

# Forward Thinking, Northern Ireland

Forward Thinking uses the Philosophy for Children (sometimes called Community of Enquiry) approach to engage students in discussion about the social and ethical aspects of scientific advances. It aims to develop students' Thinking Skills and Personal Capabilities as well as their knowledge and understanding of key topics in contemporary science.

Each Forward Thinking session follows the scheme below:

Preparation	Stimulus	Private reflections	Sharing and question creation	Airing questions	Voting for a question	Enquiry	Reflections on process/content	Last words

## Preparing the class

To settle the class, inject energy or check their understanding of the ideas to be discussed.

### Just a Minute

Based on the Radio 4 panel game, the objective is for a volunteer to speak for a minute on a topic (e.g. genes, the environment, space) without repetition, hesitation or deviation. The volunteer can be challenged by other students if they repeat words, deviate from the subject or pause. The person talking at the end of the minute wins.

### Picture classification

Where a contested concept such as what it means for something to be natural is going to be important in the discussion topic (e.g. in relation to the environment or biotechnology), students can work in small groups to explore its meaning. Pictures or descriptions of different scenarios may be printed and students asked to arrange them on a continuum, or to classify each as natural, not natural or somewhere in between, justifying their choice to each other and later to the class.

### Bingo

Involving keywords from the science topic and/or thinking skills language.

### Verbal warm-ups

For example, ask students to read the sentences below and explain the differences between them:

- 1) We don't want to eat chocolate.
- 2) **We** don't want to eat chocolate.
- 3) We **don't** want to eat chocolate.
- 4) We don't **want** to eat chocolate.
- 5) We don't want **to eat** chocolate.
- 6) We don't want to eat **chocolate**.

## Stimuli

Pretty much anything can be a stimulus for philosophical discussion. Here are some ideas for stimuli that could help promote discussion about issues relating to science.

### Film clips

Motion pictures such as *Gattaca*, *Life Story*, *The Island*, *Grizzly Man*, *Darwin's Nightmare*, *Lorenzo's Oil*, *Erin Brockovich*, *Apollo 13* and *Copenhagen* contain references to scientific concepts. Appropriate clips can be found (depending on the age of the students.) Other useful factual film clips include Nova Video Vodcasts (found on iTunes or <http://www.pbs.org/wgbh/nova/rss/podcasting.html>) and National Geographic (<http://video.nationalgeographic.com/video/>).



### Presentations

PowerPoint presentations (can be made more interactive with audience response systems), demonstrations and unusual objects (e.g. meteorites, fossils, insects) can generate philosophical questions from students.

### Pictures

Concept cartoons, paintings (such as Rembrandt's *The Anatomy Lesson of Dr Nicholas Tulp* and Joseph Wright of Derby's *An Experiment on a Bird in the Air Pump*) and cartoons (lots available on [www.cartoonstock.com](http://www.cartoonstock.com) and Tim Hunkin's page, <http://www.rudimentsofwisdom.com/>) can also be used to generate interesting discussion questions.



### Music and Sounds

Radio programmes such as RTÉ's *The Quantum Leap* and BBC Radio 4's *Science in Action* and *Material World* often feature bite-sized scientific stories. Songs with substantial references to science (sometimes with inaccuracies that students can look for) include *I Think I'm a Clone Now* by Weird Al Yankovic and *The Bloodmobile* and *Why Does the Sun Shine?* by They Might Be Giants, not to mention *Carbon is a Girl's Best Friend* by Lynda Williams.

### Texts

Newspaper articles, poetry (see Gillian K Ferguson), extracts from books and plays (such as Louis Slotin's *Sonata* and Carl Djerassi's science-in-fiction publications) are rich sources of issues associated with contemporary science.



## Voting strategies

Varying the way that votes are taken can help students reflect on fairness. Here are some alternatives.

### Hands up

Students can be allowed to vote for just one question, or for as many questions as they want. Silence and closed eyes reduces coercion from friends.

### Stickers

Students are given three stickers at the start. They can use them as they want – stick all three on one question or each on a different question or any other alternative including abstention.



### Technology

Audience response technologies such as TurningPoint (see <http://www.turningtechnologies.co.uk/>) allow students to vote anonymously for the question they want.

## Managing turn-taking

Different strategies work with different groups. Here are a few examples that have worked well with groups in Northern Ireland.

