

## Appendix 1: Summary analysis of open text questions

Q10 – What do you think was the most important outcome from using the kits, for you as a teacher?

Responses to this open-text question were divided in to the following (teachers may have covered multiple points in their answer):

Response	% teachers
Involvement in scientific debate improved students' debating skills, ability to explore different sides of the argument and ethics knowledge	50%
Good ready-made resources made running a debate simple	24%
Encouraged students to engage through a different type of activity	19%
Increased the students' knowledge on the topic	9%

50% of teachers saw the most important outcome as allowing their students to improve their debating skills and ability to understand different sides of the argument. 24% of teachers greatly appreciated the fact that the resources were of a high standard and were easy to use and ready-made, and therefore time efficient. Only 9% of teachers saw the main benefit as increasing their students' knowledge on the debate topic.

Q11 – Do you have any comments on the design or format of the debate kits?

Responses to this open-text question were divided in to the following (teachers may have covered multiple points in their answer):

Response	% teachers
No comments	73%
The cards could have been larger	9%
The cards were too wordy, especially for SEN and low ability	5%
Design – use photos instead of cartoons	3%

Provide worksheets, summary sheets or definition cards	3%
Other	16%

The majority (73%) of the 89 teachers who responded had no comments about the design or format of the debate kits. However, 9% identified that the cards could be larger, and 5% thought the cards were too wordy, especially for SEN and low ability students. Other points were raised, including:

- Laminate the cards so they last longer
- Ensure the edges are less sharp as they could hurt younger students
- Identify different kits by using different colours
- Have more character options
- Put more pictures on the cards, for lower ability students
- Produce differentiated packs (e.g. for lower ability students)
- Use a plainer background so not to distract students

Q12 – Do you have any comments on the content of the debate kits?

Responses to this open-text question were divided in to the following (teachers may have covered multiple points in their answer):

<b>Response</b>	<b>% teachers</b>
General positive comments – e.g. very good, relevant	65%
The content could link to more topics, science news etc	9%
The cards could be more detailed	6%
The cards were too complex for Year 8 students	4%
Other	12%

The majority (65%) of the 81 teachers who responded gave positive comments, mainly that the debate kits are very good, relevant and perfect for stimulating class discussion. 9% of the teachers would like to see more topics included from topical science news. Other points were raised, including:

- Provide additional prompting notes and worksheets, summary sheets or definition cards, as above in Q11
- Use simpler language – some SEN and low ability students struggled with complexities
- Provide more advice and guidance to teachers on how to approach touchy subjects, such as lesbians and a man dying of cancer
- Focus more on the ethics of the science than the economics
- Provide more copies of each card to use in a class of 30 students
- Produce the cards in different languages

Q13 – Can you tell us what you most liked about the kits?

Responses to this open-text question were divided in to the following (teachers may have covered multiple points in their answer):

<b>Response</b>	<b>% teachers</b>
Ease of use	36%
The use of characters, and having all sides presented so not biased	23%
The design of the kits	19%
The information and ideas it guided students through	13%
The kits set science in the context of wider topical issues, and fit in HSW	9%
The kits generated interest, and students found them fun and different	8%
Diversity of characters and viewpoints	6%
Enabled debate between students	4%
All of it!	1%

Over a third of the 103 teachers who responded (36%) most liked the fact that the debate kits were so easy to use, and were ready-made for them. 23% of

teachers commented that their students were able to identify with the wide range of characters, and the diversity of the characters and viewpoints presented (6%). The design of the kits was mentioned by 19% of the teachers.

Q14 – Can you tell us what you most disliked about the kits?

Responses to this open-text question were divided in to the following (teachers may have covered multiple points in their answer):

<b>Response</b>	<b>% teachers</b>
Nothing	47%
The cards were too wordy	8%
There were not enough characters and cards for a class of 30	5%
The content and language was too complex	5%
The design	5%
The cards are too small	5%
Other	27%

Nearly 50% of the 75 teachers who responded said that there was nothing they disliked about the kits. There were no major dislikes flagged up by this survey, and more a number of small points including:

- The influence from the debate won't reach some students, or last long in their heads
- The graphics
- There could be more guidance on emotional issues (e.g. lesbians, man dying of cancer)
- The cards did not go into enough depth
- The teacher would have liked more sets
- The cards were confusing
- The kit cannot be used more than once with the same students
- There could be more 'hard science' in the kits
- The point of the debate was weak

- Being posted hard copies is preferred to downloading them
- The debate is not good for quiet students
- All the kits look too similar to each other

Q15 – Are there any other comments you'd like to make?

Responses to this open-text question were divided in to the following (teachers may have covered multiple points in their answer):

<b>Response</b>	<b>% teachers</b>
Please can you make more kits!	43%
The kits are a great idea – thank you	34%
No other comments	13%
Other	19%

77% of the 75 teachers that responded replied with positive comments – 43% asked for more kits to be made if we can secure funding, and 34% commented that the kits are a great idea. 13% of teachers did not have any additional comment to make. The remaining 19% of other comments include:

- The teacher has lent the kits to a colleague Religious Studies teacher, so there is potential for overlap
- The kits would benefit from larger text size
- The teacher has produced her own based on the idea
- Teachers would benefit from differentiated ability kits
- Produce kits tailored to topics on the Northern Irish curriculum
- Having online copies to download is useful as they can be put up on overhead projector

## **Appendix 2: All open text responses**

### 10. What do you think was the most important outcome from using the kits, for you as a teacher?

encouraging group work

THE ENTHUSIAM OF THE PUPILS FOR THE DEBATE

Abilty of students to take information and construct reasoned argument from it

Points were made easily

Idea of debates around science and morality

The students were able to see different sides of the argument.

the ethical issues around the subject which the pupils struggle to understand.

The pupils were enaged with the debate and were very passionate about the different views.

The pupils enjoyed the activity and liked using the resource due to the way it was designed.

Useful format to structure the debate

To develop independant learning skills, some students are too used of following specific instructions which is great, but the kits let them get out there are question science analytically.

new approach to teaching

Gave students a more realistic idea of why ivf is used

I was really trying it out to see if it fit in the SOW whioch it does and is useful

Allowed students to gain good debating skills. I liked the scenarios

Not having to prepare the resource.

Students gained debating skills and realised the benefit of basing their opinions / arguments on sound knowledge of facts

Getting students debating.

