Topic 1

The Germ Theory of Disease
Scheme of Work Suggested scheme of work for teaching the topic. http://www.scienceinsocietyadvanced.org/as/topics/the-germ-theory-of-disease-sow,45,AR.html
Introduction to germ theory PowerPoint slides This short set of power point slides presents data on changing causes of death in the UK since 1850 and invites discussion on these changes. It then introduces a comparison with Kenya today. It is a good way of introducing themes that will be important through several topics. http://www.scienceinsocietyadvanced.org/as/topics/the-germ-theory-of-disease-activities,43,AR.html
LSS: Believe it or not Activity Students examine the claims to truthfulness of statements of different kinds. The aim is to become more critical of the use of language and to develop a constructive scepticism when assessing primary and secondary information. http://www.scienceinsocietyadvanced.org/data/files/believe-it-or-not-classifying-statements-301.pdf
John Snow and epidemiology Activity This activity extends the textbook account of John Snow's work with a description of his epidemiological work in South London, including quotes from Snow himself. It encourages group discussion of his methods and some of the data he collected. http://www.scienceinsocietyadvanced.org/data/files/john-snow-and-epidemiology-85.pdf
LSS: Information revolution This activity is about information storage and retrieval, about books and journals, and about comparing print with electronic information storage. Information storage is in the process of transforming how we behave, both because of the ongoing explosion of the quantity of information available and because of increasing ease of access. http://www.scienceinsocietyadvanced.org/data/files/the-information-revolution-298.pdf
Koch and tuberculosis Activity This account describes Koch's discovery of the TB bacillus and introduces Koch's postulates. It provides another example of the use of experiments to extend understanding of germ theory. The comprehension questions could be used as homework, review or revision. http://www.scienceinsocietyadvanced.org/data/files/koch-and-tuberculosis-87.pdf
LSS: Using the internet to find information Activity Students first carry out an Internet search to find web sites that would be helpful to answer specific questions about a science topic. In the second part of the activity, students refine their search using a Boolean-style approach, outlined in the briefing sheet. The students then complete a related homework task. http://www.scienceinsocietyadvanced.org/data/files/using-the-internet-to-find-information-296.pdf
Development of the germ theory of disease Activity This activity could be used as a summary at the end of the topic or as a revision exercise. It provides useful summary notes for exam revision when complete. The aim is to provide an overview and to show how the scientists they will have studied in more detail

fit into a general scheme. It will encourage use of the textbook and other resources to find information. http://www.scienceinsocietyadvanced.org/data/files/development-of-germ-theory-of-disease-83.pdf
Website List Web links & other resources Addresses of websites where useful information can be found. http://www.scienceinsocietyadvanced.org/as/topics/the-germ-theory-of-disease-web-links,44,AR.html

Topic 2

Infectious diseases now
Scheme of Work Suggested scheme of work for teaching the topic. http://www.scienceinsocietyadvanced.org/as/topics/infections-diseases-now-scheme-of-work,62,AR.html
Infectious diseases in the news Activity This is an introductory activity which encourages students to begin to use newspapers and magazines to complement their SiS classes. It is intended to be used early on in the course and followed up by more detailed comprehension and critical reading activities later. http://www.scienceinsocietyadvanced.org/data/files/infectious-diseases-in-the-news-28.pdf
Arguments about food poisoning Activity This short activity is one of several designed to help students improve their argument skills. It introduces them to the basic structure of an argument and asks them to analyse and evaluate three arguments used in information about food poisoning. http://www.scienceinsocietyadvanced.org/data/files/1-2-arguments-about-food-poisoning-2-156.pdf
Safer birth in Chad: Maternal mortality today Activity This activity focuses on health problems in Chad, to demonstrate that even when a scientific theory has been strongly supported by evidence and used for many years it will not always be adopted for complex social and economic factors. It introduces a discussion of some reasons for poor health in Low Income Countries today. http://www.scienceinsocietyadvanced.org/data/files/safer-birth-in-chad-30.pdf
Measuring health Activity This activity looks at ways of measuring the health of a population. Students learn how to use scatter graphs to investigate correlations between health indicators and other factors that may affect health. http://www.scienceinsocietyadvanced.org/data/files/measuring-health-19-32.pdf
LSS: Extracting key information from a scientific article at 'first glance' Activity Students learn about the basic structure and style of scientific articles by first testing their own ability to extract key information from such an article. The teacher led part of the activity will help students formalise their approach. It is important to note that the articles used here should be not be research papers, but should be less formal articles which are more accessible. http://www.scienceinsocietyadvanced.org/data/files/extracting-key-information-at-first-glance-317.pdf
Antibiotic role play Activity In this role play students have to explain the uses and limitations of antibiotics in their own words for a popular audience. It provides a good opportunity to clarify their understanding of antibiotics and to practice talking about what they know. It is best done at the end of the topic to reinforce the ideas. http://www.scienceinsocietyadvanced.org/data/files/antibiotic-role-play-34.pdf

LSS: Speed survey Activity
Surveys are an important method of information retrieval, and this activity allows students to evaluate the process of collecting data from short interviews with their peers.
http://www.scienceinsocietyadvanced.org/data/files/speed-survey-319.pdf

HIV discussion statements Activity
These statements are a good way of starting a study of AIDS. They have proved very effective in stimulating interest and discussion. Their use may lead on to a more open discussion and information sharing session in some groups.
http://www.scienceinsocietyadvanced.org/data/files/hiv-discussion-statements-36.pdf

LSS: Let's get critical Activity
We're all used to watching people, especially scientists, present their area of expertise, but what makes a presenter a good one, and would you do it differently? This activity develops the skills of giving and receiving constructive criticism on students' own presentations.
http://www.scienceinsocietyadvanced.org/data/files/lets-get-critical-314.pdf

