



Debating the Issues

In this activity, students debate issues around science. These can be ethical issues raised by science, or misconceptions about science itself.

Key Stage

Key Stage (KS) 2 – 5, depending on the topic of the debate.

Rationale

Debating becomes a formal requirement at KS 4 but it is useful to introduce students to it earlier so that by the time they meet it at KS 4 they are able to concentrate more on the topic at hand than on the method of debating. Debates serve many purposes: They encourage pupils to frame their arguments in a persuasive way, backed up by evidence; they raise issues that pupils may not have considered previously; they raise awareness that not all issues have black-and-white answers; they encourage critical thinking, providing a cross-curricular link with English and Citizenship.

National Curriculum Links

The National Curriculum links for each key stage – covering Citizenship, English and Science – are summarised at the end of this activity.

Activity

Please note this activity is designed to run over more than one lesson. In the outline below, two lessons are taken up, with a visit to Centre of the Cell in between them. However, the format will vary depending on the class and the type of debate being run.

Formats for debates

There are many possible formats for debates, from one-on-one discussion, to full-class participation, for example where each child represents their views on a continuum by standing on a line. If you would like advice on topics or formats for debates, please contact us on info@centreofthecell.org.

Possible debate topics

If your students are new to debating, beginning with an easier topic will help them learn the rules and format of debating. Then, when they move onto more complex topics they are already grounded in the method and can concentrate more on the message. Introducing the concept debating with a complicated topic like embryonic stem cells will leave pupils less time to consider their arguments because they are still learning the ropes.

Some suggestions for debate topics follow. These are just ideas that may be helpful. You may find, however, that there are other topics that fit better with the units your students are currently covering.

Debates on science in general

Science lessons should be compulsory in schools

Scientific research should not be funded by the taxpayer

A science degree will not give you any career prospects

Science is irrelevant to me / Knowledge of science is irrelevant to me

Scientists will solve all of the world's problems – like climate change – so I do not need to worry about these issues.

Further notes:

Law is not a compulsory course of study at school, but plenty of people study law at university and enter the legal profession.

Do non-scientists need to know scientific facts? If someone is a plumber or an athlete, what use is knowledge of, eg, the link between resistance and current?

Why does science need public funding? If science was that useful, would it not be fundable via the usual laws of the free market (ie, supply and demand)?

Is public funding useful because it allows government regulation of research?

Debates on the ethics of science

Embryonic stem cells should not be used for research into treatments for disease.

Testing medicines on animals prior to clinical trials in humans is right and necessary.

Screening of embryos for genetic characteristics prior to implantation is wrong.

IVF is morally wrong because it produces non-implanted embryos.

Further notes:

What about adult stem cells? Are there still issues with this research (ie, intellectual property) despite the fact that no embryos are destroyed?

If testing medicines on animals is morally right, what constitutes a medicine?

Is it right to test cosmetics on animals? What is cosmetic? What if a patient receives psychological benefit from a cosmetic procedure?

If it is right to screen embryos for diseases such as cystic fibrosis, what about deafness? Should parents be able to choose a deaf or non-deaf child? What about more superficial characteristics?

Lesson one (before the Visit)

Introduce the visit to Centre of the Cell (see “About Centre of the Cell, www.centreofthecell.org/activites).

Tell the students that the point of Centre of the Cell is to get them thinking about bigger issues in science. On that basis, they are going to be having a debate.

Give them the topic, split them into groups (depending on the format of the debate you are running), and ask them to chose a position – ie, for or against.

Once they have their position, they can start to research. You may wish to take a lesson to introduce research methods if the students are new to debating. If this is the case, then the lesson after the visit (see below) would be Lesson Three.

- For younger children, this might involve simply having conversations, finding instances/anecdotes.
- Older children should define the question they will answer (if it is not already defined for them), and then research arguments to defend their point of view. This research can be internet- or textbook-based, providing they can defend their sources as credible. Older children can also be set research as homework.

