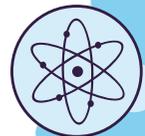


Lesson Plans



Lesson	Format	Suggested adaptations
<p>Lesson 1 – You're the judges! Choose and rank criteria by which to judge the scientists</p> <p>Learning objective: Consider a range of criteria and understand that different (important) values may need to be weighed against each other.</p> <p>Other learning outcomes:</p> <ul style="list-style-type: none"> • Encourages students to consider criteria to use in deciding which scientist to vote for and how to judge their work. • Promotes use of sophisticated criteria, not trivial issues. • Gives students ownership of criteria. <p>Curriculum links:</p> <ul style="list-style-type: none"> • Introduction of HSW • Consider ethical social and practical aspects of science. <p>Resources: List of criteria</p>	<p>Starter: 5 minutes. Explain the I'm a Scientist event briefly (show site on projector/interactive whiteboard if poss) - students will get to 'meet' a group of scientists and then vote for which one they think should get some money. They have the power! What things will they judge them on? What will change their opinion of them?</p> <p>Main Activity: 35 minutes.</p> <ol style="list-style-type: none"> 1) Read list of criteria. 2) Students vote with show of hands whether those qualities are IMPORTANT or NOT IMPORTANT. Get students to discuss why for each one. Aim for about 10-15 important. 3) Get the class to whittle it down to five most important criteria – students can suggest ones they think should definitely go or stay and give a reason. Write these five qualities on board. 4) Rank the five qualities on a scale of most important to least important. Discuss why for each. <p>Plenary: 10-15 mins.</p> <ul style="list-style-type: none"> • What kind of information will this give? • Any other criteria? • Overall message: Will help you judge scientist as a scientist. <p>Suggested Homework: Make a list of 5 other criteria that would be important to judge the scientists on. Look at the website and note how each scientist performs on the criteria you have picked. Submit questions to find out more if there's not enough information.</p>	<p>Support Less justification necessary. Lead students into the rationale behind their decisions.</p> <p>Extension: Starter: What areas of science are you judging? Will be scientist's ethics, fair testing, and social issues.</p> <p>Main activity: Ensure full justifications and explanations are given whenever they express an opinion.</p>



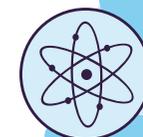
IVF Debate

Lesson	Format	Suggested adaptations
<p>Lesson 2 - IVF Debate A structured practice debate on a controversial topic</p> <p>Learning objective:</p> <ul style="list-style-type: none"> To practise discussing and debating issues and expressing an opinion Understand the arguments for and against In Vitro Fertilisation (IVF) <p>Other learning outcomes:</p> <ul style="list-style-type: none"> Students realise that experts are 'human' – having info makes you the expert. Realise that data can be presented in different ways, depending on the point you want to make Consider social, ethical and factual issues in an integrated way <p>Curriculum points covered: HSW</p> <ul style="list-style-type: none"> Using data to draw conclusions Societal aspects of scientific evidence Developing an argument <p>Substantive</p> <ul style="list-style-type: none"> To evaluate the benefits of, and the problems that may arise from, the use of hormones to control fertility, including IVF <p>Resources: IVF card game.</p>	<p>Starter: 5 minutes. What is IVF? Why do people have such different opinions about IVF? IVF covers issues that affect many people. Sometimes the best way to know how someone else feels is to assume his or her point of view.</p> <p>Main Activity: 35 minutes.</p> <ol style="list-style-type: none"> Split students into as many groups as the policy points you want to cover, and arrange them so they are in their groups at different points around the classroom. Give them their character cards – one per group, and give them a few minutes to read them over as a group. Get one of the students in each group to read out their positions to the rest of the class. What are the class's initial thoughts? Is there one position they identify with? Take it in turn to read out their fact. Does it change the way they think? Read the issue? Any different feelings? Read the question to teams they feel it is most relevant to. <p>Note – This resource is flexible and pupils can assume the roles all the way through and answer questions accordingly, or just assume the roles for the first read out. If pupils do assume the roles all way through make sure you get them to express their personal opinion at the end of the discussion and in the plenary.</p> <p>Plenary: 10 minutes Vote as to which position they agree with most if there is one? Why? Which arguments were the most persuasive?</p> <p>Suggested Homework: Students (in groups) make a poster/collage arguing for their characters' position.</p>	<p>Support Help to structure discussion further by giving the 'prompt sentences' to pupils you think would need them or write them on the board so pupils can see them the whole time, and follow the sentence structure.</p> <p>Extension: Read out all of the card initially. Allow to debate more freely.</p>