Cells: animal cells, bacteria and viruses Activity
This activity will revise the structure of an animal cell and the microorganisms that can cause disease. Students colour in labels and structures on a typical animal cell, a bacterial cell and a virus. It will take about 15 minutes.
http://www.scienceinsocietyadvanced.org/data/files/cells-bacteria-and-viruses-16.pdf

LSS: Delving deeper into an article in the 'second glance' Activity
Having completed the activity 'Extracting key information from a scientific article at first glance', students now develop their ability to gain a more detailed sense of the structure and subject matter of an article.
http://www.scienceinsocietyadvanced.org/data/files/delving-deeper-into-an-article-at-second-glance-311.pdf

Spread of infectious diseases Activity
This simple computer model allows students to visualise the spread of an infectious disease and to see how different parameters can affect the rate and extent of the spread. Students can quickly investigate different parameters. Discussion questions link the findings to the real world.
http://www.scienceinsocietyadvanced.org/data/files/spread-of-infectious-diseases-25-39.pdf

Microbe sex/Antibiotic action Activity
In this activity students, working in small groups, will make a movie showing microbe reproduction or antibiotic action. Although many students will have been taught about this topic, being able to make their own models helps understanding and recall of the information.
http://www.scienceinsocietyadvanced.org/data/files/microbe-sex-41.pdf

Visit to the Edward Jenner Museum Activity
The Edward Jenner Museum at Berkeley, Gloucestershire is well worth a class visit if you are in the South West. Students can learn about the history of smallpox, Jenner's work and the disease's final eradication and also about modern understanding of immunology.
http://www.scienceinsocietyadvanced.org/data/files/visit-to-the-edward-jenner-museum-341.pdf

Exam Style Question On HIV Activity
This question reviews some science explanations and the use of statistical indicators in

the context of HIV. It also includes decision making about health care provision. http://www.scienceinsocietyadvanced.org/data/files/exam-style-question-on-hiv-343.pdf
Website List Web links & other resources Addresses of websites where useful information can be found. http://www.scienceinsocietyadvanced.org/as/topics/weblinks-for-infectious-diseases-now,57,AR.html

Topic 3

Transport issues
Scheme of Work Suggested scheme of work for teaching the topic. http://www.scienceinsocietyadvanced.org/as/topics/scheme-of-work-for-transport-issues,65,AR.html
Transport attitudes Activity This short introductory activity encourages students to think about how different groups in society have different transport needs and a diverse range of views on transport policies. http://www.scienceinsocietyadvanced.org/data/files/transport-attitudes-thermometer-70.pdf
LSS: Skim reading a series of articles Activity In this activity, a series of brief articles is presented to the students who complete individual and / or group exercises to explore and develop their approach to reading text. The skills developed in this activity will be useful for the Media watch activity. http://www.scienceinsocietyadvanced.org/data/files/skim-reading-a-series-of-articles-321-2-358.pdf
Media Watch Activity This activity encourages students to investigate how transport issues are portrayed in (mainly) printed media and what these reports show us about how science works. They collect newspaper and magazine articles, adverts and flyers which are concerned with transport issues. http://www.scienceinsocietyadvanced.org/data/files/media-watch-49.pdf
Measurement errors Activity Some ideas for a quick activity to demonstrate the inherent error in any measurement, using thermometers, watches or rulers. It shows how even a simple measurement is subject to both random and systematic error. It should take about 15 minutes. http://www.scienceinsocietyadvanced.org/data/files/measurement-errors-62.pdf
Exam style question Activity This activity is very similar to the sort of questions students will meet in the final exam, though longer. It includes questions on science explanations, on data interpretation and on how science works, reviewing in a new context the causal links ideas met in 1.1 and 1.2. http://www.scienceinsocietyadvanced.org/data/files/exam-style-question-59.pdf
Air pollution and regulation Activity This activity reviews the main evidence used in debates on air pollution regulation. It is one of several written to improve students' argument skills. These skills are important for Unit 2 and for the longer answers in the Unit 1 exam paper. http://www.scienceinsocietyadvanced.org/data/files/air-pollution-53.pdf
Mumbai Activity Air quality is poor in many cities, especially in the less economically developed nations. Now many city authorities are using regulation and new technology to improve the situation. This exercise uses a news item about a policy change in Mumbai (Bombay) as a lead into a discussion about the quality of that decision and the way in which evidence can be used or abused in making a critique of the decision. http://www.scienceinsocietyadvanced.org/data/files/air-quality-mumbai-1-55.pdf

The car of the future - which fuel Activity
This activity encourages students to use their understanding of energy and of some of the factors that are involved in making decisions. They consider the advantages and disadvantages of using biofuels, hydrogen or lithium batteries to replace fossil fuels.
http://www.scienceinsocietyadvanced.org/data/files/car-of-the-future-68.pdf

LSS: Preparing a short presentation Activity
This activity aims to help students develop the skill of acquiring information from presentations and knowledge of how good presentations are structured and presented. Students then do their own presentation, based on one of four articles about alternative fuels, which will reinforce learning about this topic.
http://www.scienceinsocietyadvanced.org/data/files/preparing-a-short-presentation-327-2-360.pdf

Transport trends Activity
In this activity students practice using graphs to obtain information. They consider changes in transport in the UK over the past 25 years, and some possible future trends. They can then select evidence from the data to argue a case either for or against motorway building.
http://www.scienceinsocietyadvanced.org/data/files/transport-trends-106.pdf

LSS: Interpreting graphs Activity
Using a graph to 'tell a story' is a challenging task but provides insights into methods of data collection as well as scientific understanding of phenomena. It can help students to recognise limitations in experimental methods. This activity offers an alternative approach to the same graphs as in the Transport Trends activity.
http://www.scienceinsocietyadvanced.org/data/files/interpreting-graphs-v2-354.pdf