### Teacher decides

Teacher decides based on hands up. Priority can be given to those who haven't spoken, e.g. students hold up a card when they want to speak (this can be the paper they have written their question on so that the teacher can see all of the questions generated) that is collected by the teacher when they speak. This allows the teacher to identify people who aren't contributing so that they can be encouraged.



### Students decide

Students pass turns between themselves using an object, e.g. a cuddly nerve cell:

Brain cell and cuddly microbes available from <http://www.giantmicrobes.com/uk/>

### Random selection

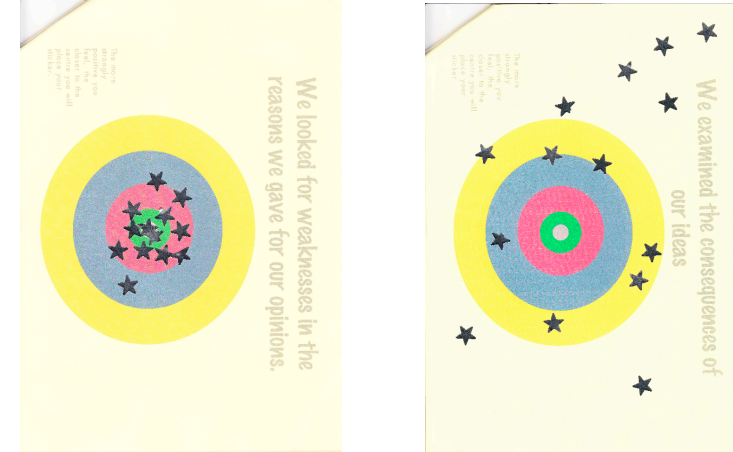
In advance, print and laminate the names of everyone in the class. Place the names face down in the centre of the circle and muddle them up. Either the students or teacher can select the next person to speak.

## Reflecting on the enquiry

Here are some examples of activities that can be used with the class to reflect on the enquiry.

### Targets

Print out targets for each objective. At the end students stick a star close to the bullseye (if they agree with statement) or far away (if they disagree), e.g.



### Blobs

For you to find out how the pupils feel during the enquiry. For information and examples see:

[http://pipwilsonbhp.blogspot.com/2004\\_11\\_01\\_pipwilsonbhp\\_archive.html](http://pipwilsonbhp.blogspot.com/2004_11_01_pipwilsonbhp_archive.html)

### Exit ticket

They can't leave the room until they give you one! e.g. →

### Comments wall

Cut out a long strip of craft paper or wallpaper. Write headings for the aspects of inquiry you want them to comment on. Give the students markers and let them go (where space is an issue they can do it on post its and quickly stick them on the comments wall).

### Floor positions

Laminate adjectives to describe the enquiry (e.g. caring, critical, creative) and place them in different areas on the floor. Students are asked to stand by the adjective that best describes the enquiry and justify their position.

## EXIT TICKET

### PHARMING

One important thing that I have learned about pharming is:

One question that I need to know the answer to in order to make my mind up about pharming is:

## Questions selected by groups in the 5-school pilot of Forward Thinking

### On pharmacogenetics...

What sort of groups are we divided into?  
Is it worth the hassle and the money when most drugs work already?  
Why are different groups of people treated differently?  
Is it a violation of human rights to choose the characteristics of an unborn child?

### On stem cell research...

Are there good reasons as well as bad reasons given for stem cell research?  
Should it even be considered as an enhancement when sick people are really in need of it?

### On cloning...

Should we clone dogs or other animals or is it an insult to their memory?  
Am I a Clone?  
Could you give a brain transplant to a clone from the original if he/she dies?  
Are there good reasons and bad reasons for cloning humans?  
What happens if your clone commits a crime and you get framed for it?

### On human enhancement...

Is it fair for the 'Blade Runner' not to run in the Olympics just because he has no legs?

### On genetic modification...

Should we mess with the genes of the banana?  
Are bananas natural?  
Should we let bananas die out?

### On the extinction of species...

Are humans alone?

### On the search for exoplanets...

If scientists find life besides Earth, what will happen to religion?  
How do we know that we are not the 'aliens'?  
Is it selfish to go to other planets, if we find them?

### On flesh eating bacteria...

If we cared less about our looks, would we live happier lives?

### On alternative diets...

If you are a vegetarian, should you eat insects?  
Will eating insects help us keep food sources that may run out?  
People eat other animals such as cow but are scared to eat insects, which are better for the environment. Why are we brought up this way?  
Should we eat animals?  
If we run out of food, could we live on insects?

### On pharming...

Is pharming cruel?

