

# CPD 4 Ethical debate

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## Module introduction

This module consists of an introduction plus five sections: two possible preparatory tasks and three activities that can be carried out in small groups. The module is intended for use with teachers to develop ideas about ethical debates in biology lessons. The introduction and activities could be delivered in about 1 hour.

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## The structure of this module

### Preparatory tasks

- ‘Frequently asked questions’ for participating teachers to read in advance of the group session
- Optional background reading for the facilitator (and possibly the participating teachers): ‘How we reach ethical conclusions’ by Michael Reiss

### Introduction

This module has an interactive introductory presentation with commentary – ‘Why introduce ethical debates into biology lessons?’ This could be looked at by teachers individually before the session, or in a group at the start of the staff development session.

A more detailed introduction to the CPD is provided in these Facilitator notes to give you further background.

### Activity 1 Ethical issues related to genetic screening: identifying the issues

Facilitator notes and Activity sheet are provided. See pp. 3–4 of the Facilitator notes for more details.

Estimated delivery time: 20 minutes

### Activity 2 Using ethical frameworks

Facilitator notes and Activity sheet are provided. See pp. 4–5 of the Facilitator notes for more details.

The SNAB AS Student book is also needed to refer to the ethical frameworks described in the section ‘What is right and what is wrong?’ on pp. 93–95.

Estimated delivery time: 20–30 minutes

### Activity 3 Applying your knowledge of ethical frameworks

Facilitator notes and Activity sheet are provided. See p. 5 of the Facilitator notes for more details.

Each participant needs a copy of the article in Student Activity 2.21 Genetic screening. The SNAB AS Student book is also needed to refer to the ethical frameworks described in the section ‘What is right and what is wrong?’ on pp. 93–95.

Estimated delivery time: 5–10 minutes

## Introducing the activities

### Why engage in classroom discussion of ethical arguments?

Biology classes should attempt to reflect the activities of professional scientists.

Scientists working in the biological sciences increasingly have to articulate a perspective on the social and ethical issues arising from their work. The new biotechnologies, animal testing, zoos and use of drugs in sport are just some examples of areas surrounded by ethical debate. Science taught in schools and colleges does not represent the full range of skills and intellectual engagement of working scientists if these areas of a scientist's work are ignored. The high profile of many of these issues in the media and their relevance to society makes it more likely that students will be motivated to take part in bioethical discussion.

One of the features of professional science is that it is a social activity involving discussion by members within a research team and between teams within the global scientific community. An attempt to mirror this engaging and challenging aspect of modern science in the classroom may allow students to appreciate more fully the breadth and importance of science, and its roles and responsibilities in society.

### Developing transferable skills in biology lessons

The new biotechnologies raise ethical dilemmas that are frequently discussed in the media. Misinformation and misconceptions are common in some of the popular arguments, and often scientists themselves disagree on the ethical questions around biotechnological issues. Providing students with tools to engage in ethical argument can give them transferable skills needed for critical evaluation of new information and for informed decision-making. These are important life skills in addition to their value in academic pursuits. Written work using both ethical argument and science concepts is supported by development of these oral discussions and critical thinking skills. This module provides a simple framework to support ethical discussion.

Teaching about ethical frameworks and how to construct a valid ethical argument is an alternative approach to coaching students to produce a discrete set of ethical arguments around a particular topic in an examination course. The approach being presented in this module should

increase students' confidence to engage with a wide range of issues. It can also encourage student autonomy by giving students responsibility for researching the knowledge base of arguments on both sides of a bioethical discussion.

### Broadening teaching and learning approaches – class and group discussion

The teaching approaches used in conducting this type of discussion are more familiar in humanities than in a science classroom. The process of conducting discussion may be challenging for the science teacher. Properly managed, it can provide interesting and motivating relief from the content-focus of a curriculum.

Ethical discussion involves engagement of emotions and value systems, in addition to application of knowledge. Relationships and communication between members of a discussion group are central to the success of the activity. Coping with the controversies arising from different points of view involves consideration for others and tolerance, as well as evaluation of the grounds for different stances. This module touches on some ways that group relationships can be analysed and developed.