LSS: Processing and representing data Activity
Scientists often have to interpret large amounts of complex data. In order to do so, they need to be able to process the raw data into a form that is easy to understand. In this activity, students are given a set of raw data and are asked to convert it into a data table, then to select an appropriate visual presentation.
http://www.scienceinsocietyadvanced.org/data/files/processing-and-representing-data-326.pdf

Particle collection practical Activity
This activity gives students direct practical experience of some of the issues involved in collecting and analysing data on air pollution. It is designed to be run over two sessions. In the first session students will make their dust collectors and decide where to place them, and in the second session they will collect and analyse their data.
http://www.scienceinsocietyadvanced.org/data/files/particle-collection-practical-104.pdf

Website List Web links & other resources
Addresses of websites where useful information can be found.
http://www.scpub.org/resources/medical-ethics,3,MO,WL.html

Topic 4

Medicines
Scheme of Work Suggested scheme of work for teaching the topic. http://www.scienceinsocietyadvanced.org/as/topics/scheme-of-work-for-medicines,68,AR.html
Ibuprofen? Activity In this short discussion activity students look at a patient information leaflet on Ibuprofen, a widely used painkiller, and discuss answers to questions about it. It is intended as an introduction to the topic of medicines, to raise issues of effectiveness and side effects. The importance of research, to make sure a drug is both effective and adequately safe, is raised. It may also encourage students to make use of such information in their own health care. http://www.scienceinsocietyadvanced.org/data/files/ibuprofen-95.pdf
LSS: Listening to a podcast Activity The advent of the podcast, which can be downloaded onto a computer or portable audio player and listened to at anytime, is revolutionising the way programmes and information are being disseminated. This activity helps students to improve their learning from listening. The technique of note-taking in this activity can be used for any presentation or lecture. Students should be reminded to use it when appropriate. A suggested podcast by Clifford Rosen, from the Maine Center for Osteoporosis, Bangor, US, is available to download from the Royal Society of Chemistry website. http://www.scienceinsocietyadvanced.org/data/files/listening-to-a-podcast-367.pdf
Clinical trials Activity This activity illustrates the need for the different features of a clinical trial, using sets of data. Students consider the importance of control groups, randomisation and blinding and compare two trials with different size samples. http://www.scienceinsocietyadvanced.org/data/files/clinical-trials-97.pdf
LSS: Preparing a longer presentation Activity This activity develops the skills needed to prepare and deliver a formal presentation. The presentations will be delivered and evaluated as part of the activity 'Evaluating presentations'. http://www.scienceinsocietyadvanced.org/data/files/preparing-a-longer-presentation-369.pdf
Home remedies Activity From the first time we fall over and our parent 'kisses it better' we are exposed to the efficacy of Complementary and Alternative Medicine, CAM. All families have their own home remedies, some of which are widely used, others may be particular to a certain ethnic group or region of the country. A class discussion on what students and their families use at home provides an interesting introduction to CAM. It will take between 15 and 30 minutes. http://www.scienceinsocietyadvanced.org/data/files/home-remedies-98.pdf
Drug development Activity In this activity, students review the stages in the development of a new drug, and check their understanding of the reasons for each stage. http://www.scienceinsocietyadvanced.org/data/files/drug-development-96.pdf
Data from clinical trials Activity This activity has a similar format to many of the AS Science in Society exam questions.

It presents data from clinical trials and tests understanding of many of the ideas in this topic. http://www.scienceinsocietyadvanced.org/data/files/data-from-clinical-trials-94.pdf
LSS: Invite an expert Activity This activity gives students the opportunity to choose, organise and benefit from outside expert speakers. There is an emphasis on treating the speaker courteously. http://www.scienceinsocietyadvanced.org/data/files/invite-an-expert-375.pdf
Website List Web links & other resources Addresses of websites where useful information can be found. http://www.scienceinsocietyadvanced.org/as/topics/weblinks-for-medicines,69,AR.html

Topic 5

Ethical issues in medicine
Scheme of Work Suggested scheme of work for teaching the topic. http://www.scienceinsocietyadvanced.org/as/topics/scheme-of-work-for-ethical-issues-in-medicine,74,AR.html
The set of activities 1- 5 from the **Nuffield Council for Bioethics** provides a good introduction to the use of animals in different kinds of research and to the idea of the three Rs: refinement, reduction and replacement. http://www.nuffieldbioethics.org/go/textonly/aboutus/externalactivitiespage_909.html
LSS: Identifying arguments, opinions and points of view Activity We all encounter the opinions of individuals in reports on scientific developments. This activity gets the students to think about the arguments that different people might make for and against animal experiments. Suitable film clips for this activity can be found on the More4 website. http://www.scienceinsocietyadvanced.org/data/files/indentifying-argurment-opinions-and-points-of-view-377.pdf
LSS: Watching a film Activity This activity guides students through two viewings of a scientific film to help them to focus on specific areas of learning. A suitable film for use with this activity *Animals in research: Make up your own mind* is available on The Physiological Society website. http://www.scienceinsocietyadvanced.org/data/files/watching-a-film-380.pdf
Arguments about using animals Activity This short activity is one of a set written to improve Science in Society students' argument skills. It extends the basic model to encourage them to look for unspoken assumptions that may also need to be evaluated when criticising an argument. http://www.scienceinsocietyadvanced.org/data/files/animals-testing-medicines-162.pdf
Discussing animal ethics Activity This activity encourages students to use two ethical frameworks to justify their own general position on animal testing. It then introduces some specific examples of animal experiments that did involve some suffering` and asks them to apply the same approach in forming an opinion on these research projects. http://www.scienceinsocietyadvanced.org/data/files/discussing-animal-ethics-147.pdf
Activity 6 from the **Nuffield Council for Bioethics** "helps students to become aware of the motives behind the material that pressure groups and other organisations present to the public. Students explore a range of websites with the help of a list of questions in order to come to conclusions." http://www.nuffieldbioethics.org/go/textonly/aboutus/externalactivitiespage_909.html
This **online activity** summarises the important ethical issues in research on human subjects and describes some of the guidelines. http://www.wellcome.ac.uk/Professional-resources/Education-resources/Big-Picture/Drug-development/Student-activity/index.htm
A role play from the **Wellcome Big Picture series**. Three different drugs - tackling obesity, HIV/AIDS and heart disease - have had successful phase II trials but the company can only afford to run expensive phase III trials on one of them. But which one will it be? Review each of the proposals, take part in a debate to discuss the issues involved and vote on the drug in which you think the company should invest.