Little preparation time for an activity that lasted over an hour

helped bring in other subjects

seeing the other views

really got pupils thinking about the issues regarding IVF

Pupils talking about their thoughts and helping their understanding of controversial topics

the ability to debate

allowing pupils to take the lead in discussion

I shared this kit with other Biology Teachers and they all wished they had more than 1 kit. If used in FE then the pace needs to be quicker. If one had 4 groups it is difficult to duplicate the cards. Others praised it for giving them ideas to design something similar on other subjects.

Engagement of students

ready made resource with facts already there

Liked that it was ready to use and up to date. Fits in really well with the new year 8 schemes we have just written.

The discussion around being too clean - not a concept the children had really considered.

opportunity to debate - speaking and listening with good info to use

getting some of the kids to actually speak in lesson

useful prompts for kids.

Students enjoyed the discussions that arose

Debating skills, listening skills, collaborating

Consider the difference between opinions and facts and how to use them to form an argument

The class talked enthusiastically about a scientific issue

developing the student thinking skills and applying the theory they have learned to a real

situation

Was a good way to get the students thinking about other peoples view points and not necessarily relying on their first impressions of a topic.

Getting the pupils to think in different directions

HSW:- Students get a real objective look at something which is very current. Use-ability:- Very understandable content and language used in the resource which makes it useable with many different ages and abilities. everyone seems to get something out of it.

to get kids thinking more independently

It encouraged the (ASN) pupils to express an opinion, think about the facts (they found some of them hard to believe) and to talk to each other about what they thought

Getting pupils to talk in a scientific way.

Used to promote discussion on intervention in fertility. Good for getting even the quietest pupils to make a comment.

Getting the students tp discuss topical issues. The 'One Show' were doing a micro-organsim survey.

Saves time and it ready to use. Easy to follow also.

Pupils developping their own opinion and justifying it using teh evidence they had heard.

students enjoyed the activity and all got involved in the discuss. I allowed them to look at IVF from different viewpoints

Students - especially Y10 - have a much clearer idea of the process by which they form their opinion, and what might validly change it.

Convenient to use and targetted at the right level. Excellent introduction to the main concepts of microbiology

Gave the background and set the scene then for the pupils to make their own decisions on the topic

ready made, well researched format. different ideas (i am an old teacher!) to be carried out in creative ways is always refreshing

Good to promote thinking skills in students and discussion



generating debate and getting students to think about issues and formulate and express their own views

The discussion of ideas and allowing students to come up with their own backed opinions

The pupils learned how to have a discussion without it becoming an argument and were genuinely interested in the content.

Getting the pupils to consider both sides of an argument when many of them thought they had already decided on their position before the debate started.

independent learning, open ended fits CfE in Scotland

Encouraging independent thinking

gets students talking about science

Building confidence in holding debates with pupils

Given an entertaining and interesting way of delivering aspects of the curriculum. Time saving and professional looking

seeing the students engage with the content and arguing strongly about their opinions

Helped the delivery of the curriculum content, as well as raised pupils awareness to real, everyday issues.

reasoned debate

emphasizing with people's points of view

The class enjoyed them. They became very animated and took on their roles and developed good points to debate.

Pupil be able to communicate their ideas and thought

Improving debating skills of my students and allowing them the opportunity to consider many differing points of view. Having the facts in a 'ready to use straightaway' format

Easy to use - balanced arguments - gave info. in a very easy to digest way making the topic more real than if I'd just stood and talked to the class.

a readily available resource

Able to deliver areas of the curriculum which can be difficult to engage pupils with. Good resources which reduce planning time and engage pupils. Particularly useful for my non Biologists who find this sort of area of the curriculum more challenging to teach. Also the fact that the resources are up to date is good.

A good quality resource that engaged the students and prompted participation from all.

getting pupils to communicate their ideas and thoughts to each other

The kit allowed an objective discussion- peronal experiences and opinions were discussed with a greater understanding of alternative views. Students commented that their ' eyes had been opened

A different way of approaching a topic - the students responded in a positive manner to the kits, as it gave them the opportunity to discuss topics in a structured manner

Helping students to see both sides of the argument with difficult scientific situations

Allowing pupils to think of, and discuss, ethical issues

They were able to engage and discuss issues with good prompts to think about who might have an input on certain controversial situations.

enabled strucutred and informned debate. Made planning activitiy MUCH easier and allowed weaker pupils to be more confident about what to say, so livened up their debate and consequently others too

ease of use everything their

Developing students' independent thinking skills - forming an opinion and supporting it with evidence.

A good way to use structured debate as part of AFL at the end of a topic

It provided a good starting point for debate

Being able to listen to all my pupils ideas and getting them to really think about the issues raised from other points of view.

generated an interesting debate

Materials to support a class discussion, raising issues without students having to give own opinion, putting theory into 'real-life' situations

an excellent lesson that I didn't have to make resources for

Supported students through guided discussions. They felt more confident and were visibly more engaged than previously.

Empathy. Students actively needed to take someone else's role, therefore gain a deeper understanding

the pupils are actively involved in their own learning. It opens up aspects that they would possibly not have considered. Makes them think.

Balanced view point.

Pupils engaging in debate about the issues raised - once they got used to the idea of discussion like this in a science lesson, the debate became quite passionate!

pupils discuss and question each other

to have a format for the debate that the kids could use easily

Helps to talk about ethical issues

Helping the pupils to think for themselves about the issues

For pupils to become successful learners, confident individuals, responsible citizens and effective contributors

I realised that it takes much more time for the students to get a handle on it. But when it is set up slowly then they really get it

stimulating debate, students taking a stance they would not have thought of themselves

getting the pupils to see science in the real world. Encouraging pupils to develop a point of view and be ready to discuss it

Gave many discussion points that aided the flow of the lesson.

Allowed up to date science to be discussed in the classroom

That the pupils understand that people have different points of view based on the same facts and that there is no right or wrong answer

The clear characters and view points enables students to explore different view points from realistic, accessible perspectives. Gave them great starting points to validate their own

opinions and encouraged them to see the topics as real issues.

11. Do you have any comments on the design or format of the debate kits?

Could be a little larger to help durability for groups

clear and relevant really good

No, it was excellent

The cards are too small - A4 size would be better

Very user friendly

It would have been more appealing visually if you had used brighter colours.

