

Contemporary Science Issues

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| Physics | | Lesson 17: Waves of war (follows study of the electromagnetic spectrum) | |
| Curriculum Key: | | AQA Core 13.5 | OCRA P2 (and Additional Science specifications) |
| Objective(s) 1. Understand how the wavelength of radio/microwaves affects their characteristics and uses. 2. Know how real scientists make decisions and about the impact of these decisions. 3. Understand how radar has developed from a basic system to have more specialised uses. | | Resources needed: Two sets of Wave War worksheets (each set for half the class) Blindfold. Coin. | |
| Starter: 10 minutes How big is a radio wave? Remind the class of the wavelength of typical radio waves. (i.e. Radio 4 Long wave is 1500m long) Microwaves can go easily into the centimetre range. Take the Princess and the pea challenge! (see Teacher notes). | | Teacher input/assessment Lead through questioning. | |
| Main Activity 1: 5 minutes Watch the PowerPoint presentation about radar. This shows the early use of the science breakthrough in the second world war and up to date use in speed cameras. | | Teacher input / assessment Discuss. | |
| Main Activity 2: 25 minutes Split class into two groups (ideally move one group into a separate area). Each group needs to pick a chairperson and a scribe to record decisions. Very large classes might need to be split into 4 teams with two pairs competing against each other. Use the two sets of worksheets to structure the discussions. Feel free to offer spy information to each group as you move between groups! You can even tell them the truth if you like! | | Teacher input / assessment Observer and spy Look to see how each group functions. Assess students understanding based on their responses. | |
| Plenary: 20 minutes Evaluation of student teams' responses. Use the evaluation sheets to calculate a score for each team and indicate what effect that has on the war. Allow students to discuss the impact of radar technology on warfare. | | Teacher input / assessment Explain that the scenario is based on the real situation between Britain and Nazi Germany in the early days of the second world war. Ask students how they arrived at their decisions. | |
| Learning Outcomes: All students must: Participate in the group discussion. Most students should: Be able to explain why smaller wavelength waves show more detail in a radar system. Some students could: Suggest new developments for radar research that the 1930-40's scientists could have pursued. | | | |
| Key Skills: Team work Key words: Radar, Radio wave, Microwave, Wavelength Homework: Research and report on "Stealth technology" as used in the US Stealth bomber and similar projects. Explain how to make a radar-proof aircraft (include pictures or diagrams). Internet highly recommended. | | Differentiation: More able: Express a viewpoint confidently and back it up with scientific fact. Less able: Respond to teacher prompts in order to arrive at a solution. | |