http://www.wellcome.ac.uk/Professional-resources/Education-resources/Big-Picture/Drug-developm
Clinical trials in developing countries Activity This activity looks at some of the issues raised by conducting clinical trials in developing countries. It allows students to review some of the ethical principles involved and to discuss the difficulties. http://www.scienceinsocietyadvanced.org/data/files/clinical-trials-in-developing-countries-148.pdf
True or False statements about Stem Cells Activity This short activity allows students to check that they understand some of the science behind stem cells and cloning and can distinguish what is possible now from what is hoped for in the future. http://www.scienceinsocietyadvanced.org/data/files/true-or-false-statements-about-stem-cells-150.pdf
LSS: Writing a scientific review article Activity In this activity, students write an article, paying particular attention to the structure, content, language and format used. This activity should be carried out in conjunction with 'Writing an abstract' and 'Compiling a bibliography', with 'Evaluating scientific writing' presenting an opportunity to evaluate the work. http://www.scienceinsocietyadvanced.org/data/files/writing-a-scientific-review-article-382.pdf
LSS: Writing an abstract Activity Students write an abstract for the article completed in 'Writing a scientific review article'. It is recommended that this activity is carried out after the students have completed their final draft of the article. http://www.scienceinsocietyadvanced.org/data/files/writing-an-abstract-384.pdf
LSS: Compiling a bibliography Activity Students learn about the importance of a comprehensive and accurate bibliography, before compiling one of their own for the article they wrote about stem cells. http://www.scienceinsocietyadvanced.org/data/files/compiling-a-bibiliography-386.pdf
LSS: Evaluating scientific writing Activity After completing the article, with abstract and bibliography, the students now learn about assessing their work according to assessment criteria. http://www.scienceinsocietyadvanced.org/data/files/evaluating-scientific-writing-394.pdf
LSS: Resources and audiences Activity Approaches to communication of a particular topic may vary significantly, according to the audience. This activity is about students' ability to receive information about stem cells and cloning. http://www.scienceinsocietyadvanced.org/data/files/resources-and-audiences-399.pdf
How do ethics committees reach decisions on new treatments? A role play from the **Scottish Institute for Biotechnology Education** which gives all the different interest groups a chance to have their say about an experimental stem cell therapy before a decision is made. http://www.biology.ed.ac.uk/public/sibe/documents/The Decision.pdf
LSS: Copycat Activity In this activity students learn what plagiarism is and why it is wrong. http://www.scienceinsocietyadvanced.org/data/files/copycat-401.pdf
Review question on stem cells Activity

An exam style question on stem cells. http://www.scienceinsocietyadvanced.org/data/files/review-question-on-stem-cells-149.pdf
Website List Web links & other resources Addresses of websites where useful information can be found. http://www.scienceinsocietyadvanced.org/as/topics/web-links-for-ethical-issues-in-medicine,106,AR.html

Topic 6

Reproductive choices
Scheme of Work Suggested scheme of work for teaching the topic. http://www.scienceinsocietyadvanced.org/as/topics/scheme-of-work-for-reproductive-choices,75,AR.html
The Gift This is a moving and informative play about an inherited disease and its affect on one family. The DVD has to be purchased. Related activities are available free on the Y-touring web site. http://www.ytouring.org.uk/Media/giftvideo.html
LSS: Appropriate levels of communication In this activity students pick out what makes a science story accessible and learn how to write at an appropriate level for a particular audience. http://www.scienceinsocietyadvanced.org/data/files/appropriate-levels-of-communication-409.pdf
Genes and You This set of short activities related to inherited diseases covers a variety of issues including individual dilemmas to discuss, information on a several inherited conditions and some future implications. They are designed to bring out the science and the ethical implications. http://www.gig.org.uk/genesandyoucontents.htm
Huntington's Disease Activity This activity gives a short review of the inheritance of disease caused by a dominant allele. It asks students to justify their opinions on the use of genetic tests for a late onset disease. http://www.scienceinsocietyadvanced.org/data/files/huntingtons-disease-173.pdf
Antenatal testing Activity This activity will introduce students to some of the issues involved in medical screening during pregnancy using different techniques. Students will also think about false positive and false negative results in relation to such tests, and the possible consequences for prospective parents and society. http://www.scienceinsocietyadvanced.org/data/files/antenatal-testing-165.pdf
Human karyotypes Activity In this activity students learn how a sample from amniocentesis is analysed to detect the presence of chromosomal abnormalities. They carry out a practical matching activity and report on the sex and any abnormalities in the karyotype. The activity complements those on antenatal testing and on genetic counselling. http://www.scienceinsocietyadvanced.org/data/files/human-karyotypes-171.pdf
Using ethical frameworks activity Activity Students are given a statement about pre-natal screening and a set of ethical arguments that challenge or support the statement. They are asked to decide which ethical framework is being used in each argument. http://www.scienceinsocietyadvanced.org/data/files/using-ethical-frameworks-177.pdf

Genetic counselling Activity

In this activity students will first carry out research into sickle cell and beta thalassaemia and will then watch (or read transcripts from) a number of short clips of people talking about their feelings when they were screened for these genetic diseases.