A little bit too wordy for a lower ability class.

well presented

its good as it is. No need to change it.

The design was accessible and attractive to the pupils I used it with.

I like the format

Very assessable and relevant to young people

no

no

no

no

no

good layout students keen to read facts as well as situation

My students commented that the corners of the cards were very sharp and may be hazardous

to younger children. Students also suggested that a definition card may be useful for reference. Students noted that they would prefer a more professional looking layout. As older students, they would like photographs of real people on the cards, rather than cartoon images. They liked the text and felt that the language was well pitched to suit various levels / ages and they appreciated the diversity of character names I think that the font and format of text is appropriate and effective. I agree with my students that photographs or realistic drawings of characters would be more fitting than cartoon images in this context. The cards are a little flimsy for clumsy teenaged hands and I plan to laminate these cards before next use.

more pictures - more colourful

If this resource was available on line we could make as many copies as we want or even modify it

very well presented

students were engaged by this format

I like it - though it would be good if diffeent kits were diffeent colours.

larger text for SEN

Brilliant!!!

brilliant, esily understood and designed

None

None

None

n/a

n/a

good and eye catching

Love the individual cards that can be handed out to students

more options so it gives more variety in class of 30

Design is really good, appropriate for all age groups at Secondary school

Mostly ok; some thought more visuals might help

The children I work with are SEN and have behavioural problems and although the kit was well designed - it was too wordy for my type of children and so I will adapt it for use with them.

No complaints... all very fun and appealing

The print was a little small for some of our pupils who require specific font sizes - problem overcome by peer assistance and magnifying glasses

Well laid out and nicely designed.

Liked this. In role the pupils had freedom to set aside their own opinions.

Its good

good layout with an eye catching design

Delightfully simple. For the second run through I blew the cards up on the photocopier so a few pupils could read them at once.

Easy to use and handy, although my class was small so we had to double up at times.

Good and clear to read

No. I like the way they are split into viewpoint, fact and issue. This gives teachers more choice about how they use the kits. There could be a summary sheet or worksheet/activity sheet that accompanies the pack, but I am sure teachers can do some things for themselves.

Fine

Our pupils (ASN) had difficulties with the language and the size of the print; they found that there was too much information (text) in too small a space.

Kids liked the pre-printed kits, they thought they were getting the benefit of something we'd paid a lot of money for so it was worth using.

Some older students thought the design was a bit

good design

Keep the wallet idea. Distinctive and very practical

Professional. Possible problems with some SEN students

I think they're great and would love more!

The designs are quite good; but periodical changes would be helpful.

thank you for now producing a large print version we have many visually impaired students at our school

they are excellent - possibly a few photos on them may help

The format works, but it does take some time to go through all the various sections for each character.

Very good.

Like the cards - with some pupils (ie ones who have low ability) they didn't enjoy reading out loud some of the harder words - maybe a differentiated pack could be created for them?

the cards have alot of writing which lower ability pupils find off putting

Thisnk this is fine

The compact nature of the kit makes it easy to store, issue and collect

worked well

The design is clear and well structured.

The design and layout of the kits is good. I like to have worksheets with all my classroom activities, but that would be my only suggestion for improvement.

They are excellent visually and read well.

The kits were well designed and easy to use.

Works really well - clear, logical

I like the role cards.

Larger cad format?

Well laid out, clear for pupils to follow and understand.

Background distracts - have copied some out on plainer card

It's great

I thought they were very good. The option of a larger type version in the new downloadable kit is a very good idea

The design is well thought out and makes the kit easy to use.

Eye catching and easy to read.

Simple and straightforward - worked really well!

There should be a recommendation of which cards to leave out so that the process can be slimmed down.

less crowded information

They are excellent

Very well designed, student friendly

interesting to students

A little wordy for lower ability. Would be nice to have a shortened set.

The discussion cards are great, particularly for older pupils who enjoying discussions

The kits are well designed and laid out.

The design are great; they are colourful, eyecatching and look purposeful.

## 12. Do you have any comments on the content of the debate kits?

Very good - well thought out and presents all sides in a fair light that students will trust

covered all main points

All very relevant and engaging



I would have liked some additional notes to prompt people.

language needs to be simpler for lower ability students

The content was great, very informative, but was a little bit too high level for the year 8 class I used it with - but I plan to use it with higher ability and year groups next term. The character card of the lesbian couple caused some problems - the two girls who had this card were too embarrassed to read it out - key stage 3 students are not always mature enough to discuss such issues and may have quite strong opinions coming from their peer groups. With key stage 4 it will probably be ok. Similarly, the card about the man dying of cancer was a little bit full on, and the teacher needs to be aware of issues which may be relevant to individual student experiences - nothing came up in this particular class - but it struck me that the teacher does need to be prepared for a student to be upset by this and needs to tread carefully. The debate kit would benefit from some words on how the teacher should prepare for issues such as these, and circumstances where certain cards should be left out. The topic really is quite emotional and complicated, so a little more guidance on how to approach these issues would be helpful.

have more copies of the cards

Good range of view points and good characters.

Too politicised. I would prefer topics to be focused on ethics not economics.

very good

very good

good general content

Students felt that they had retained a lot of information by using this kit. The content was neither too light, nor over-laden. I think that the amount of information per card was just right and provided students with bitesize information, without patronising them.

no

no

no

no

fantastic

The content was fine.

Looking forward to seeing future kits

fine had also used video to support topic

Could have included a bit more on how microbicides are put into everything - but what does that do for our normal flora? We need our friendly bugs so the baddies have nowhere to sneak in.

very good all bases covered

None

perfect

perfect

some of the terminology was difficult for lower ability students to grasp. Required the students to do a lot of listening

The are we clean kit could include the issue of using antibiotics and anti-virals - i.e. should we even try to fight microbes with chemicals, why not allow natural selection help us evolve immunity, e.g. immunity to HIV in African prostitutes.

Content really good too, I added some interesting facts too to give the higher ability students a little more to think about, but what is there is sufficient.

fine

Fab!! Such an easy resource to intergrate into a lesson, stuents enjoy using it.

could include more starting onfo for the pupils

A nice range of opinions, well phrased and a good introduction to the language 'real people' use in the 'real world' for our kids to see

May be better with a KS4 class as I thought the content wasn't really clear to year 8 pupils.

