Welcome!

Bishop Heber High School

AS Physics — Mr A.C. Norman

September 14, 2011

Expectations

An hour of out-of-class time on academic work for each lesson of material covered in class.
Physics is best learned (and revised) by doing problems, making your own notes about the material, reading around the topics, and thinking about the physics carefully.
You will need a ring binder!
Print off the notes the night before from the course E:HEBER site, fill them in during the lesson, making any additional annotations in the margins, and write up your own version in neat in your files.
Be prepared to think, take part and answer questions in lesson time.
Take charge of your own learning.

Office Hours are week 2 Tuesdays 3.45–5.0 p.m. in room 19.

Registration form

I have told you what I want from you, now I want to get to know a bit about you, and what you want from AS Physics.

Lesson Objectives

1. To revise atomic structure from GCSE.
2. To learn how to use nuclide notation and the definition of an isotope.
3. To practise short atomic structure questions.

Textbook pp. 4–5

Specification Requirement

Constituents of the atom

Proton, neutron, electron Their charge and mass in SI units and relative units. Specific charge of nuclei and ions. Atomic mass unit is not required.

Proton number Z, nucleon number A, nuclide notation, isotopes

[AQA GCE AS and A Level Specification Physics A, 2009/10 onwards]

Inside the atom

The table below summarizes the particles which make up matter

Name	Location	Charge / C	Relative mass	Actual mass / kg
Proton	nucleus	$+1.6 \times 10^{-19}$	1	1.67×10^{-27}
Neutron	nucleus	0	1	1.67×10^{-27}
Electron	orbitals	-1.6×10^{-19}	1/1833	9.11×10^{-31}

Nuclide notation

An atom is written as

$${}^{A}_{Z}\mathrm{X}$$

where

A is the nucleon number (the number of protons and neutrons),

Z is the proton number, and

X is the element symbol.

Isotopes

Isotopes are nuclides with the same proton number, but different nucleon numbers (i.e. same number of protons, but different numbers of neutrons).
Many elements exist in several stable isotopes, and they are not given separate names, except for:

- ${}^{1}_{1}\mathrm{H}$ is hydrogen.
- ${}^{2}_{1}\mathrm{H}$ is deuterium.
- ${}^{3}_{1}\mathrm{H}$ is tritium.