They will then role play a genetic counselling session taking the role of either the pregnant woman/partner, or a genetic counsellor.

The whole activity will take at least 1 lesson (although some of the research could be set for homework in a prior lesson).
http://www.scienceinsocietyadvanced.org/data/files/genetic-counselling-169.pdf

Genetic testing and screening Activity

This activity encourages students to read an article which provides a good overview of the issues involved in genetic testing. It will also teach them useful reading skills, thinking more carefully about the meaning of each section so that they can supply their own headings.
http://www.scienceinsocietyadvanced.org/data/files/genetic-testing-and-screening-181.pdf

Analyse a DNA finger print

This short activity allows students to actually 'read' a set of DNA finger-prints of mother, child and possible father to decide a paternity case.
http://www.pbs.org/wgbh/aso/resources/guide/earthappenact3.html

Designer babies Activity

This activity explores the meanings of the term 'designer baby'. It provides a review of the techniques and the issues associated with the application of genetics to human reproduction. Students align themselves across the room according to their opinion and then justify their position.
http://www.scienceinsocietyadvanced.org/data/files/designer-babies-167.pdf

LSS: Making sense of text: representing it in your own way Activity

Students read a piece of text and then represent it in the way that best helps them to remember it.
http://www.scienceinsocietyadvanced.org/data/files/making-sense-of-text-representing-it-own-way-411.pdf

Debate on sex selection

This formal debate on sex selection of children requires good preparation. It encourages students to use their knowledge to develop a persuasive argument.
http://www.wellcome.ac.uk/Professional-resources/Education-resources/

Review question on cystic fibrosis Activity

This is an exam style question which reviews the genetics of cystic fibrosis, the process of PGD, screening procedures for cystic fibrosis and false positives.
http://www.scienceinsocietyadvanced.org/data/files/review-question-on-cystic-fibrosis-175.pdf

Website List Web links & other resources

Addresses of websites where useful information can be found.
http://www.scienceinsocietyadvanced.org/as/topics/weblinks-for-reproductive-choices,108,AR.html

Topic 7

Radiation: risks and uses
Scheme of Work Suggested scheme of work for teaching the topic. http://www.scienceinsocietyadvanced.org/as/topics/scheme-of-work-for-radiation-risks-and-uses,76,AR.html
What risks do you take? Activity This activity introduces students to balancing risk, and the different ways people think about risks in their everyday lives. It asks them to consider risks they take in their own lives. Then they act out a scripted conversation in a student bar to stimulate further discussion about the choices people make. http://www.scienceinsocietyadvanced.org/data/files/1-7-what-risks-do-you-take-final-225.pdf
LSS: Reading and sharing Activity Students work in pairs to study the topic of radiation from two very different points of view. They then share their viewpoints and make a summary of key concepts in their preferred styles. http://www.scienceinsocietyadvanced.org/data/files/reading-and-sharing-421.pdf
Risk your personal choices Activity This is another short introductory activity on risk in which students are asked to consider their own risk choices and then to reflect in more detail on the factors that affect their risk decisions. http://www.scienceinsocietyadvanced.org/data/files/1-7-risk-your-personal-choices-final-227.pdf
Mobile phone use and the precautionary principle Activity In this activity students will plan a questionnaire about mobile phone use. They will aim to discover whether current government advice has affected phone use amongst their family and friends. It provides an introduction to the precautionary principle. http://www.scienceinsocietyadvanced.org/data/files/1-7-mobile-phones-final-229.pdf
Talking risk Activity Media reports of research often use the term ‘risk’ indiscriminately. In this activity students will look at a 2007 newspaper report of research investigating the link between long-term mobile phone use and brain tumours. They will discuss and answer questions on the difference between relative and absolute risk. http://www.scienceinsocietyadvanced.org/data/files/1-7-talking-risk-final-231.pdf
Mobile phones and cancer? Activity Students examine data from an extensive research project on the risks from mobile phones and consider the research design and what the results show. They discuss whether the results prove the negative “Mobile phones do not cause cancer”. http://www.scienceinsocietyadvanced.org/data/files/1-7-mobile-phones-and-cancer-final-247.pdf

Edible atoms	Activity
This is a short, fun activity which will help students to recall the structure of the atom that they learnt about in GCSE. They will model atoms using a paper plate and 3 different sorts of sweets. At the end, when they have correctly demonstrated their understanding of atoms and isotopes, you may wish to let them eat their model! http://www.scienceinsocietyadvanced.org/data/files/1-7-edible-atoms-final-233.pdf	
Radioactivity Units	Activity
This is a short activity to explain the differences between the units commonly used for measuring radioactivity, becquerels, grays and sieverts. http://www.scienceinsocietyadvanced.org/data/files/1-7-radioactivity-units-final-249.pdf	
Radioactive dice	Activity
Students often find understanding half-life difficult. This activity is designed to help them visualise the random nature of radioactive decay, and provides a way of producing a half-life graph from which calculations can be made. The activity uses pennies and dice to represent radioactive isotopes with different half-lives. http://www.scienceinsocietyadvanced.org/data/files/1-7-radioactive-dice-final-235.pdf	
Estimating your radiation dose	Activity
This activity should help students develop a clearer understanding of the different sources of radiation to which they are exposed and an appreciation of their relative magnitude. They use information on radon, nuclear power installations, flying and other sources to estimate their own annual dose. http://www.scienceinsocietyadvanced.org/data/files/1-7-estimating-radiation-dose-final-241.pdf	
Uses of radioactivity	Activity
This activity encourages students to use some important concepts In the science of radioactivity to choose which isotope is best suited for different applications in medicine and the environment. http://www.scienceinsocietyadvanced.org/data/files/1-7-uses-of-radioactivity-final-240.pdf	
LSS: Writing a summary	Activity
In this activity, students summarise information from three different sources on the topic 'Is the use of radiation in medicine justified?' http://www.scienceinsocietyadvanced.org/data/files/writing-a-summary-423.pdf	
Managing radiation doses	Activity
This activity encourages students to consider the principles of radiation protection and how they might apply in the nuclear industry and in medicine. They discuss and answer a set of questions based on exposure data. http://www.scienceinsocietyadvanced.org/data/files/1-7-managing-radiation-doses-final-250-345.pdf	
Radioactive pigeons	Activity
This activity is based on two reports of an unexpected source of contamination at Sellafield. Students have to answer questions to test their understanding of radioactivity. They then compare the style and content of the two reports and write a newspaper article on the issue. http://www.scienceinsocietyadvanced.org/data/files/1-7-radioactive-pigeons-final-253-1-255.pdf	