Used with top class I used all 8 roles. With junior class will use just 4

IVF was very relevant to the GCSE science course

Some of the cards were a little boring, I got the impression that some of the kids were a bit bored and some of the information was inaccessible for them.

very informative/ well thought out

Once groups started to ask their question, I encouraged the questioning and answering group to follow up with responses to each other - some lively debate blewup which was excellent.

Perfect for my class use

Great.

Content is perfect for stimulating discussion

The content was interesting and varied; sometimes we ended up discussing why people would hold those opinions rather than which was correct; for our pupils this was a valuable exercise in understanding others

Plenty of information, enough to stretch more advanced classes.

very good; enough to get interest going for most and lead them on to their own research.

good

good

Its great. Just want more

Great and relevant

Great ideas, well-set and easy to adapt for different abilities

The contents are reasonably perfect, though one or two bearing closely to areas of controversy.

Good topical choices good level of science

i thought it was fantastic

It was well chosen and suited the class needs.

Could have more of the Kits relating to Science in the News

very enjoyable!

again - fine

Good for the HSW content and Triple Science Biology spec.

Could link to a number of topics in NC

The content introduces a good range of issues.

Content is good and always includes different view points to get the students thinking

Fabulous content on current topics - let's hope there are more! They fit in well with Curriculum for Excellence content too.

Really appreciated the range of scientific and other views given, and the lesson plans were really useful.

Just great - more please

really liked the format SEN VI versions great how about having them available in different languages

Lots of relevant information but not so much that it overwhelms the pupils.

excellent - maybe a bit more scientific information / sheets available for the students to read

Clear instructions, good scenarios for the students to read

Content is pitched correctly for the pupils that it has been used with

Just about the right amount as not too wordy.

Content was really good - as mentioned above, the pupils became really involved and empathised with the 'characters' leading to a really good debate.

Some of the text assumes too much prior knowledge and the reading age is high.

very good - could use even more angles

They are good

Topical issues, very well done

would love more on other controversial issues such as nuclear energy or environmental issues

easy to use, great lesson plans

sometimes a little hard going with a year 7

Good content. Covers a wide range of views.

There is a balanced content in the kit with arguments for and against which is useful. The questions can be used in different ways.

The content is great. We often don't use the questions as the fact and summary of each character's view is enough to sustain an hour's lesson. I think the variation in characters is great; especially giving them jobs which leads us to discuss how science can impact on all aspects of life, and enables more real life information to be pulled into the issues. e.g. the economist and Macmillan nurse in the cannabis debate kit. The variation in the arguments is clear and different which keeps them interesting.

### 13. Can you tell us what you most liked about the kits?

Use of characters to present all sides

it was socially and culturally diverse

ease of use and lesson plan included

The students really engaged and empathised with the characters and helped them to understand the role of science in a wider context than a school room or lab

Ease of use

The equally weighted views

Informative, neat and easy to use.

the design and short sentences

the cards and the information on them

All of it.

Clear and succinct cards that students found easy to use

Very clear format, well designed and easily used.

user friendly

balance of views

The kit made it easier to direct this debate. It allows students to refer to reliable source material.

Easy to use.

the characters

good quality cards with a nice layout

the information

ideas

variation

Topical subject, wealth of background information available, accessible format.

Multi cultural and promotion of gender equality. Good range of experts

design and style

it brought about productive debate within the class

New stuff, new information and ready to use.

Having the different view points and the format with the person, the fact, issue and question

info from different perspectives saves a lot of time trawling internet to find it

the overall look and content was great

the fact that it included points on their that i as a teacher may not HAVE COVERED OR PUPILS RESEARCHED

Simple to use

Layout and role-playing cards. Putting science into real life context so that most kids can relate to something in the scenarios.

The individual character cards with varied points of view

the variation and that its a kinesthetic resource

The way in which it gets the students thinking and allows them to enjoy the lesson at the same time

a bit more fun!

Gave a good range of opinions and views

easy to use

easy to use

easy to use

The different points of view. It meant that students really considered all aspects of this topic.

It was very easy to use and presented no particular bias

The design and it's a ready to use resource.

That the information was short and to the point.

Presentation of cards

Relevant and interesting

Use of characters

a variety of different opinions were presented which was good for the students to look at different viewpoints

Very simple to organise, and to identify for the students what I wanted them to get out of it.

realistic scenarios putting science into context

Easy to use, nothing to print or prepare, small and available

Small manageable size

ready made, good ideas - things that i would not have thought about!

Topics are appropriate and allows all levels to use

got students involved. Generates interest and gives variety to lessons and enhances effective learning.

Ease of use, variety of opinions

Personally, I liked the variety of viewpoints and the balanced gender roles; the facts and questions opened up wider possibilities than just read and vote.

The open ended aspect.

They allowed pupils to engage effectively in groupwork and supplied enough guidance so teacher intervention was rarely needed to keep the pupils on track.

Kids liked the role play and I didn't have to think it up

The range of opinions on each card

Functionality. Unique. Practical Useful Easy to use Free

Time saving, got the students to really think about issues that are relevant to science in society

easy to use!

The direct approach to the issues delt with.

Topical and the level of detail

thought of ideas and points of view that i couldn't

The way in which the whole class becomes involved in discussion.

## LAYOUT, RESOURCES

The ready to use format and the facts presented as though they are the different views of characters.



topical

Clear roles allow the pupils to talk in (and out) of character which encourages them to consider more than one point of view. The scenarios make the work more engaging / real for the pupils

The quality of the resources meant that the students were able to access the information and return the resource in the exact condition it was issued.

Pupils enjoyed a different way of learning (from each other)

I have conducted debates on IVF before, but found using the kit was less contentious and provoked thought and discussion on a wide range of issues. An excellent resource suitable for all abilities- the discussion could be steered to bring in aspects of the scientific background relevant to different abilities/ levels of courses.

Scientific topics covered using everyday examples and lots of different view points that the students likely haven't considered.

The amount of information given and how life like the views were.

Accessible information and discussion points - a well-designed classroom activity.

The range of different viewpoints written clearly for students to read and discuss.

see previous boxes

format ease of use

Ready to use

I liked the format of the kits - the role cards and the brief lesson plan.

Really clear information

They enable pupils to really consider other people's points of view, that they probably wouldn't have thought of before.

