

YEAR 12 – BRIDGING UNITS

# A-LEVEL PHYSICS

BRIDGING  
UNITS

Name:

Anything is

POSSIBLE



ST HILDA'S  
COLLEGE

The 6<sup>th</sup> Form  
@ St Hilda's

# A-LEVEL PHYSICS



You are about to start an exciting journey into the world of Physics, good luck!

## **Remember**

- Choose what modules you do and when, but work through them consistently. Different tasks will take you varying amounts of time, but on average you should aim to do one or two per week
- All green tasks are core modules, they are compulsory and must be completed and brought to your first physics lesson.
- Numbers eg (1) correspond to how you should evidence the module which can be found in the slides following the menu.



# Physics Bridging Menu

The baseline test is a compulsory module, the others are optional to expand your knowledge base

YEAR 12 – BRIDGING UNITS  
A-LEVEL PHYSICS

Read	Watch	Listen	Visit (virtually or at a later date)	Do
<p><b>Brief Answers to the Big Questions</b> <i>In his last book, Stephen Hawking turns his attention to the most urgent issues for mankind: from climate change to artificial intelligence. (1)</i></p>	<p><b>TED Talks (2)</b></p> <ul style="list-style-type: none"> <li><a href="#">The fascinating physics of everyday life</a></li> <li><a href="#">Quantum Physics for 7 year olds</a></li> <li><a href="#">Battling Bad Science</a></li> </ul>	<p><a href="#">The Curious Cases of Rutherford and Fry podcast (1)</a></p>	<p>A <b>university open day</b> (or virtual tour) of a university you are interested in. Here is the <a href="#">Oxford Physics Department</a>. (3)</p>	<p><b>Review GCSE content</b> Use your personal learning checklists to fill any gaps in knowledge. The A level course builds upon GCSE. (5)</p>
<p><b>Articles on <a href="https://physicsworld.com/">https://physicsworld.com/</a></b> Many articles about the latest happening in the world of Physics. (1)</p>		<p><a href="#">No Such Thing As Fish podcast (1)</a></p>		
<p><b>Seven Brief Lessons on Physics</b> <i>These seven short lessons guide us, with simplicity and clarity, through the scientific revolution that shook physics in the twentieth century and still continues to shake us today. (1)</i></p>	<p><b>Astronauts- Do You Have What It Takes (BBC)</b> <i>In this factual documentary series, 12 exceptional applicants have been chosen out of thousands to find out if they have what it takes to become an astronaut. Follow their journey as they are put to the test to see if they can go to space! (1)</i></p>	<p><a href="#">Infinite Monkey Cage podcast (1)</a></p>	<p><b>Royal Intuition Public Lectures (4)</b></p>	<p><b>MOOCs</b> <a href="https://www.futurelearn.com/">https://www.futurelearn.com/</a> Search through the MOOCs on Unifrog using the filter 'Physics' and chose one that particularly interests you (6)</p>
<p><b>Why Does <math>E = mc^2</math>?</b> <i>What does <math>E=mc^2</math> actually mean? Dr. Brian Cox and Professor Jeff Forshaw go on a journey to the frontier of twenty-first century science to unpack Einstein's famous equation. Explaining and simplifying notions of energy, mass, and light-while exploding commonly held misconceptions-they demonstrate how the structure of nature itself is contained within this equation. (1)</i></p>		<p><a href="#">Audio archives from the Institute of Physics (1)</a></p>	<p>Visit the <b>National Physics Laboratory (4)</b></p>	
<p><b>Quantum Theory Cannot Hurt You</b> <i>Marcus Chown breaks down Einstein's general relativity and quantum theory. (1)</i></p>		<p><a href="#">Royal Institution Christmas Lectures (1)</a></p>	<p><b>Diamond Particle Accelerator</b> in Oxfordshire (<a href="#">virtual tour also available</a>) (4)</p>	
	<p><b>Interstellar</b> <i>In Earth's future, a global crop blight and second Dust Bowl are slowly rendering the planet uninhabitable. Professor Brand, a brilliant NASA physicist, is working on plans to save mankind by transporting Earth's population to a new home via a wormhole. (1)</i></p>	<p><a href="#">Audiobooks available to listen free here:</a></p> <ul style="list-style-type: none"> <li>A short History of Nearly Everything</li> <li>The Theory of Everything</li> <li>Surely, you're joking Mr Feynman!</li> <li>Six Easy Pieces</li> <li>The Elegant Universe (1)</li> </ul>	<p><b>Museum at the Cavendish Laboratory (4)</b> (<a href="#">virtual tour here</a>)</p>	<p><b>Complete the "Transition Test" booklet. This must be completed and brought to your first physics lesson.</b></p> <p>(5)</p>
	<p><b>The Theory of Everything</b> <i>Stephen Hawking, an excellent astrophysics student working on his research, learns that he suffers from motor neurone disease and has around two years to live. (1)</i></p>	<p><a href="#">In Our Time podcast (1)</a></p>	<p><b>Science Museum (4)</b> (<a href="#">virtual tour here</a>)</p>	
				<p>Anything is <b>Practice Physics Olympiad past papers</b> An annual competition seeking out the best physicists across the country. (7)</p>



