# **Physics: Preparation for A-Level**

### Revise

### As you will be building on your GCSE knowledge, it is very important that you review your understanding of Mechanics, Electricity and Waves. Isaac Physics is an excellent resource that is aimed at developing your problem- solving skills. Click on the link below to sign up if you have not already got an account:

[Registration — Isaac Physics](https://isaacphysics.org/register)

You will then need to add the code HV38EE to Teacher connections to access the resources that have been set as ‘tests’ or alternatively use the link <https://isaacphysics.org/account?authToken=U8LJDM> . Complete the questions as listed under Tests. Show all working clearly on paper and be prepared to show your teacher in September.

If you have found any topics harder, it is important that you work through the revision material available here [GCSE Physics Lessons — Isaac Physics](https://isaacphysics.org/pages/gcse_topic_index?stage=a_level#gcse_revision).

### Do

Measuring techniques and being able to estimate quantities play a very important part in the A level Physics course. So here are a few tasks to do over the summer break. Describe your method in detail and include step by step calculations.  
**Be prepared to bring this work in and talk about it at the start of next term.**

## There are some hints at the end if you get really stuck##

1. In the fairy tale, Rapunzel plaited her hair into a rope and lowered it down from the tower in which she had been kept prisoner, thus allowing the gallant knight to climb up and rescue her.

Assuming she had a genetic defect that allowed her hair to grow to this length, would the hair rope have been strong enough?

You will need to test the strength of one hair. You will then need to estimate the number of hairs on a human head to help answer this question. Remember to show all your working out and state any assumptions that you have made.

1. Using objects you can find in the kitchen, measure the density of water. Explain how you did this and show all working.
2. Measure as accurately as you can the thickness of a page from a dictionary or a catalogue book. Again, explain how you did this and show all working.
3. Estimate the height of your house. Explain how you did this. Do not attempt to measure it!
4. Work out how long your average foot step is using Google maps.

### Read

You have chosen to study Physics because you enjoy it; so what could be better than a good holiday read? The following books, which are out in paperback are very entertaining and thoroughly recommended.   
They are a bit like an adult version of the ´Horrible Science´ series of books! Please read one:

* ´A Brief History of Nearly Everything´ by Bill Bryson - this is a mixture of all 3 sciences, but each chapter stands on its own, so pick out the Physics sections or better still read it all!
* ´Big Bang´ by Simon Singh
* ‘The world according to Physics’ by Jim Al Khalili
* ‘A Brief History of Time’ by Stephen Hawking
* ‘Storm in a Tea cup’ by Helen Czerski

You can download the ´GCE Physics A´ H556 syllabus from the OCR exam board web site: <https://www.ocr.org.uk/qualifications/as-and-a-level/physics-a-h156-h556-from-2015/>

Hints  
1Attach various small objects to one hair until it breaks, then use a kitchen balance.  
5Use the scale on the map and compare it to real life