Enables pupils to make decisions, which are often controversial as there is no one 'right' answer, for themselves. Provoke pupils to see others' points of view.

current topic presented in a relevant format, and particularly applicable for How Science Works

Ease of use and clarity.

Good range of stakeholders represented enabling a variety of positions to be adopted/covered

It allows a structured debate (which is not something that we do much of in Science) and so it is something novel, which motivates the pupils

Simple, easy to use with all pupils. Really highlighted the discussion points raised by these ethical issues.

nicely presented and pupils could identify with several of the characters

As before helping pupils to think about the issues themselves

good for discussion and seeing other people's point of view

They gave a great balanced view of the topics

Helps students to think and talk about ethical issues

the basis for a structured discussion where the students could see the other points of view

Easy to use, took me 10 mins to read over the plan and I knew exactly what I was doing

already done for you. topical subjects they have seen in the news.

Lots of info. Headings allowed to direct lower ability to key points.

The up to date materials covered and the fact that ethics issues can be discussed

It saves me having to research contentious topics, this normally takes a long time as there is a lot of material on the internet about them.

They are easy to use, topical and students have responded to them really well, opening up and sharing thier own views and critically, yet sensitively, evaluating the views of others. I like the variation of information within each kit that enables you to go off the beaten track discussing life choices, careers, relationships etc without going off task! Its gives purpose and format to important discussions.

#### 14. Can you tell us what you most disliked about the kits?

Nothing major but felt it might not last for too long in kids hands

nothing

nothing

nothing

nothing

nothing

nothing

nothing

nothing

nothing

nothing

nothing

nothing

nothing

nothing

nothing

nothing

The graphics.

As already discussed, it needs a little more guidance on dealing with emotional (non-scientific) issues.

pupils didnt relate to some of the people as some of the content/terms was confusing to them

not enough cards to go around a class of 30

Nothing.

## Content

colours on packaging

I disliked the cartoon images of characters, as I feel this impacted on the tone of the activity, lending a

could have done with more sets.

the presentation - however I still liked this

not enough in depth

Nothing . Could I please have 5 more sets?

N/A

N/A

N/A

small size

maybe a few more characters for very big classes

Difficult to know when the kids should debate as their character and when they should be encouraged to just discuss their own views

not wide enough variation within the kit to use again with the same students

There is nothing I disliked about the kit.

maybe a little more hard science

A bit too wordy for the kids I work with - needed more picture less dialogue

Background information is very brief. i used the bbc web-site and other resources to give the students a better understanding of the topic before we began the debate.

Apart from the print size issues - which are common with resources - nothing at all

The point of the debate was a little weak.

Nothing as yet.

Nothing as yet.

Possibly too much information per card; could have more characters and spread the information out differently.

A bit more (irrelevant) personal detail about the characters featured. I tried to encourage the pupils to think their way into the character but there wasn't much there for them to empathise with.

They were difficult for our pupils to access; this was a pity as when we discussed it (using adults as readers) the pupils were genuinely interested

Some of the colouration; I am colour blind.

There was a lot to read before getting started

Need more copies of the cards

Having to download them - prefer the wallets

not much to be honest

None, really!

they were a bit small but now you have a larger print version

they looked slightly too similar to one another

They have improved to become more user friendly ie accessible to students. One of the early debate kits was too detailed for students to use.

Some pupils disliked reading so much (or found some words difficult to pronounce)

too much writing on cards

Can be intimidating to quieter pupils who can get left out if you don't actively engage them

Nothing !

Nothing - superb all round.

none

Size

They were easier to use when they were supplied as printed copies rather than having to print ourselves - our printing really reduced the quality.

lots of writing

The graphics. The cartoon images may have set a less serious tone than, say, a mixture of photographs and graphics may have created.

Nothing. Very useful

There was nothing that I disliked

At this point not much to dislike - perhaps a few more 'characters' would be useful for use with larger classes to avoid large groups.

with large classes it takes far too long for each of the characters to summarise their position. People lose interest

kids need to be trained

nothing!

A little wordy.

It requires the pupils to read the cards which can be difficult for some especially the technical vocabulary, a video representation would be useful for the lower ability pupils. Pupils expect a lot of interaction in their lessons.

There aren't more of them! We use AQA and IVF, Cannabis and Antimicrobial cleaners are all in the same module. We need more for other modules so that we can space out the use of them so they remain effective and exciting!

### 15. Are there any other comments you'd like to make?

For your reference I'm a STEM Ambassador not a teacher so please take feedback in context

more please

I look forward to the next kit - I really do think they are a great idea and can work well with

the right groups.

Lent the kit to our RE teacher who used it with a class of Yr10 GCSE RE students as part of their debate on the morality of IVF

no

no

no

I will have more feedback in a few weeks when i have used it in the correct sequence

I think that these kits are a fantastic idea. Having a set of reliable reference material in a pre-prepared format lifts such a weight from teachers. The kit allows teachers to maintain control, whilst avoiding excessive input to a student-based activity. Students left to research a subject alone will all too often come up with false information or arguments based only on their own opinion, whilst for teachers making up information sheets / nuggets for reference, it is very hard not to feed students the conclusions that they wish them to draw. The kit provided a neutrality to teachers that is very comfortable for all concerned.

this is great I couldn't have done a debate without it

Would love to use more often, but we are limited in the time we can allot to the activity. Good prep for pupils being interviewed for entry to Medicine? More Chemistry topics would be useful.

Conratulations for making our job a lot easier and encouraging me to use active learning

Looking forward to the next one.

I teach at a special school so would prefere larger text

I love it !!!!

Can you make some more please?

I have used these kits and actually produced 2 of my own based on the idea, I think they are a really good resource and my students really enjoy doing the activities based around them.

when can we have some more?

Thankyou so much - perhaps you could develop some resources to be used with SEBD kids

A differentiated version for poor readers would be great, but the kit as is was a worthwhile activity and a good introduction to debates in science

We have little time to use this type of resource in our GCSE class due to pressure of modular system and our timetable. We would have more time with our KS3 class but would need a topic relevant to the N.Ireland curriculum.

looking forward to using the other kit as well as using the IVF kit again with y13 and Y11 want to do it again- thought we could get more into character by using props.