## Teacher comments about Forward Thinking

Some pupils who would never have volunteered an opinion in the past became involved in discussion. The class as a whole seems to have evolved into a 'team' - more supportive.

A number of pupils are more confident in their own thoughts, that they will be valued.

The Forward Thinking programme appears much more successful than the current LLW curriculum for promoting a range of key skills: thinking skills, cultural, social, economic, environmental awareness etc. The education boards should look to adopt this as a replacement.

It was an enlightening experience for me and I hope to use some of the strategies involved in my own teaching. To encourage discussion more than just providing the answers.

## Student comments about Forward Thinking

The best thing was working together and having arguments.

It was fun and I learned a lot.

I really enjoy thinking outside the box.

We had fun hearing others' ideas

It rocked.

Everyone was talking to each other who wouldn't normally.

You learn more because writing down isn't much learning.

I really enjoyed it I would want to do more of it

I feel more confident to disagree with opinions and say my own.

## If you are interested in taking this further...

To take part in Forward Thinking, which includes 8 sessions and training by Sapere, contact Lynda Dunlop, *Science in Society*, School of Biomedical Sciences, University of Ulster, Cromore Road, Coleraine BT52 1SA Tel. 028 703 23068 Email: [L.dunlop1@ulster.ac.uk](mailto:L.dunlop1@ulster.ac.uk) Web: [www.ulster.ac.uk/scienceinsociety/](http://www.ulster.ac.uk/scienceinsociety/)

Alternatively, contact Sapere directly. Sapere is the educational charity that acts as a co-ordinating body for Philosophy for Children in the UK, for more information on their courses and Philosophy for Children. Tel. 01865 488340 Web: <http://sapere.org.uk/>

## Sample Lesson

This lesson is suitable for students who are familiar with the Philosophy for Children/ Community of Enquiry approach and who have previously learned about genes and ecology e.g. as part of an Interdependence unit in year 10 /11.

## Objectives

Students should learn:

- to recognise flaws or weaknesses in the own and others' arguments.
- to help other students by sharing ideas and opinions.
- about how plants can be protected from disease.
- about the disadvantages of asexual reproduction.

## Preparation

Have a set of keywords related to the topic (e.g. gene, pesticide, fungus, clone, nutrient, reproduction, engineering, resistance, sterile, plantation) printed or written on large enough for the whole class to see.

Ask for a volunteer to step outside the class or cover their eyes. Show one word to the rest of the class. Hide the word and ask the volunteer to open their eyes and step inside the circle. The volunteer can ask for clues from any student with their hand up. When they guess the correct word they can sit down.

## Stimulus

The cartoon is based on the article *Banana drama* by Robin McKie, which appeared in *The Observer* newspaper on Sunday 21<sup>st</sup> May 2006.

Students read the cartoon together. Before private reflection students can clarify any factual information they didn't understand.

## Generating questions

Ask students to



### Think

of questions individually in silence.



### Pair

Share their questions with the person sitting next to them and decide on one question (this can be different to both original questions).



### Share

this question with another pair and decide on one question from the group. This is written on a sheet of A4 paper and placed in the centre of the room.

With all questions visible, ask the class to identify and explain any connections between the different questions.

## Voting

Spread the questions out well and ask students to stand next to the question they think would be most interesting to explore during the discussion.

## Enquiry

Invite the student or group who generated the question to begin the discussion. Facilitate the enquiry by asking questions to help students think better, e.g.

- Can anyone think of other reasons?
- What might other people think?
- Does anyone (dis)agree? Why?
- What are you assuming?
- What would you need to know to be sure?
- Can you think of an example?

## Reflections

Ask students to identify one thing that went well in the enquiry and one thing that they need to improve for next time. Share these verbally and use to set targets for next time.

## Evaluating

Give each student some traffic light cards (one red, one orange and one green). Formulate questions based on the lesson objectives and ask students to hold up their

- Green card ... if they understand well.
- Orange card... if they are not sure.
- Red card... if the idea needs to be explained again.



e.g.

Can you

- describe the problem facing banana farmers and consumers?
- explain some problems with producing just one variety of banana?
- identify some ways that scientists are trying to save the banana?
- explain some problems with the use of selective breeding/pesticides/genetic modification?

Or formulate questions based on the lesson objectives and ask students to hold up their

- Green card ... if they think the answer is true.
- Orange card... if they are not sure.
- Red card... if they think the statement is false.



e.g.

- The bananas we eat are clones.
- We eat wild bananas.