Studies of students' attitudes to science lessons suggest that part of their all too frequent dissatisfaction with school science is due to the nature of the teaching approaches used. Science is often presented as having 'right' and 'wrong' answers, with little scope for students to express their own opinions. This contrasts with humanities lessons where students' opinions are often heard and valued. Ethical discussion provides an opportunity for students to engage with science in a more personal and active way than is usual in more traditional science lessons.

### Assessment for learning

Lessons with ethical discussions need to have clear outcomes just as in any other lessons. However, the outcomes may be less easily defined or assessed than in a formal teacher-led science lesson. There may be limited or even no consensus of opinion after a lesson discussing bioethics, but the value of the lesson lies in the development of skills and biological knowledge needed to engage with the issues. This module provides an example of how an activity can formalise the assessment of learning outcomes when teaching about ethics in biology.

If discussion provides a good approach for engagement with a biological topic, then it is also important to be able to assess the biological knowledge gained. Recognition of the value of

this type of teaching and learning process helps justify the time needed for proper discussion and the development of skills within the tight schedule of an examined course.

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## Delivering the activities

### Activity 1 Ethical issues related to genetic screening: identifying the issues

Introduction to an ethical debate on a particular topic may start with identifying the ethical issues around the topic.

#### *Suggested delivery method*

The task can take place in pairs or small groups. The ideas from each group could then be shared for discussion. Guidance notes on outcomes for the task are provided below.

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| Estimated delivery time: 20 minutes |
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#### **Task**

#### ***What are the issues related to genetic screening?***

**1 Pre-conception screening of parents** Couples considering becoming parents can be screened to identify a potential reproductive genetic risk. For example, this type of screening can identify carriers of genetic diseases such as cystic fibrosis.

Some suggested related ethical issues:

- Are the parents counselled adequately so they understand the interpretation of a positive or negative result? In other words, is their consent to the screening fully informed? Results of testing are rarely 100% accurate, so false negatives should be considered. (A false negative is when the person who had the test is told that the result is negative, when the result should have been positive.) A positive result should be considered alongside present and potential future treatments for any disorder.
- A positive result for the presence of a faulty gene raises issues around possible duties to inform other related family members.
- Pre-conception screening may reduce the number of abortions carried out after pre-natal screening. (This also applies to pre-implantation screening.)

**2 Pre-implantation screening** In an IVF-like procedure, around 6–10 embryos are created and tested. Embryos containing a gene for the disorder being screened for are discarded. Only two (or sometimes three) healthy embryos are implanted.

Some suggested related ethical issues:

- Unwanted healthy embryos will be discarded along with embryos containing the faulty gene.
- Attitudes to disabilities are raised by the technology enabling us to select for healthy embryos.
- Should we use all the technology we have at our disposal to try to ensure only the healthiest babies are born?

**3 Pre-natal screening** Cells of the fetus are screened for a particular genetic disorder. Chorionic villus sampling can be carried out between 8 and 12 weeks of pregnancy, and amniocentesis can be carried out at around 15–17 weeks.

Some suggested related ethical issues:

- These procedures present a risk of miscarriage to possibly healthy fetuses.
- Are parents given free and properly informed choice about whether or not to abort a fetus found to have a gene disorder?

- Should the social, financial, happiness and health considerations of the parents be given more weight than the baby's right to life?

**4 Screening of adults** Adult screening can detect existing or late-onset diseases such as Huntington's or Alzheimer's. Screening can test for susceptibility to certain cancers with a genetic basis, and polygenic diseases. It can identify carriers of recessive disorders.

Some suggested related ethical issues:

- Should a person identified with a gene for a late-onset disease be obliged to inform close family members who may also carry the gene, or should this information be private?
- Should children of a person identified with a gene for a late-onset disease be screened before they are old enough to give informed consent?
- Is the screening voluntary, for example, does it take place as part of an unrelated medical procedure?

### Activity 2 Using ethical frameworks

This activity refers to a statement about pre-natal screening.

#### **Suggested delivery method**

Pairs or individuals sort a range of ethical arguments about ethical screening given out on slips of paper. They use 'What is right and what is wrong?' in the SNAB AS Student book, pp. 93–95, to decide which of the four ethical frameworks described best supports each argument. They then try to produce additional ethical arguments for each of the ethical frameworks.