With about ten minutes to go, ask students to summarise their position and their supporting evidence (so far) in writing. You may like to also ask them to write down what further research they are planning to do.

Close lesson with the logistics of Centre of the Cell visit – timing, travel, food etc. This information can be found in our “About the Visit” document, mentioned above.

Lesson two (after the Visit)

For younger pupils:

Ask them to review the summary position they wrote down at the end of the previous lesson. Has it changed since visiting the Pod? How has it changed?

Ask them to write down their new summary position.

These positions can then be defended in debate, either by asking each pupil individually to verbally defend their position, or by eg, asking all pupils to stand on a line at a point that represents their stance, where one end of the line is “definitely for/agree”, and the other is “definitely against/disagree”. Points along the line would therefore represent different levels of agreement or disagreement.

For older pupils:

If their summary position has changed since visiting the Pod, the new position will require research to find evidence to support it. This can be completed as homework.

On the day of the debate, depending on your chosen format, pupils will defend their positions to each other.

NB: in the event that all pupils agree, it may be necessary to ask some to play devil’s advocate and support a position with which they disagree.

National Curriculum Links

Please note that links may vary depending on the topic and format of the debate, and the ability of the class.

Key Stage 2

Citizenship recommendations

Ties into three of the four sections of the Citizenship recommendations: *Developing confidence and responsibility and making the most of their abilities*; *Preparing to play an active role as citizens*; and *Developing good relationships and respecting the differences between people*. There may also be links to the section on *Developing a healthy, safer lifestyle*, depending on the debate topic.

English

Ties into *En1 Speaking & Listening* sections on *Speaking*, *Listening* and *Group discussion and interaction*. Depending on the level of the group, there may also be ties with sections on *Drama*, *Standard English*, and *Language variation*, if pupils are encouraged to consider how their body language, presentation and phrasing influence the debate.

Science

Many of the games link into the KS2 science curriculum. A list of these links can be found on www.centreofthecell.org/lessonplans. A debate based on one or more of these games (*ie, nerve cells are more important than cartilage cells, based on Build An Organ*) will also cover the sections of the science curriculum that are covered by the game.

Key Stage 3

Citizenship

1.1 – *Democracy and justice*

1.1b) Weighing up what is fair and unfair in different situations, understanding that justice is fundamental to a democratic society and exploring the role of law in maintaining order and resolving conflict.

1.2 – *Rights and responsibilities*

1.2a) Exploring different kinds of rights and obligations and how these affect both individuals and communities.

1.2b) Understanding that individuals, organisations and governments have responsibilities to ensure that rights are balanced, supported and protected.

1.2c) Investigating ways in which rights can compete and conflict, and understanding that hard decisions have to be made to try to balance these.

2.1 – *Critical thinking and enquiry*

2.1a) engage with and reflect on different ideas, opinions, beliefs and values when exploring topical and controversial issues and problems

2.1b) research, plan and undertake enquiries into issues and problems using a range of information and sources

2.1c) analyse and evaluate sources used, questioning different values, ideas and viewpoints and recognising bias.

2.2 – *Advocacy and representation*

2.2a) express and explain their own opinions to others through discussions, formal debates and voting

2.2b) communicate an argument, taking account of different viewpoints and drawing on what they have learnt through research, action and debate

2.2c) justify their argument, giving reasons to try to persuade others to think again, change or support them

2.2d) represent the views of others, with which they may or may not agree.

4 – *Curriculum opportunities*

The curriculum should provide opportunities for pupils to:

4a) debate, in groups and whole class discussions, topical and controversial issues, including those of concern to young people.

4j) make links between citizenship and other subjects and areas of the curriculum.

English

1.1 – *Competence*

- 1.1a) being clear, coherent and accurate in spoken and written communication
- 1.1d) making informed choices about effective ways to communicate formally and informally

NB: depending on the level of the group and the topic being discussed, there may also be links to 1.2 - *Creativity*

1.4 – *Critical understanding*

- 1.4b) assessing the significance and validity of information and ideas from different sources
- 1.4c) exploring others' ideas and developing their own
- 1.4d) analysing and evaluating spoken and written language to explore how meaning is shaped.

