

Overview

This unit provides a rationale for teaching about ethical issues in GCSE Science (age 14–16). The aim is to introduce the idea that the discussion of controversial issues relating to the conduct and application of science involves making decisions about what it is possible to do and about what should be done. In any situation, there is usually more than one option to choose from. Often, a course of action may seem like a good solution, but it may also have some undesirable outcomes.

A scientific problem may be approached by generating scientific theories, which may then be tested by experiment. Ethical problems cannot be approached in the same way, since there are no 'theories of morality' that correspond to theories in the sciences. However, this does not mean that all possible answers to ethical problems have the same merit or that ethical problems cannot be the subject of rigorous analysis.

The activities

There are two activities in this unit. Either activity could be used as a standalone activity. The activities do not require any prior knowledge. The first part of the activity 'Can it be done? Should it be done?' could be set as a homework.

Difficult decisions

A PowerPoint presentation about young people and athletics provides the basis for distinguishing scientific questions from ethical questions. It also offers a structured approach to group discussion. The discussion features the rights and wrongs of the use and abuse of drugs to enhance sporting performance. The analysis is carried out using the framework of goals, rights and duties.

Can it be done? Should it be done?

This activity aims to encourage students to think about suggested scientific or technological developments and decide whether such developments are a good or bad idea and if they should consider / require further information before making any decisions. If students have not done the first activity, you would need to explain the meaning of the terms goals, rights and duties.

Curriculum links (for students aged 14–16)

How Science Works (from POS KS4 for England)

Data, evidence, theories and explanations

1d that there are some questions that science cannot currently answer, and some that science cannot address

Communication skills

3a recall, analyse, interpret, apply and question scientific information or ideas

3c present information, develop an argument and draw a conclusion, using scientific, technical and mathematical language, conventions and symbols and ICT tools

Applications and implications of science

4a about the use of contemporary scientific and technological developments and their benefits, drawbacks and risks

4b to consider how and why decisions about science and technology are made including those which raise ethical issues, and about social, economic and environmental effects of such decisions

GCSE or equivalent 14–16 specifications

England (GCSE)

AQA Science A 4461

Biology 1a: Human Biology 11.3 How do we use/abuse medical and recreational drugs?

AQA Science B 4462

Biology Unit 1: 11.3 How do we use/abuse medical and recreational drugs?

AQA Biology 4411

Unit Biology 1: 11.3 How do we use/abuse medical and recreational drugs?

AQA Applied Science (Double Award) 4861

Science for the Needs of Society Unit 2: 11.2 Health and Medicine – The Body at Risk

Edexcel 360 Science 2101

Biology B1 a: Topic 1 – Environment; Topic 4 – Use, Misuse and Abuse

Edexcel 360 Additional Science 2103

Biology B2: Topic 2 – Divide and Develop

OCR Science A (21C science) J630

Module B2: Keeping Healthy

OCR Biology A (21C) J633

Module B2: Keeping Healthy

OCR Science B (Gateway Science) J640

Module B1: Understanding ourselves; Item B1c: Keeping Healthy; Item B1e: Drugs and You

OCR Biology B (Gateway Science) J643

Module B1: Understanding ourselves; Item B1c: Keeping Healthy; Item B1e: Drugs and You

Scotland (SCE standard grade)

no direct links

Wales (WJEC GCSE)

Science

Biology B1: 8. Health

Applied Science (Double Award)

Science & Society Unit 2: (a) The Human Body and Health;

NI (CCEA GCSE)

Science (Single Award)

Module 2 Human Activity and Health: Disease and Body Defences;

Learning objectives

This unit introduces students to the idea that discussion of controversial issues related to science involves making decisions about what is possible, what should be done and the consequences of different choices.

By working through the unit, students come to understand that:

- decisions about controversial issues involving science require scientific information to decide what is possible
- science alone does not provide a method for making decisions about controversial issues
- the discipline of ethics provides ways of making decisions about controversial issues involving notions of right and wrong
- in any given situation, there is usually more than one choice available.
- a course of action may seem like a good solution, but it may also have some undesirable consequences.

Teaching and learning approaches

- Discussing ideas in a small group ✓ (LSS2)
- Argumentation ✓

For further information about Learning Skills for Science (LSS) [click here](#).

Downloads

Difficult decisions

- PowerPoint presentation
 - slides 1–12 (some alternatives)

Can it be done? Should it be done?

- PowerPoint presentation
 - slide 14– Can we? Should we?
 - slide 9 – goals, rights and duties
 - slide 15 – blank table
- Activity sheet – Can we? Should we?
- Activity sheet – Should we? (extension)

Acknowledgements

This unit was written by Andrew Hunt and edited by Silvia Newton. It is based on the original SATIS unit 1010, but it also draws on 'Difficult decisions' in *New SATIS 14–16* published in *The World of Science* in 1997. The unit has been influenced by ideas related to ethics in science education in Patrick Fullick, Mary Ratcliffe (eds.), *Teaching Ethical Aspects of Science*, Bassett Press (1996) and those on the BEEP, PEEP, DEMOCS and Nuffield Foundation SCPU websites.

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