

Physics &gt; Big idea PMA: Matter &gt; Topic PMA5: Nuclear physics

## Key concept (age 14-16)

### PMA5.1: Atomic nuclei

#### Progression toolkit: Atomic nuclei

Learning focus	There is a fixed number of positively charged protons in the nucleus of each atom of an element, but the number of neutrons can vary to make isotopes that are either stable or unstable.				
As students' conceptual understanding progresses they can:	<div>CONCEPTUAL PROGRESSION</div>				
	Describe the structure and scale of an atom. <div>P</div>	Describe the properties of protons and neutrons in a nucleus.	Determine the structure of an atom from its mass number and atomic number.	Explain what isotopes of an element are.	Explain why some nuclei are stable and others are not. <div>B</div>
Diagnostic questions	Building blocks	Protons and neutrons	Numbering nucleons	Different, but the same	A stable relationship
					A stable partnership
Response activities	Striking gold	Holding it together	Accounting for atoms		Pushing apart

Key:

**P** Prior understanding from earlier stages of learning

**B** Bridge to later stages of learning

Developed by the University of York Science Education Group, the Salters' Institute and the Institute of Physics.  
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