Making decisions about using radiation	Activity
This is an exam style activity to help students draw together what they have learnt about radiation and risk, and to use their knowledge to help them make decisions about radiation. http://www.scienceinsocietyadvanced.org/data/files/1-7-decisions-about-using-radiation-final-243.pdf	
LSS: Using visuals krypton factor style	Activity
Imagine a world with no visuals. How much time do we waste by using words instead of pictures? In this activity students take turns to describe a visual about radiation. Can their peers recreate the same visual just by listening to the description? http://www.scienceinsocietyadvanced.org/data/files/using-visuals-krypton-factor-style-427.pdf	
Website List	Web links & other resources
Addresses of websites where useful information can be found. http://www.scienceinsocietyadvanced.org/as/topics/web-links-for-radiation-risks-and-uses,126,AR.html	

Topic 8

Lifestyle and health	
Scheme of Work Suggested scheme of work for teaching the topic. http://www.scienceinsocietyadvanced.org/as/topics/scheme-of-work-for-lifestyle-and-health,77,AR.html	
LSS: A case study of DCA Students consider the drug DCA and the claim that it is a cheap and safe drug that kills most cancers. Using an article produced by Cancer Research UK, they consider how informative the article is and generate further questions that might enhance their understanding of DCA and its implications for the cancer drug industry. http://www.scienceinsocietyadvanced.org/data/files/a-study-of-dca-432.pdf	Activity
LSS: Preparing a scientific poster Students create their own poster on the topic of cancer and risk factors. They will improve their ability to summarise information in a range of forms, and will think about how they can communicate scientific ideas using a poster as a cue. http://www.scienceinsocietyadvanced.org/data/files/preparing-a-scientific-poster-434.pdf	Activity
LSS: Evaluating scientific posters Students work in pairs to assess their posters and discuss presenting it verbally. The students swap with another pair to carry out evaluation of the presentation. This is followed by a class discussion on the outcomes. http://www.scienceinsocietyadvanced.org/data/files/evaluating-scientific-posters-437.pdf	Activity
CHD risk game This activity is a board game. It introduces the various factors that increase or decrease the risk of coronary heart disease. http://www.scienceinsocietyadvanced.org/data/files/chd-risk-game-262.pdf	Activity
LSS: Processing large data sets A lot of research relies on collecting lots of data and then looking for trends in the data. In this activity students will have the chance to choose results within the large datasets to focus on, and find out if there are any links between the data. http://www.scienceinsocietyadvanced.org/data/files/processing-large-data-sets-439.pdf	Activity
Why treat people…? This activity asks students to consider some of the wider social factors affecting health in the context of the WHO publication *Closing the gap in a generation*. They will be asked to rank factors and to justify their decision. This should provide a good opportunity for debate. http://www.scienceinsocietyadvanced.org/data/files/why-treat-people-265.pdf	Activity
Alcohol This activity involves some quick multichoice questions on alcohol and then a data analysis question on relative and absolute risks. http://www.scienceinsocietyadvanced.org/data/files/alcohol-268.pdf	Activity
Health Education – bicycle safety The government regularly runs public health education campaigns. For example, '5-a-day', 'Know your units', and 'Go smokefree'. Not all are effective. In this activity, students look at research into the effectiveness of a 'Bike Ed' programme in Australia. They then discuss the outcomes of other campaigns. http://www.scienceinsocietyadvanced.org/data/files/health-education-bicycle-safety-270.pdf	Activity

Plastic bottles and cancer	Activity
This activity looks at two cancer scares relating to plastic bottles, one an 'urban myth' and one where the evidence is still disputed by scientists. Students have to consider conflicting evidence and explain their conclusions. http://www.scienceinsocietyadvanced.org/data/files/plastic-bottles-and-cancer-272.pdf	
LSS: Arranging a scientific report	Activity
In this activity, students identify the structure of scientific studies and compare these with a standard written scientific report (scientific studies are carried out routinely in the food industry and in materials testing). http://www.scienceinsocietyadvanced.org/data/files/arranging-a-scientific-report-441.pdf	
The Worried Well – health testing	Activity
Students are asked to consider the use of health testing kits and the significance of results. They discuss how false positives and negatives arise and the effects they may have. http://www.scienceinsocietyadvanced.org/data/files/the-worried-well-health-testing-274.pdf	
Alcohol – whose responsibility?	Activity
This activity encourages students to decide on what measures they believe are appropriate for the regulation of alcohol consumption and to present these views as an argument. It uses ideas from the Nuffield Council on Bioethics report: Public health - ethical issues. http://www.scienceinsocietyadvanced.org/data/files/alchohol-whose-responsibility-287.pdf	
Health in the News	Activity
In this activity students will make use of a website which provides commentaries on health research as reported in the mainstream media. Students will be able to consider what type of research is reported, and how the stories are simplified for the media. This activity provides a good opportunity to look at an original research paper. http://www.scienceinsocietyadvanced.org/data/files/health-in-the-news-277.pdf	
Fruit and vegetables and cancer	Activity
This activity reviews the advantages and disadvantages of case control and cohort studies, in the context of research on the link between fruit and vegetable consumption and cancer risk. It includes data analysis on results from such research. http://www.scienceinsocietyadvanced.org/data/files/fruit-and-vegetables-and-cancer-280.pdf	
Genes or lifestyle? exam style question	Activity
This question looks at the evidence for genetic risk factors for a major cause of blindness, and then at the influence of two lifestyle factors and how these interact with the genetic risks. Finally students have to translate the information into a health education message. http://www.scienceinsocietyadvanced.org/data/files/genes-or-lifestyle-exam-style-question-282.pdf	
Website List	Web links & other resources
Addresses of websites where useful information can be found. http://www.scienceinsocietyadvanced.org/as/topics/web-links-for-lifestyle-and-health,128,AR.html	