Meet the Scientists

Lesson	Format	Suggested adaptations
<p>Lesson 31 - Meet the Scientists Scientific speed-dating, a fun, exciting way to 'meet' the scientists</p> <p>Learning objective:</p> <ul style="list-style-type: none"> • Get to know the scientists in-depth in structured way <p>Other learning outcomes:</p> <ul style="list-style-type: none"> • Stimulate interest and raise questions they may want to ask. <p>Curriculum points covered:</p> <ul style="list-style-type: none"> • Select, organise and present scientific information. • Evaluate scientific information and make informed judgements from it <p>Resources: Questions sheets from this pack and either allow pupils to visit the website (if in ICT suite) or give out downloads of scientists' information pages. Paper and pens for drawing scientist.</p>	<p>Starter: 10 minutes</p> <ol style="list-style-type: none"> 1) Tell students they will be getting to know the scientists. Split students into 5 groups and number them 1-5. 2) Ask them to think about what they imagine scientists are like. Draw a scientist as a group. Starting at the top, each person in group draws different part of scientist (head, shoulders, etc) without others seeing, folds over what they have done and passes it on (like a game of consequences). 3) Unfold and look at the pictures – any common themes? Do they think scientists are really like that? 4) Assign each group a scientist and read out their name and job role. 5) Remind about what criteria they picked in the lesson 1 <p>Main: 30mins</p> <ol style="list-style-type: none"> 1) Read info sheet/site as a group. 2) Split each group in half, As and Bs, to end up with 10 groups in total. As are the scientists, using the sheets they were given originally and 5 B groups go around and question scientists using assigned and own questions. Scientists use sheet to answer. If the answer is not available the group can speculate as to what the answers could be. Pupils have 3 minutes with each scientist. <p>Plenary: 10 minutes</p> <ol style="list-style-type: none"> 4) All the students discuss the scientists as a class. Go over the questions for each scientist to make sure they got the right answers. Did they like the questions? Did they feel they got to know the scientists? Would they ask similar questions or others? <p>Suggested homework: Think of three questions to ask the scientists and ask them on the website. Write a profile of famous scientist using books/internet or given info - Stephen Hawking profile – http://www.hawking.org.uk/text/about/about.html</p>	<p>Support: Do the activity as a class with the five scientists at the front. 2 or 3 play each scientist.</p> <p>Extension: Concentrate more on their own questions rather than assigned questions. Go back onto the site and submit some questions for scientists.</p>



Intro to event



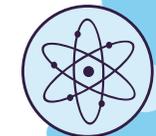
Lesson	Format	Suggested adaptations
<p>Lesson 3ii - Intro to event (This is a simpler alternative to lesson 3i as a way of getting to know the scientists)</p> <p>Learning objective: Get to know scientists and realise they are normal people!</p> <p>Other learning outcomes:</p> <ul style="list-style-type: none"> • Stimulate interest and raise questions they may want to ask. • Opportunity to interact with real scientists. <p>Curriculum points covered:</p> <ul style="list-style-type: none"> • Select, organise and present scientific info • Evaluate scientific information and make informed judgements from it. <p>Resources: Pupils own pen and exercise book. ICT suite or computer and screen projector class all do together with teacher leading.</p>	<p>Starter: 5 minutes Recap the event, and what can be done on the site. Can also use 'fold game' starter from lesson 3i.</p> <p>Main: 35 mins</p> <ol style="list-style-type: none"> 1) As a class brainstorm suitable questions that they want to ask to get to know the scientist. Get students to write them all down. Appoint a question to each pair to ask when they use the site. 2) Take students online, (in pairs or threes in ICT suite or all look at site together on projector) and read profiles of all the scientists and the info on the site. See if the impression they get of them is different from the last lesson. Decide which scientist they like the best. 3) Write down three interesting things they find out on the site. 4) Pose brainstormed question, and one of their own for the scientists to answer when they use the site. 5) Present their 3 interesting things to the class, and which scientist they like best. <p>Plenary: 5 mins Discuss what they found out – did anything surprise them?</p> <p>Suggested homework: See if the scientist has answered. If so write down answer. Pick one of the scientists. Find out about their area of science and write a page about it, including:</p> <ul style="list-style-type: none"> - What they study in that discipline - The kind of places it is carried out - The most famous of those places. - A famous scientist from that discipline 	<p>Support: Give more assistance in brainstorming questions. Use the criteria from lesson 1 and assigned questions from lesson 3i as a basis.</p> <p>Extension: Allow more freedom when looking at the site. Write a short paragraph about what they find on the site to present back to the class. Justify more clearly which scientist they like best.</p>