ST HILDA'S COLLEGE

The 6<sup>th</sup> Form  
@ St Hilda's

POSSIBLE

# (1) – Book/Article/Journal/Podcast/Film Review

Review by: \_\_\_\_\_  
Title: \_\_\_\_\_  
Author: \_\_\_\_\_  
Review of (please circle)  
Book Article Journal Podcast Film Documentary

Would you/would you not recommend it? Why?

Rating:



What was it about?

What did you find particularly interesting/inspiring/shocking? Has this changed your opinion?

How does it link to this subject and why is it important?

What would you like to learn more about?



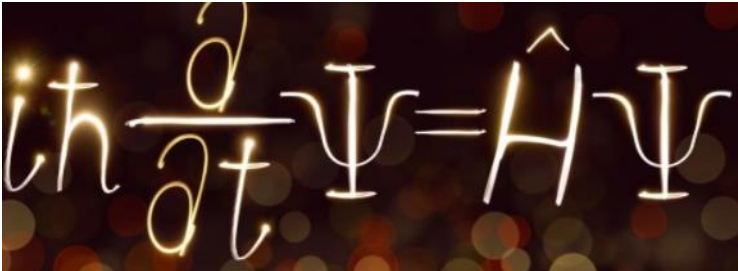
ST HILDA'S  
COLLEGE

The 6<sup>th</sup> Form  
@ St Hilda's

POSSIBLE

## (2) Questions on Ted Talks

1. What is quantum physics?
2. What are some of the phenomena of quantum physics?
3. Can you explain wave particle duality in more detail? (We learn about this in the first month of A-level Physics)
4. What is quantum tunnelling?
5. How does the sun generate energy?
6. What is superposition? (we also learn this in Y12)
7. When is quantum physics useful to us in our everyday lives?
8. Research: find out what the equation in the below picture means and why it's so important in physics.


$$i\hbar \frac{\partial \Psi}{\partial t} = \hat{H} \Psi$$



Anything is

POSSIBLE



ST HILDA'S  
COLLEGE

The 6<sup>th</sup> Form  
@ St Hilda's



## (3) Questions on a visit to a uni open day/research

1. What is the first year like on the BSc Physics Programme?
2. What can I expect over the three/four years?
3. How important is maths for a Physics Degree?
4. What job opportunities does a degree in Physics offer?
5. What percentage of the course is practical?
6. What is unique about Oxford (or the university you visit)?
7. What do Oxford (or the university you visit) look for in applicants?
8. What are the alternative courses you can do with a Physics A-level?



Anything is

POSSIBLE



ST HILDA'S  
COLLEGE

The 6<sup>th</sup> Form  
@ St Hilda's

# (4) Review of Visit

Review by: \_\_\_\_\_

Location: \_\_\_\_\_

Would you/would you not recommend visiting? Why?

Rating:



What does the location specialise in? Why is it well known?

Did you find out anything new that you had previously not known?

