanation of the law along with your own, simplified explanation
- A practical example of how this law works in everyday life.
- A photo/labelled diagram showing the practical example.

While conducting your research you should keep track of what sources you use and make a list of these references at the bottom of your work.

Bring the Fact sheet with you to your first Physics lesson in September

Task 10 - 1 hour

Complete the task on Units and Homogeneity of equations. Follow the link below.

Task Sheet – Units and Quantities

<https://pmt.physicsandmathstutor.com/download/Physics/A-level/Topic-Qs/OCR-A/2-Foundations-of-Physics/Set-M/Physical%20Quantities%20and%20Units%20QP.pdf>

Task 11 - 1 hour

Complete the task sheet on Scalars & Vectors. Follow the link below.

Questions – Scalars and Vectors

<https://pmt.physicsandmathstutor.com/download/Physics/A-level/Topic-Qs/OCR-A/2-Foundations-of-Physics/Set-M/Nature%20of%20Quantities%201%20QP.pdf>