Live chat



Lesson	Format	Suggested adaptations
<p>Lesson 4 - Live chat ‘Chat’ to real scientists online in real time.</p> <p>Learning outcomes: Humanise scientists and science</p> <p>Other learning outcomes:</p> <ul style="list-style-type: none"> • Get to know the scientists • Prompt thought about questions • Opportunity to interact with real scientists <p>Curriculum points covered:</p> <ul style="list-style-type: none"> • Apply principles and concepts to unfamiliar situations • Make informed judgements about science <p>Resources: Live chat booking (important!). ICT suite (or whole class do it together via projector screen).</p>	<p>Starter: 5 mins Go over criteria from lesson 1, assigned questions from session 3i and the brainstormed questions from lesson 3ii. In this lesson they can get to know the scientists better, in real time! Remind they have a big responsibility because they get a vote to decide who gets the money! NB Scientists are busy and working full time, it’s likely not all will be able to make every chat booked so try to adjust the classes’ expectations. The important thing is they get to ‘meet’ real scientists and find out they are human too!</p> <p>Main: 35 mins</p> <ol style="list-style-type: none"> 1) Go online and have a live chat with the scientists. Ask questions as individuals, pairs or small groups. 2) As groups of 4, write a summary of what they have learnt and present to class. <p>Plenary: 10 mins Sum up what they know about the scientists. Any other questions they didn’t get to ask? Did they learn anything that surprised them? Remind them they can pose questions at home if they have the internet.</p> <p>Suggested homeworks: Pick one of the scientists’ disciplines. Find out more about a controversial issue facing that discipline. Base it on topics covered in live chat if any arose. If none arose write about the biggest issue facing that discipline.</p>	<p>Support: Use brainstormed questions and write down the answers to them.</p> <p>Extension: Not so much reliance on assigned questions.</p>



Interactive quizzes

Lesson	Format	Suggested adaptations
<p>Lesson 5 – Interactive quizzes Online quizzes to test comprehension and understanding</p> <p>Learning objective: Check understanding of info sheet topics/HSW issues, as below.</p> <p>Other learning outcomes: All: Develop student's HSW skills, engage their interest. A-C: Test students understanding of the info sheet topics C: Prompt harder questions to scientists (i.e. on key data handling concepts – validity, reliability, accuracy, etc) D: Check and develop understanding of key HSW principles E: Practice at separating fact and opinion</p> <p>Resources: ICT suite or projector, or printed out paper copies of quizzes.</p>	<p>Starter: 5 mins Students know the scientists and what the scientists do. See some real life examples of what scientists do, and the things they have to think about.</p> <p>Main: 40 mins In ICT suite, on paper copies, or as homework. Get students to do quizzes (as many or few as you think they can manage), individually or in small groups (online versions are interactive and give correct answers and score).</p> <p>One on each info sheet:- A) Drug development B) Generating electricity C) Data handling</p> <p>Further quizzes on:- D) What is science? E) Fact vs. opinion</p> <p>Plenary: 5 mins How did they do on quizzes? Did anything surprise them?</p> <p>Suggested Homework: Complete further quizzes Find a newspaper article about something to do with science (possible sources in 'more info' section on website). Highlight facts in one colour; opinions in another.</p>	<p>Support: Set only one quiz for the lesson AND/OR Have info sheets in front of them when answering (for quizzes A-C) AND/OR Complete quiz(zes) as a class.</p> <p>Extension: Set more quizzes (five available)</p>



Project analysis

Lesson	Format	Suggested adaptations
<p>Lesson 6 – Project analysis A structured way to look back on the project and analyse it</p> <p>Learning objective: To reflect on and consolidate own learning during the project.</p> <p>Other learning outcomes:</p> <ul style="list-style-type: none"> • To consider the benefits of the project and highlight problems or difficulties • Empower students (it's not perfect, their opinion is useful!) • Give feedback so project can be improved in future • Consider purpose – does it matter if their favourite didn't win if they learnt things and enjoyed it? <p>Curriculum points covered:</p> <ul style="list-style-type: none"> • Society and individuals make decisions on issues relating to science and technology • Different issues need to be weighed up and this can be difficult <p>Resources: Photocopied project analysis sheets, or online feedback forms, if in ICT suite.</p>	<p>Starter: 5 mins Show of hands, did they enjoy it? Initial thoughts on why/why not?</p> <p>Main activity: 40 mins Discuss further. Supply some probing questions – did their favourite win? Why or why not? Do they all agree on who their favourite was? What did they learn? Did they enjoy it? What do they think about science now? How would they improve the project? What does it make them think about the people who decide which science to fund? Is it easy to decide? Distribute the project analysis sheets (or take students to online survey if in ICT suite) and encourage students to fill them in sensibly.</p> <p>Plenary: 5 mins Quick show of hands and discussion. Would they want to do it again?</p>	<p>Support: Fewer questions – did their favourite win? What were their favourite and least favourite things about the project? What was most memorable or surprising?</p> <p>Any: Rather than whole class discussion, get students to discuss in pairs or fours, then feedback to whole class.</p>