Thank you for the chance to use it.

very useful resource - keep them coming!

thanks

I sincerely hope you get more funding for further kits as they are a valuable resource; if ADN children can get so much out of them the benefits for pupils who can access them fully must be at least as valuable

Please get some money to do more!

Great idea- thanks for planning a lesson for me!!

Good luck with finding further funding

Look forward to more discussions, though, I dare say, in this era of cuts and slashes, a very slim chance!

Having them as ecopies is actually more useful in many ways - they don't get lost or squashed, can project parts on the whiteboards easily

Thank you!

Thank you for producing them.

Really hope you get funding to continue to produce this valuable resource

Please bring out more!!! These are extremely useful and a type of resource which sadly is scarce in schools at the moment.

n/a

I, my department and my pupils really value the kits and I feel that we have got a lot out of



using them over the years.

keep 'em coming!

I hope that you will continue to develop these lovely resources. Have you considered

A good idea that opinions of teachers of which topics to cover in new kits was sought/surveyed

I would like to see it continued

Let's have some more! Found them useful/inspiring and the pupils gave positive feedback.

I keep forwarding your emails to teaching staff don't know if they reply I am the technician

Such a fantastic resource for teachers, and science communicators. I hope there are plenty more in the future

More kits will be good

Keep them coming

They are brilliant, please find funding for more!

## Appendix 3: Responses to the random sample survey

A random sample of 50 teachers were asked which (if any) debate kits they had used.

	Physical kits sent	Campaign replied to	Number of kits used	Physical kits used	Online kits used	Kits used A-IVF, B-Clean, C-Stem Cells, D-Cannabis	Other Comments
1	3	Email 1	0	0	0		
2	3	Email 1	0	0	0		Was senior technician so passed them onto teachers. Thinks they were used
3	3	Email 1	2	2	0	A C	
4	1	Email 1	1	0	1	A	
5	1	Email 1	2	1	1	A C	Plans to use cannabis one in PSHE
6	2	Email 1	0	0	0		
7	1	Email 1	0	0	0		
8	1	Email 1	0	0	0		Hopefully use stem cell one soon.
9	2	Email 1	1	1	0	C	
10	1	Email 1	0	0	0		Only has Stem Cell one and has not used yet
11	1	Email 1	0	0	0		Checking if have been used
12	2	Email 1	0	0	0		
13	2	Email 1	2	1	1	A C	Will use the others when appropriate. Have found the kits to be very useful in stimulating debate and consider them to be a good resource.
14	2	Email 1	1	0	1	A	
15	2	Email 1	3	2	1	A B C	
16	2	Email 1	2	2	0	B C	PSHE department may use cannabis one in future
17	2	Email 1	1	0	1	A	Plans to use them all once returns from maternity leave.
18	3	Letter 1	0	0	0		
19	3	Letter 1	0	0	0		Unfortunatley I have moved away from Biology teaching into animal conservation/environments - But would have used them if I had the opportunity
20	3	Letter 1	2	1	1	C D	
21	2	Letter 1	2	1	1	A C	
22	2	Letter 1	3	2	1	B C D	
23	1	Letter 1	2	1	1	A C	
24	1	Letter 1	1	1	0	C	
25	3	Letter 1	2	2	0	B C	
26	1	Letter 1	1	1	0	C	It was excellent. Well presented and easy to use. Thanks.
27	3	Letter 1	2	2	0	A C	
28	2	Letter 1	0	0	0		None as yet
29	2	Letter 1	2	1	1	A C	
30	1	Letter 1	2	1	1	A C	Apologies, internet issues!

31	1	Letter 1	4	1	3	A B C D	
32	1	Letter 1	1	1	0	C	
33	1	Letter 2	1	0	1	A	Really good way of getting pupils to think, rather than just absorb
34	3	Email 2	2	2	0	A C	
35	1	Email 2	1	1	0	C	
36	3	Email 2	0	0	0		
							I've used A and C would like to use Are we too clean as it looks good but not had the right class yet. Haven't looked at the cannabis one yet.
37	3	Email 2	2	2	0	A C	
38	3	Email 2	2	2	0	B C	
39	3	No reply					
40	3	No reply					
41	2	No reply					
42	2	No reply					
43	2	No reply					
44	2	No reply					
45	2	No reply					
46	1	No reply					
47	0	No reply					
48	0	No reply					
49	3	No reply					
50	0	No reply					

## Appendix 4: More details on the four kits

### Kit 1: IVF

**Debate question:** Should IVF be available on the NHS?

### Curriculum points covered:

#### *How Science Works*

- Using data to draw conclusions
- Societal aspects of scientific evidence
- Developing an argument

#### *Substantive*

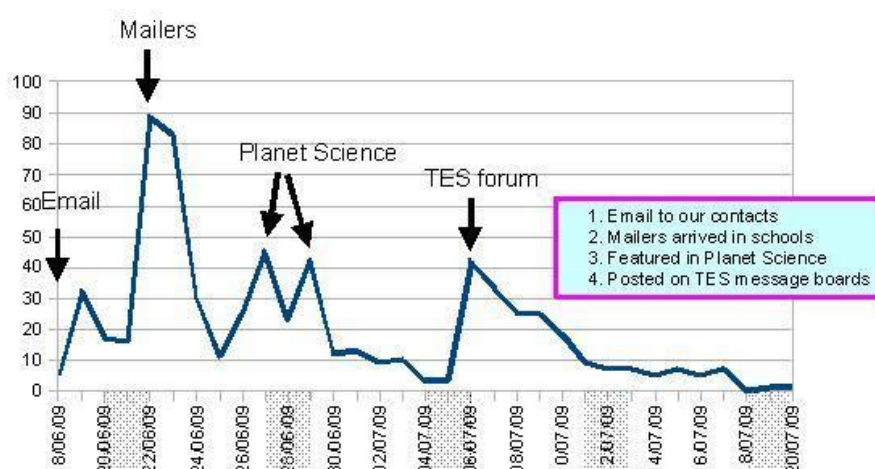
- To evaluate the benefits of, and the problems that may arise from, the use of hormones to control fertility, including IVF

**Topic choice and development:** This kit was the original one developed for the I'm a Scientist, Get me out of Here! pilot. The topic was chosen and the kit written in consultation with our teacher panel for that event.