2.1 – *Speaking and listening*

- 2.1a) present information and points of view clearly and appropriately in different contexts, adapting talk for a range of purposes and audiences, including the more formal
- 2.1b) use a range of ways to structure and organise their speech to support their purposes and guide the listener
- 2.1c) vary vocabulary, structures and grammar to convey meaning, including speaking Standard English fluently
- 2.1d) engage an audience, using a range of techniques to explore, enrich and explain their ideas
- 2.1e) listen and respond constructively to others, taking different views into account and modifying their own views in the light of what others say
- 2.1f) understand explicit and implicit meanings
- 2.1g) make different kinds of relevant contributions in groups, responding appropriately to others, proposing ideas and asking questions

3.1 – *Speaking and listening*

The range of speaking and listening activities should include:

- 3.1a) prepared, formal presentations and debates.

The range of purposes for speaking and listening should include:

- 3.1e) describing, instructing, narrating, explaining, justifying, persuading, entertaining, hypothesising; and exploring, shaping and expressing ideas, feelings and opinions.

4 – *Speaking and listening*

The curriculum should provide opportunities for pupils to:

- 4a) experiment with a range of approaches, produce different outcomes and play with language
- 4b) engage in specific activities that develop speaking and listening skills
- 4d) evaluate and respond constructively to their own and others' performances
- 4e) make extended contributions, individually and in groups
- 4f) develop speaking and listening skills through work that makes cross-curricular links with other subjects
- 4i) speak and listen in contexts beyond the classroom.

Science

1.2 – *Applications and implications of science*

- 1.2a) exploring how the creative application of scientific ideas can bring about technological developments and consequent changes in the way people think and behave.
- 1.2b) examining the ethical and moral implications of using and applying science.

1.3 – *Cultural understanding*

- 1.3a) recognising that modern science has its roots in many different societies and cultures, and draws on a variety of valid approaches to scientific practice.

1.4 – *Collaboration*

- 1.4a) Sharing developments and common understanding across disciplines and boundaries.

2.3 – *Communication*

Pupils should be able to:

- 2.3a) use appropriate methods, including ICT, to communicate scientific information and contribute to presentations and discussions about scientific issues.

4 – *Curriculum opportunities*

The curriculum should provide the opportunity for pupils to:

- 4a) research, experiment, discuss and develop arguments
- 4j) consider how knowledge and understanding of science informs personal and collective decisions, including those on substance abuse and sexual health
- 4k) make links between science and other subjects and areas of the curriculum

Key Stage 4

Citizenship

1.2 – *Democracy and justice*

1.1b) Weighing up what is fair and unfair in different situations, understanding that justice is fundamental to a democratic society and exploring the role of law in maintaining order and resolving conflict.

1.2 – *Rights and responsibilities*

1.2a) Exploring different kinds of rights and obligations and how these affect both individuals and communities.

1.2b) Understanding that individuals, organisations and governments have responsibilities to ensure that rights are balanced, supported and protected.

1.2c) Investigating ways in which rights can compete and conflict, and understanding that hard decisions have to be made to try to balance these.

2.1 – *Critical thinking and enquiry*

2.1a) question and reflect on different ideas, opinions, assumptions, beliefs and values when exploring topical and controversial issues and problems

2.1b) research, plan and undertake enquiries into issues and problems, using a range of information, sources and methods

2.1d) evaluate different viewpoints, exploring connections and relationships between viewpoints and actions in different contexts (from local to global)

2.2 – *Advocacy and representation*

2.2a) evaluate critically different ideas and viewpoints including those with which they do not necessarily agree.

2.2b) explain their viewpoint, drawing conclusions from what they have learnt through research, discussion and actions, including formal debates and votes.