Topic 9

Evolution
Scheme of Work Suggested scheme of work for teaching the topic. http://www.scienceinsocietyadvanced.org/as/topics/scheme-of-work-for-evolution,78,AR.html
Creation myths Activity Students see a power point presentation with creation myths from several different cultures and then discuss whether they have continuing influence and how these explanations of life compare to scientific explanations. http://www.scienceinsocietyadvanced.org/data/files/creation-myths-474.pdf
So much diversity .. can it be explained? Activity Explaining how all the diverse forms of life on earth arose is at the heart of the "evolution debate". This activity introduces Lamarck's more scientific attempt at an explanation. http://www.scienceinsocietyadvanced.org/data/files/so-much-diversity-can-it-be-explained-473.pdf
Evolution cards Activity This is a simple activity to match cards but it serves as a good review of the main features of the theory. http://www.scienceinsocietyadvanced.org/data/files/evolution-cards-476.pdf
LSS: Writing scientific articles for different audiences Activity Students revisit the skill scientific writing, this time with a focus on writing for a more general audience. This is akin to the sort of writing found in newspapers, magazines and some web sites. http://www.scienceinsocietyadvanced.org/data/files/writing-scientific-articles-for-different-audiences-445.pdf
Darwin's finches Activity This activity asks students to interpret a story about the Galapagos finches in terms of evolution as practice in applying the theory. http://www.scienceinsocietyadvanced.org/data/files/darwins-finches-469.pdf
One good theory to another Activity This activity encourages students to put Darwin's ideas in context, by considering some of the other changes in scientific thinking that were happening at the time. They construct a time-line of significant developments. http://www.scienceinsocietyadvanced.org/data/files/one-good-theory-to-another-471.pdf
It's all in the bones – evidence for evolution Activity Students look at diagrams of mammalian limbs and consider the similarities and the adaptations shown. They then discuss how this provides evidence for evolution. http://www.scienceinsocietyadvanced.org/data/files/its-all-in-the-bones-evidence-for-evolution-475.pdf
Genetics of sickle cell anaemia Activity This activity is based on reading an article explaining the genetics and role of natural selection in the disease. Several activities are included on the student sheet to focus their engagement with the text. http://www.scienceinsocietyadvanced.org/data/files/genetics-of-sickle-cell-anaemia-470.pdf
Sickle cell disease and selection - a simulation Activity In this activity, students simulate natural selection of the sickle cell alleles, using beans

and a flipped coin. They should find that the sickle cell allele rapidly becomes more common where there is a high incidence of malarial infection giving an example of natural selection in practice.
http://www.scienceinsocietyadvanced.org/data/files/sickle-cell-disease-selection-472.pdf

Evolution and creation Activity
This activity helps to frame the way students think about the world, and also helps to understand and respect different ways of addressing questions. It is important to be able to categorise frameworks for addressing questions about the universe. If students can do this, it is more likely they will be able to avoid bringing in religious or other unscientific arguments in the place of genuine science.
http://www.scienceinsocietyadvanced.org/data/files/evolution-and-creation-460-467.pdf

Website List Web links & other resources
Addresses of websites where useful information can be found.
http://www.scienceinsocietyadvanced.org/as/topics/web-links-for-evolution,137,AR.html

Topic 10

The Universe
Scheme of Work Suggested scheme of work for teaching the topic. http://www.scienceinsocietyadvanced.org/as/topics/scheme-of-work-for-the-universe,122,AR.html
So you think the Earth is round? Activity A quick look at the evidence for a flat Earth and a round Earth to introduce: theory, predictions from the theory and the observations used to falsify or support a theory. http://www.scienceinsocietyadvanced.org/data/files/so-you-think-the-earth-is-round-215.pdf
Stars, wanderers and the cycles of life PowerPoint slides A set of 7 powerpoint slides showing beautiful images of the solar system with discussion points suggesting the important influences it exerts on our lives. http://www.scienceinsocietyadvanced.org/as/topics/activities-for-the-universe,123,AR.html
People of influence Activity Students research and report on the roles of some key figures, following a trail from early Greeks through the Arabic world during the European dark ages to the world-changing contribution of Copernicus. They learn how to redraft their reports in the light of comments. http://www.scienceinsocietyadvanced.org/data/files/stars-and-wanderers-216.pdf
LSS: Presenting a review using Photostory Activity Photo-movies are a powerful means for students to create presentations. In this activity students create a brief presentation on ancient explanations about the universe, and discuss the value of presenting as a way of learning. http://www.scienceinsocietyadvanced.org/data/files/presenting-a-review-using-phot-story-447.pdf
LSS: Evaluating presentations Activity Having done the preparation, students deliver their presentations to a group of their peers as part of a guided evaluation exercise. This activity encourages students to think about the process of giving feedback when they are evaluating other students' presentations. http://www.scienceinsocietyadvanced.org/data/files/evaluating-presentations-371.pdf
Imperfect heavens PowerPoint slides A set of powerpoint slides showing images of the Moon, Sun and Venus as an introduction to the importance of Galileo's work. http://www.scienceinsocietyadvanced.org/as/topics/activities-for-the-universe,123,AR.html
So you think the Earth goes round the Sun? Activity The activity looks at key evidence from observation of the phases of Venus, with a final part that has a similar structure to that of 'So, you think the Earth is round'. It again deals with the nature of theory, prediction and observation, providing a revisit to these sophisticated ideas. http://www.scienceinsocietyadvanced.org/data/files/stars-and-wanderers-216.pdf
The truth game Activity The activity deals with the key words that are necessary for an understanding of how science works. Students assign examples from this topic to six different categories, such as observation, law or theory.