**Distributed:** 1,450 copies were sent out in July 2009 (500 were sent, unsolicited, to Heads of Science at the largest schools and specialist science colleges, and various education contacts we'd identified. The other 950 were sent in response to orders from teachers.)

**Downloaded:** 1,299 times.

**Promoted by:** 5,000 direct mailers sent out to UK secondary schools, plus various online marketing. The graph below shows which activities had the most impact. Many other activities had no measurable effect (although they may have contributed to people's willingness to order the kits).



## **Kit 2: Are we too clean?**

**Debate question:** Should we ban advertising of antimicrobial cleaners?

### **Curriculum points covered:**

#### *How Science Works*

- Using data to draw conclusions
- Societal aspects of scientific evidence
- Developing an argument

#### *Substantive*

- What can we do to keep our bodies healthy?
- What causes infectious diseases and how can our bodies defend themselves against them?

**Topic choice and development:** On our blog we invited teachers to suggest topics and then vote on the shortlist produced.

**Topic suggestions:** <http://project.imascientist.org.uk/2009/09/help-us-decide-the-topic-for-the-next-debate-kit/>

**Voting:** <http://project.imascientist.org.uk/2009/09/vote-for-what-the-next-debate-kit-will-be-on/>

This meant we knew we were covering a topic that teachers actually wanted. We invited all teachers who had signed up for the first kit to participate. 336 people voted in the poll on the topic, which is a pretty high level of engagement.

The kit was developed in consultation with Dr Mark Roberts, a microbiologist who had taken part in the IAS pilot, and with the Society for General Microbiology.

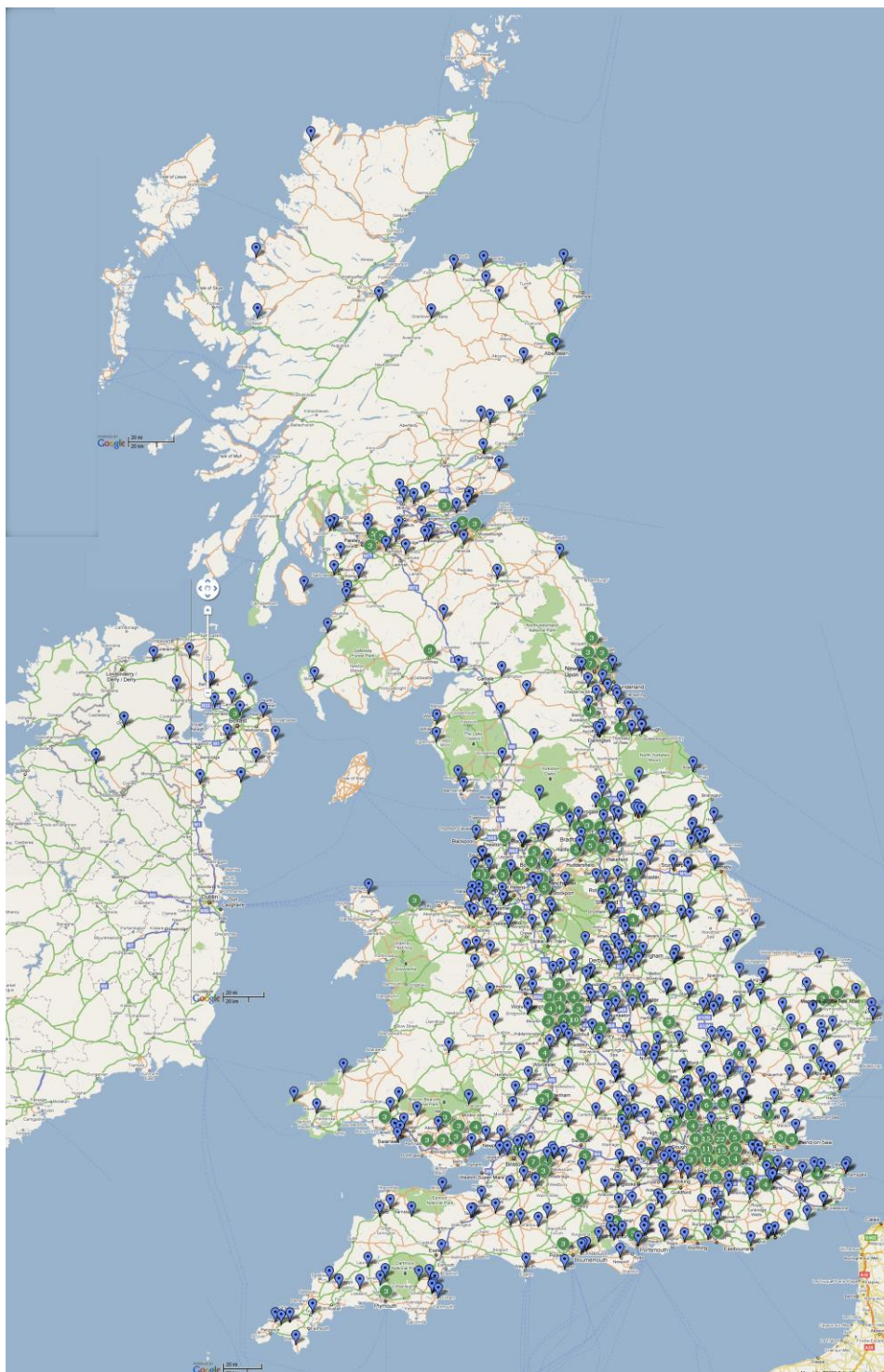
**Distributed:** In October 2009 copies were sent out to the 1,351 people signed up for the kits by this point.

**Downloaded:** 826 times

**Promoted by:** Emailing existing signed-up teachers and our other contacts, inclusion in Planet Science newsletter, posting on the TES messageboards, twitter and our blog. We also worked with Aimhigher and had a special priority order form online for teachers at Aimhigher target schools. However, this was not well used and we concluded that Aimhigher was not an effective route for promoting the kits.

At this point we analysed the geographic distribution of those ordering kits and found no major gaps when compared to population densities across the United Kingdom.





**Map showing the postcodes debate kits had been sent to.**



### **Kit 3: Stem Cells**

**Debate question:** Should the UK government fund embryonic stem cell research?

### **Curriculum points covered:**

#### *How Science Works*

- Using data to draw conclusions
- Societal aspects of scientific evidence
- Developing an argument

#### *Substantive*

- What are stem cells and what might they be used for in the future?
- What ethical issues do stem cell treatments raise?