2.2c) present a convincing argument that takes account of, and represents, different viewpoints, to try to persuade others to think again, change or support them.

4 – *Curriculum opportunities*

The curriculum should provide opportunities for pupils to:

4a) debate, in groups and whole class discussions, topical and controversial issues, including those of concern to young people.

4j) make links between citizenship and other subjects and areas of the curriculum.

English

1.1 – *Competence*

- 1.1a) Expressing complex ideas and information clearly, precisely and accurately in spoken and written communication.
- 1.1b) Applying and transferring skills in a wide range of contexts, demonstrating flexibility and adaptability.
- 1.1c) Making independent judgements about how to communicate effectively and sustain formal interaction, particularly in unfamiliar contexts.

NB: depending on the level of the group and the topic being discussed, there may also be links to 1.2 - *Creativity*

1.3 – *Critical understanding*

- 1.3a) Engaging with the details of ideas and texts.
- 1.3b) Connecting ideas, themes and issues, drawing on a range of texts.
- 1.3c) Forming independent views and challenging what is heard or read on the grounds of logic, evidence or argument.
- 1.3d) Analysing and evaluating spoken and written language to explore their impact on the audience.

2.1 – *Speaking and listening*

- 2.1a) speak fluently, adapting talk to a wide range of familiar and unfamiliar contexts and purposes, including those requiring confident and fluent use of Standard English
- 2.1b) present information clearly and persuasively to others, selecting the most appropriate way to structure and organise their speech for clarity and effect
- 2.1c) select from strategies to adapt speaking and listening flexibly in different circumstances
- 2.1d) reflect and comment critically on their own and others' performances
- 2.1e) listen to complex information and respond critically, constructively and cogently in order to clarify points and challenge ideas
- 2.1f) synthesise what they hear, separating key ideas from detail and illustration
judge the intentions and standpoint of a speaker
- 2.1g) listen with sensitivity, judging when intervention is appropriate
- 2.1h) take different roles in organising, planning and sustaining discussion in a range of formal and informal contexts
- 2.1i) work purposefully in groups, negotiating and building on the contributions of others to complete tasks or reach consensus
- 2.1j) use a range of dramatic approaches to explore complex ideas, texts and issues in scripted and improvised work

3.1 – *Speaking and listening*

The range of speaking and listening activities should include:

3.1a) prepared, formal presentations and debates.

The range of purposes for speaking and listening should include:

3.1e) describing, instructing, narrating, explaining, justifying, persuading, entertaining, hypothesising; and exploring, shaping and expressing ideas, feelings and opinions.

4.1 – *Speaking and listening*

The curriculum should provide opportunities for students to:

4.1a) build their confidence in speaking and listening in unfamiliar situations and to audiences beyond the classroom

4.1d) make extended, independent contributions that develop ideas in depth

4.1e) make purposeful presentations that allow them to speak with authority on significant subjects

4.1f) develop speaking and listening skills through work that makes cross-curricular links with other subjects

4.1g) evaluate and respond constructively to their own and others' performances

4.1i) participate in debate, discussion, live talks and presentations, engaging in dialogue with experts, members of the community and unfamiliar adults

4.1j) discuss issues of local, national and global concern.

Science

1.1 – *Data, evidence, theories and explanations*

Pupils should be taught:

1.1d) that there are some questions that science currently cannot answer, and some that science cannot address

1.3 – *Communication skills*

Pupils should be taught to:

1.3a) recall, analyse, interpret, apply and question scientific information or ideas

1.4 – *Applications and implications of science*

Pupils should be taught:

1.4a) about the use of contemporary scientific and technological developments and their benefits, drawbacks and risks

1.4b) to consider how and why decisions about science and technology are made, including those that raise ethical issues, and about the social, economic and environmental effects of such decisions

1.4c) how uncertainties in scientific knowledge and scientific ideas change over time and about the role of the scientific community in validating these changes.