

Physics		Lesson 16: Has the universe always been there?		
Curriculum Key:	AQA Core 13.7	OCRA P2	OCRB P2h	Edexcel Topic 12
Objective(s) 1. Understand how and why scientists come up with theories. 2. Know the main theories of the evolution of the universe. 3. Know the observations and evidence to support these theories.		Resources needed: PowerPoint presentation Cards stating the main theories Cards stating the main evidence for the theories.		
Starter: 5 – 10 minutes How big is the universe? How did it get here? Students can discuss their ideas about how big the universe is and how it started. (Presentation slide 'Task A'). For less able groups; teacher led discussion about relative sizes of our planet, the solar system, the galaxy, etc. Get students to realise the size of the universe. (Presentation slide 'Task A').		Teacher input/assessment Guide students through 'light-year' calculation. Use example in teaching notes to get across the idea of sizes.		
Main Activity 1: 15 - 20 minutes Teacher uses presentation slides to describe the main theories addressing the evolution of the universe. Most able could sort these theories into two groups: Those with a beginning and those without a beginning. Those that changed and those that didn't.		Teacher input / assessment Explain that other groupings are possible and may not be equal sizes.		
Main Activity 2: 20 - 25 minutes Teacher to discuss main sources of evidence for the evolution of the universe. Students to match up the evidence to the theory that it supports. Card sort, slide on presentation.		Teacher input / assessment If necessary, draw out the significance of the various pieces of evidence.		
Plenary: 5 - 10 minutes Students discuss the need for repeated observations. Why must scientists repeat their experiments? Most able students to decide which theory is the most likely and form an argument to support their decision.		Teacher input / assessment .		
Learning Outcomes: All students must: Be able to recall the main ideas for the evolution of the universe. Most students should: Be able to match the key ideas of the evolution of the universe to the main sources of evidence. Some students could: Discuss the main ideas for the evolution of the universe and use the evidence to form an argument for one or more of the theories.				
Key Skills: Matching theory to evidence Key words: Universe, expansion, Big Bang Homework: Design a front page for a newspaper telling people how it all started.		Differentiation: More able: Decide which theory is the most likely and form an argument to support their decision. Less able: Appreciate that Big Bang is the current theory recognised as being correct.		