**Topic choice and development:** This was the second most popular topic when we were choosing kit 2. We wanted to get the kit out well before the end of the summer term, giving teachers plenty of time to use it. We were also running our biggest ever I'm a Scientist event. So rather than go through the consultation process again we decided to use this topic.

The content was developed in consultation with Sharon Sneddon, a scientist working on ethical ways to produce stem cells, who had taken part in I'm a Scientist, and also in consultation with Edinburgh's Centre for Regenerative Medicine.

**Distributed:** Copies were distributed in two batches – June and November 2010 - to the 1,624 people who had signed up to receive kits.

**Downloaded:** 739 times

**Promoted by:** Planet Science newsletter, TES messageboards, twitter and our blog and emails to our contacts, also to all area science co-ordinators and initial teacher training providers in science. Also, we were very fortunate to receive a glowing review of the kits in the March edition of School Science Review (the journal of the Association of Science Educators).

<http://project.imascientist.org.uk/2010/05/best-review-ever-ias-debate-kits-in-school-science-review/>



### **Kit 4: Cannabis**

**Debate question:** Should the UK legalise cannabis?

### **Curriculum points covered:**

#### *How Science Works*

- Using data to draw conclusions
- Societal aspects of scientific evidence
- Developing an argument

#### *Substantive*

- Why do some people use recreational drugs and what harms (both medical and social) may come from this?
- To evaluate the claims made about the effects of cannabis on health.
- Discuss the consequences of the legal classification of drugs.

**Topic choice and development:** Again, we asked teachers to suggest topics, and then vote on the shortlist.

Topic suggestions: <http://project.imascientist.org.uk/2010/10/help-us-decide-the-topic-for-the-last-debate-kit/>

Voting: <http://project.imascientist.org.uk/2010/11/vote-to-choose-topic-of-the-last-debate-kit/>

They cast 406 votes in total. Legalisation of cannabis narrowly beat nanotechnology, by 54 votes to 50. The content was developed in consultation with the Drug Education Forum (a forum of national organisations committed to improving the practice and profile of drug education in England).

**Distributed:** This kit was not printed, but was available for download only. Our grant covered the development, printing and distribution of three kits. As the first kit had already been developed for I'm a Scientist, we developed this fourth kit, for online distribution only.

**Downloaded:** It was published in November 2010 and has since been downloaded 1,232 times.

**Promoted by:** On twitter, on psci-comm, to our database of education contacts (including all science teacher training providers and LEA science co-ordinators) and on the TES message board. Plus by the Drugs Education Forum to their network of practitioners (e.g. in their newsletter). Given the high profile subject matter, the link to download the resources was very popular and was retweeted 54 times on twitter.





## Appendix 5: What are the debate kits?

### Key facts

**Science Debate Kit:** Free teaching resource.

**Activity:** Role play on biomedical topic which raises scientific, social, economic and ethical issues.

**Kits contain:** 8 character cards, lesson plan, background information, wallet holder.

**Time:** Approximately 1 hour.

**Age:** Designed for KS4, have been used for ages 11-18.

**Aim:** Promote discussion skills.



"I thought the IVF cards were brilliant for debating. It made the debate run smoothly and showed them clearly how different people have different points of view. By giving more info gradually, the pupils started to think about each situation and change their opinion with justification."

*Danielle Fox, science teacher, Winterhill School, Rotherham*

**How the kit works:** The eight characters all raise different issues or points of view in the debate. Students role-play the different characters. Half of the characters are arguing for the question, and half are against, but for different reasons. In smaller groups the teacher can just use half of the characters.

**Introduction:** Each card begins with a short narrative which introduces the character's point of view and why they are concerned about the issue. In the first round students read these out.

**Debate**

**Jess Baker - Probation Officer**

I work with young people who've been released from prison. Going to prison can be a horrible experience for a young person and very destructive. It interrupts their education, brings them into contact with more serious criminals and gives them a criminal record which can make it hard to get a job.

**Fact:** 8.9% of 11-15 year olds say they have smoked cannabis in the last year.

**Issue:** Using cannabis is quite common – It breaks my heart to see so many young lives ruined for something I personally think is not that serious a crime.

**Question:** People say it's a 'gateway drug', but the evidence is weak that using cannabis CAUSES people to then use harder drugs. Most people drink alcohol before they try any other drugs. Is alcohol a gateway drug, or is it just widely available?

**I'm a Scientist Get me out of here**

**Fact:** In the second round, each character reads out their 'fact'. This is new information about the topic, which could support that character's position.

**Issue:** In the third round each character reads out their 'issue' with the proposal.

**Question:** In the fourth round they read out a question, which they direct to one of the other characters.

Because the facts come out gradually during the debate, students retain more information, and feel that they are discovering things and all contributing (rather than the teacher being the source of

all information).

Each kit is clearly marked with the curriculum points it covers. The teacher notes include a lesson plan, facilitation tips, background information and suggested homeworks.

## **Appendix 6: Self-reflection statement**

This evaluation was carried out by the person who came up with the idea for the debate kits and has run the project (Sophia) and by another employee of the I'm a Scientist project (Rosie). We have therefore a clear potential for bias. Given the financial constraints on a project of this size (we cannot afford an independent evaluation) this is somewhat unavoidable.

### ***How we addressed this: Summative evaluation***

We have therefore included as much raw data as possible in the appendix to the report, so that others can make their own judgement about whether we have summarized the findings reasonably. The summary of all feedback in Appendix 1, and coding of responses, was prepared by Rosie, only two weeks after starting work at Gallomanor, as she was likely to be least biased. Also, ALL text responses are included in Appendix 2.

Furthermore, the feedback on kits 1 and 2, which was used to prepare the interim report was very useful formative evaluation, while the project was still ongoing. There was therefore an incentive for Sophia to interpret this as accurately as possible, in order to improve the project. Several changes were made to the kits as a result of this feedback.

### ***How we addressed this: Formative evaluation***

During the life of the project we also employed Ian Francis (an experienced teacher) as an education consultant. Ian gave feedback on each kit at draft stage and suggested changes. While Ian is a former classmate of Sophia's on the Imperial MSc Science Communication course, he was appointed particularly because his markedly different views and interests provided a useful counterweight.