

GCSE Physics: what you need to know

Nuclear Physics

The structure of an atom	I can do this already	Covered in class	Strength	Weakness	I have revised this	Book references
I can describe the basic structure of an atom.						O: 50 H: 88
I can state the size of an atom by quoting a typical radius in standard form.						O: 94 H: 88
I can compare the atom of an atom with the size of a nucleus.						O: 94 H: 92
I can define the atomic number of an atom.						O: 96 H: 89
I can define the mass number (aka nucleon number) of an atom.						O: 96 H: 89
I can explain why an atom has no overall charge.						O: 50 H: 89
I can represent atoms in the format: ${}^{(mass\ number)}_{(atomic\ number)}Na$.						O: 96 H: 89
I can describe what isotopes of an element are.						O: 96 H: 90
I can explain how an atom can become either a positive or a negative ion.						O: 50 H: 89
I can describe the historical 'Plum Pudding' model of the atom, and compare it to our current model.						O: 94 H: 91
I can describe the alpha particle scattering (Rutherford) experiment.						O: 94 H: 91
I can explain why the results of the alpha particle scattering experiment led to scientists rejecting the 'Plum Pudding' model of the atom.						O: 94 H: 92
I can list 3 ways in which Rutherford's model of the atom was modified resulting in today's model.						O: 95 H: 92

Nuclear radiation						
I can describe what it means for an atom to be radioactive.						O: 93 H: 93
I can describe the randomness of radioactive decay.						O: 93 H: 93, 98
I can define the Activity of a radioactive material, and state its unit.						O: 100 H: 99
I can define Count rate.						O: 100 H: 99
I can describe the structure and origin of alpha, beta, and gamma radiation.						O: 96 H: 94
I can write Nuclear equations to represent alpha, beta and gamma decay.						O: 96 H: 94
I can describe the ionising powers of alpha, beta, and gamma radiation.						O: 98 H: 97
I can state the penetrating powers of alpha, beta, and gamma radiation.						O: 98 H: 97
I can state the range in air of alpha, beta, and gamma radiation.						O: 98 H: 97
I can define the Half-life of a radioactive material.						O: 100 H: 99
I can calculate the half-life of radioactive sources based on a graph of activity vs. time, or from written information.						O: 100 H: 100
I can calculate the fraction of radioactive atoms remaining after multiple half-lives have elapsed.						O: 101 H: 100

Hazards and uses of radioactive emissions	I can do this already	Covered in class	Strength	Weakness	I have revised this	Book references
I can define contamination.						O: 98 H: 105
I can define irradiation.						O: 98 H: 105
I can define ionisation.						O: 98 H: 95
I can compare the hazards associated with contamination and irradiation.						O: 98 H: 102
I can describe suitable precautions to take when using radioactive materials.						O: 103 H:
I can list the sources of background radiation and categorise each as natural or artificial.						O: 103, 108 H: 97
I describe uses of radiation, including in Medicine.						O: 102 H: 104
I can evaluate the appropriateness of different sources of radiation for different uses based on the properties of that radiation.						O: H:

Nuclear fission and fusion	I can do this already	Covered in class	Strength	Weakness	I have revised this	Book references
I can define Nuclear fission.						O: 104 H: 106
I can explain the process of Nuclear fission, listing the products of a fission reaction.						O: 104 H: 106, 107
I can explain the process of a Nuclear chain reaction.						O: 104 H: 107
I can explain how a fission reactor is designed to control a fission reaction.						O: 104 H: 107
I can define Nuclear fusion.						O: 106 H: 108
I can state the conditions required for nuclear fusion.						O: 106 H: 108
I know that during nuclear fusion some mass is converted into energy.						O: 106 H: 108

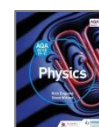
Book references:

O = *Physics* by Breithaupt
(published by Oxford)



You can get this textbook by logging into Kerboodle.

H = *Physics* by England and Whitney
(published by Hodder)



You can get this textbook by logging into Dynamic learning.