

Year 12 into Year 13 – Physics

There are two activities for you to complete as part of your transition work.

Activity 1: Materials presentation

Introduction

This piece of work is intended to introduce the skills of researching and referencing information from books, journals and the internet. The topic links the study of materials and their properties with practical applications of the material.

Aim

To produce a suitable (e.g. Powerpoint) presentation of up to ten slides, detailing how the internal structure of a material gives rise to **a specific property** of the material, continuing to detail **how this specific property then makes the material suitable** for a particular application.

Your report should include information found by research in books, journals or on-line, along with appropriate references allowing the reader to locate the sources of information. The Practical Skills Handbook contains guidelines on the Harvard and Vancouver referencing systems which should be used and can be found on this website:

<http://www.ocr.org.uk/Images/295483-practical-skills-handbook.pdf>

Intended class or independent learning time

- 60 to 90 minutes

Equipment available

- Resources: books, journals, internet access

Procedure

- Research your chosen material and its application.
- Produce a Powerpoint presentation of up to ten slides. You should have also have maintained contemporaneous notes of your research
- You may include relevant information taken from resources, but you must appropriately cite the sources of any information that you quote or use.

- Present the information to your class colleagues and teacher in a suitable manner.
- You will be doing a 5 minute presentation on the first week of your Physics lesson. You need to ensure that your PowerPoint is available on a USB stick on the first lesson in Year 13.

Recording

As evidence you should have a Powerpoint (or similar) presentation that meets the brief. You should also have maintained contemporaneous notes of your research and references to the sources used. All work should be clearly dated.

You should ensure that you reference your work appropriately as below and that you do not just use the textbook as a source of your research.

Books

General reference format:

Authors (year), *Title*, edition (if relevant), publisher's location, publisher

For example:

Young, H., Freedman, R. (2004). *University Physics with modern physics*, 12th ed., Boston, Addison Wesley

For books that have an editor or editors, include (ed.) or (eds) after the names.

If a book does not have named authors or editors, the reference begins with the title, e.g.:

CLEAPSS Laboratory Handbook (2001), Uxbridge, CLEAPSS School Science Service

Journal articles

General reference format:

Authors (year), 'Article title', *Journal title*, vol. no, issue no, pp. xxx–xxx

For example:

Aad, G, et al (2012), 'Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC' *Physics Letters B* vol 716, no 1, pp 1-29

Websites

General reference format:

Authors (year), *Title*. [online] Last accessed date: URL

For example:

Dianna Cowern (2015), *Crazy pool vortex* [online] Last accessed 22 April 2015:
<https://www.youtube.com/watch?v=pnbJEg9r1o8>

Webpages and online resources frequently do not have individual authors. In that case, the name of the organisation is given.

Similarly, it is often not possible to find the year in which online material or documents were produced. In that case, use the year in which the information was sourced.

Institute of Physics (2015), *Three alternative ways to charge your iPod* [online] Last accessed 22 April 2015: <http://www.physics.org/featuredetail.asp?id=34>

If no author or organisation can be found, reference the website by title. However, in that case due consideration should be given as to whether the website is a trustworthy source!

Activity 2: Required Practical

Complete all the twenty sets of experiments below ensuring that you write no more than half a page of A4 for each. If applicable you can also include diagrams in addition to the half a page of writing. *Please ensure that your work is neat.*

1. Describe an experiment using an electromagnet, trapdoor and a ball bearing to find the value of the acceleration due to gravity.
2. Describe an experiment to find the centre of gravity of an irregularly shaped piece of card.
3. Describe an experiment to investigate how the velocity of an object changes when it falls in a fluid.
4. Describe an experiment to find the density of an irregular piece of rock.
5. Describe an experiment to check if the force applied to a spring is proportional to the extension of the spring.
6. Describe an experiment to find Young's modulus.
7. Describe an experiment using a potentiometer to investigate the IV characteristic of (a) a filament bulb (b) a diode
8. Describe an experiment to find the resistivity of a wire.
9. Describe an experiment to find how the resistance of an LDR changes with the intensity of light received.
10. Describe an experiment to investigate Kirchhoff's first law.
11. Describe an experiment to investigate Kirchhoff's second law.
12. Describe an experiment to find the internal resistance of a battery.
13. Describe an experiment to show that light is polarised.
14. Describe an experiment to show that microwaves are polarised.
15. Describe an experiment to find the refractive index of glass and its critical angle.
16. Describe an experiment to show the interference of sound.
17. Describe an experiment to determine the wavelength of light from a laser.
18. Describe an experiment that can be used to determine the wavelength of microwaves.
19. Describe an experiment to determine the value of Planck's constant.
20. Describe the three key observations from the photoelectric effect experiment and how they are different to the wave model of light.