Leave time for whole-group feedback and comments at the end. The ethical statements are provided as a table to photocopy and cut up in the Appendix at the end of these Facilitator notes. Guidance notes on outcomes for the task are provided below.

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| Estimated delivery time: 20–30 minutes |
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#### **Task**

Here are some suggested answers to the sorting task. One additional argument is shown in *italics* for each framework.

#### **Rights and duties**

- Every individual, born or unborn, has the right to life.
- Rights of a fetus may conflict with rights of the mother if a pregnancy presents risks to the mother's physical or mental health.
- *Parents, medical professionals and society have a duty of care towards an individual before and after birth.*

#### **Maximising the amount of good in the world**

- It is unethical to bring a child with a genetic disease into the world if it will result in suffering of the individual, reduce the happiness of parents and family, or drain the financial resources of society.
- In a society where the number of children born to most parents is limited by the use of contraception, allowing a child with a genetic disease to be born in effect replaces a healthy child with an unhealthy one. Selecting healthy children will strengthen, rather than weaken, the gene pool, reducing the number of faulty genes in the population.
- *People with severe physical or mental disabilities are often able and active citizens, contributing greatly to society. Judging an individual's 'fitness to live' on the basis of genetic disorders may deny society the benefits of these people's contributions.*

***Making decisions for yourself***

- Parents may have to make a special commitment of care to a child with a disability. It is up to the parents to decide if they are willing and able to do this.
- Medical professionals need to take time and care to explain the full implications of a positive result in pre-natal genetic screening. Unless parents understand the range of potential scenarios, positive and negative, they are not in the position to take the necessary decisions.
- *Nurses and doctors who do not wish to participate in abortions should have their wishes respected.*

***Leading a virtuous life***

- A 'good' society is prepared to love and care for individuals irrespective of their physical or mental capacities.
- Allowing pre-natal genetic screening to take place is only acceptable in a limited range of cases. These include cases where early detection of a disorder will improve the effectiveness of post-natal treatment and care.
- *Abortion could be seen as virtuous in cases where the genetic disorder produces a great deal of suffering and misery for the individual with the disorder.*

**Activity 3 Applying your knowledge of ethical frameworks**

Have the activities succeeded in teaching about ethical frameworks? An activity such as this one can be used to discover what has been learned.

If further time is available, use the article in Student Activity 2.21 Genetic screening to test the skills in identifying particular ethical frameworks.

***Suggested delivery method***

Ask the participants to use a colour code to identify arguments within each of the four ethical frameworks described in 'What is right and what is wrong?', in the SNAB AS Student book, pp. 93–95.

As an additional task, ask the participants to highlight statements in the article which they consider to have a basis in one of the four frameworks listed below:

- Rights and duties
- Maximising the amount of good in the world
- Making decisions for yourself
- Leading a virtuous life.

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| Estimated delivery time: 5–10 minutes |
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**Appendix: Activity 2 Using ethical frameworks**



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| <p>Every individual, born or unborn, has the right to life.</p>  | <p>In a society where the number of children born to most parents is limited by the use of contraception, allowing a child with a genetic disease to be born in effect replaces a healthy child with an unhealthy one. Selecting healthy children will strengthen, rather than weaken, the gene pool, reducing the number of faulty genes in the population.</p> |
| <p>Parents may have to make a special commitment of care to a child with a disability. It is up to the parents to decide if they are willing and able to do this.</p>  | <p>A 'good' society is prepared to love and care for individuals irrespective of their physical or mental capacities.</p>  |
| <p>It is unethical to bring a child with a genetic disease into the world if it will result in suffering of the individual, reduce the happiness of parents and family, or drain the financial resources of society.</p>           | <p>Rights of a fetus may conflict with rights of the mother if a pregnancy presents risks to the mother's physical or mental health.</p>   |
| <p>Allowing pre-natal genetic screening to take place is only acceptable in a limited range of cases. These include cases where early detection of a disorder will improve the effectiveness of post-natal treatment and care.</p> | <p>Medical professionals need to take time and care to explain the full implications of a positive result in pre-natal genetic screening. Unless parents understand the range of potential scenarios, positive and negative, they are not in the position to take the necessary decisions.</p>   |