http://www.scienceinsocietyadvanced.org/data/files/the-truth-game-222.pdf

Giants Activity

Students have already looked at the contributions of Copernicus and Galileo, but it could be argued that it was Kepler's contribution that completed the triumph of the heliocentric view, and it was only this that made the Copernican revolution a lasting one that would influence Isaac Newton and others so strongly. In this activity students compare these 'giants.

http://www.scienceinsocietyadvanced.org/data/files/giants-207.pdf

Science predicts – it's what it's good at Activity

The discovery of Neptune, like other discoveries that have disputed credit, makes a good 'human interest' story that also deals with the science. In this activity students have to imagine the different arguments used by two scientists to explain the movement of Uranus, before Neptune was discovered. They then go on to explore disputed credit in another case of their choice.

http://www.scienceinsocietyadvanced.org/data/files/science-predicts-its-what-its-good-at-212.pdf

The changing solar system Activity

Our understanding of the solar system is still changing. This is an activity that encourages students to research some of this new information and extract a few key points in the way that a journalist does.

http://www.scienceinsocietyadvanced.org/data/files/the-changing-solar-system-217.pdf

Hubble – the biggest pictures ever Activity

This activity takes advantage of the wondrous collection of images on the NASA Hubble Gallery website, and asks students to sort objects according to distance to prepare a display.

http://www.scienceinsocietyadvanced.org/data/files/hubble-209.pdf

How far away Activity

This is a two part activity. The first part is a practical activity looking at the use of parallax to determine distance. The second part uses the 'Powers of Ten' resources to introduce the almost impossible task of imagining the very large numbers involved. There is then an exercise using standard form to express the sizes of different objects in the Universe.

http://www.scienceinsocietyadvanced.org/data/files/how-far-away-208.pdf

Sharing the Universe Activity

The textbook provides a concise account of the key points in the development of the idea that our Galaxy is not the entire Universe. There is a lot for students to learn and digest. This study skills activity provides every student with a record of key information, but avoids their having to work alone through all of the relevant textbook pages.

http://www.scienceinsocietyadvanced.org/data/files/sharing-the-universe-213.pdf

The origin of the Universe Activity

This activity is in two parts. In the first students look at some predictions made by the Big Bang theory and use the textbook and internet to see whether observations match these predictions. In the second they consider the basic ideas of the Big Bang through a partly scripted dialogue that is modelled on Galileo's dialogues, but transposed to modern setting.

http://www.scienceinsocietyadvanced.org/data/files/the-origin-of-the-universe-219.pdf

Questions, questions Activity

Thinking about the Universe raises many questions, some are or will one day be

answerable by science, some not. In the first part of this activity students discuss these questions, in the second part they use the PEEP resources to think about 'space, the Universe and religion' and review some of their knowledge about the Universe. http://www.scienceinsocietyadvanced.org/data/files/questions-questions-210.pdf
Review Activity A collective activity to produce revision materials for the topic. http://www.scienceinsocietyadvanced.org/data/files/review-211.pdf

Topic 11

Scheme of Work Suggested scheme of work for teaching the topic. http://www.scienceinsocietyadvanced.org/as/topics/scheme-of-work-for-are-we-alone,132,AR.html
Cosmic habitats Activity The activity provides an introduction to 'extraterrestrials' by considering their many and varied forms in fiction and their possible forms, if they exist, in reality. To do so it uses the idea of adaptation, comparing human adaptations to those of extremophiles, and then speculating on alien adaptations to unknown conditions on exoplanets. http://www.scienceinsocietyadvanced.org/data/files/cosmic-habitats-335.pdf
How could they tell? Activity The activities here are about evidence for the existence of life and some of the difficulties in detection. Students can attempt to make an estimation of the number of life-supporting planets that might exist using a simplified Drake equation. They also consider two different examples of research into the possibility of life elsewhere – The SETI Institute and the ESA Darwin Project. http://www.scienceinsocietyadvanced.org/data/files/how-could-they-tell-349.pdf
LSS: Evaluating articles about the Universe Activity Students who understand how their work is assessed are at an advantage. In this activity, students examine assessment criteria, and evaluate three Catalyst articles. http://www.scienceinsocietyadvanced.org/data/files/evaluate-articles-about-the-universe-453.pdf
Science and non-science Activity This activity considers the difference between scientific and non-scientific ideas, in the context of the origins of life. The ideas include the hypothesis that life did not originate on Earth. As such it highlights the significance of any future discovery of life elsewhere, and hence the profound cultural importance of 'SETI' projects. It is, of course, an area of sensitivity, and the activity does not set out to do anything other than to explore the distinction between scientific ideas and ideas provided by written authority. http://www.scienceinsocietyadvanced.org/data/files/science-and-non-science-337.pdf
Breaking News Activity This activity provides an opportunity to look at some newspapers and at how they report science-based issues. It also suggests that discovery of new forms of life would be big news. http://www.scienceinsocietyadvanced.org/data/files/breaking-news-339.pdf
Website List Web links & other resources Addresses of websites where useful information can be found. http://www.scienceinsocietyadvanced.org/as/topics/weblinks-for-are-we-alone,131,AR.html