What was the most fascinating section of the museum/laboratory?

What would you like to learn more about?



ST HILDA'S  
COLLEGE

The 6<sup>th</sup> Form  
@ St Hilda's

BLE

## (5) GCSE Review and Maths Skills

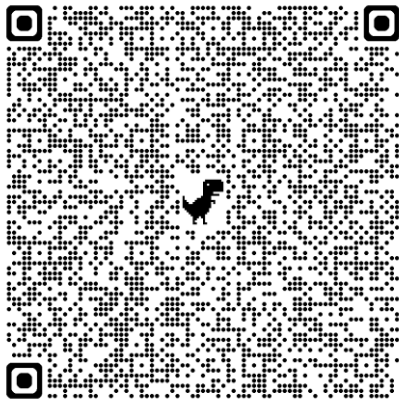
Use Edexcel A Level Physics specification to review GCSE content that overlaps with A-level. This is content you must be familiar with when you start as it will not be recapped.

Create cue cards for these topics to help you remember.

Make mind maps to show how your knowledge across each module of the GCSE links together.

Use BBC Bitesize or [ScienceShorts](#) on YouTube.

**Complete the baseline test booklet uploaded – bring this  
on your first day back**  
[Physics Transition Paper.pdf](#)



Anything is

POSSIBLE



ST HILDA'S  
COLLEGE

The 6<sup>th</sup> Form  
@ St Hilda's



# (6) MOOC's

These are massive open online courses that you can take whilst you are at home. Most are completely free to complete with a small fee for the certificate (but you do not need to print this - you can screen shot the completed stage).

To evidence this you can

Save any notes you take

Take and save a screenshot of completed modules or the completed course

FutureLearn

Subjects ▾ Courses ▾ Using FutureLearn ▾

Search online courses

Keep learning, wherever you are

## Stay connected

Is coronavirus affecting your education or work? Explore online courses to continue studying, build professional skills, and connect with experts.

[View courses](#)

Anything is

POSSIBLE



ST HILDA'S  
COLLEGE

The 6<sup>th</sup> Form  
@ St Hilda's

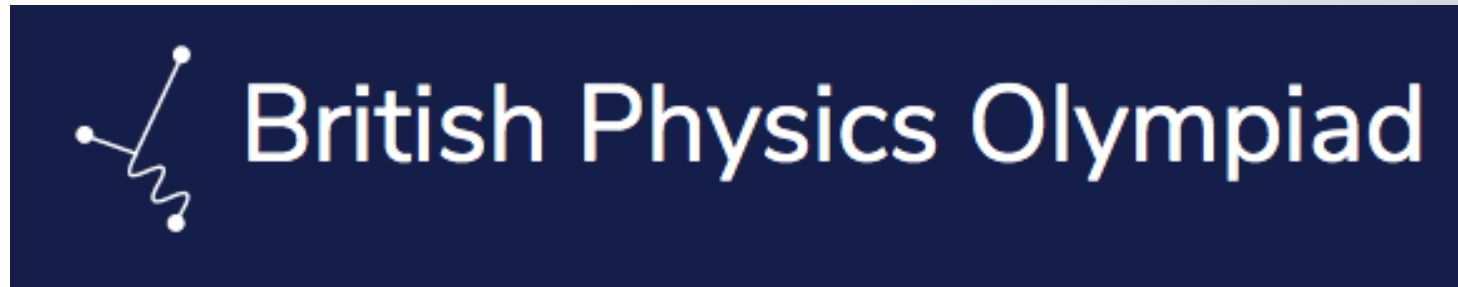
## (7) Physics Olympiad Challenge

These challenges will stretch your physics knowledge and make you think outside the box. Try some of the past paper questions here.

The [Intermediate Physics Challenge](#) is aimed at the top end GCSE students.

Go even further and try the [Senior Physics Challenge](#), aimed at the top end Y12 students.

Save your work/take a photo of your work and upload to your locker.



Anything is

POSSIBLE



ST HILDA'S  
COLLEGE

The 6<sup>th</sup> Form  
@ St Hilda's