

Teacher Resource Bank

GCE Science in Society

Coursework Guidance



Unit 2 SCIS2 – Reading and Writing about Science

Critical Account of Scientific Reading

Book choice

The purpose of the internally assessed work in the Science in Society course is to encourage individual exploration of additional science and scientific issues that are of personal interest and relevance. In doing so, candidates build upon the approach to contexts introduced in Unit 1 SCIS1 AS Exploring Key Scientific Issues. Candidates are expected to interweave, within the context of their chosen reading, three strands: the issue, the science behind the issue and what a study of the issue tells us about science and society.

The overall context for this work is reading popular science. Candidates are encouraged to discover the pleasure of such reading while developing the necessary skills to reflect and report on their experience.

Candidates are free to choose their reading — non-fiction or ‘hard’ science fiction — but it should be related to some aspect of the overall content of this specification, especially the ideas about *How Science Works* (Section 3.5) and/or the science explanations (Section 3.6).

The reading must provide an opportunity for candidates to show through their accounts that they are able to:

- read, analyse and communicate accurately and effectively their understanding of the main scientific content;
- critically discuss the style and language used in the text, including its effectiveness for purpose.

In guiding candidates through their work in this element of the course much advice about task setting, pacing of the work, supervision and discussion of drafts through to final assessment is common to the write-up of the Study of a topical scientific issue and thus provided elsewhere. Resources that include preparative assignments for both pieces of internally assessed work are available through the associated Nuffield Curriculum Development Centre resources project (www.scienceinsocietyadvanced.org). There is good general advice to students on the internally assessed work in ‘Chapter 12: Reading and writing about science’ of the associated textbook (*AS Science in Society*, Andrew Hunt Ed., Heinemann, 2008). Detailed advice on assessment and supervision is provided at standardising meetings. What follows concentrates upon the first, and arguably most important, part of the process — the choice of reading.

It is important to stress the aim of sustaining and developing candidate’s interest in, and engagement with, science. Discovery of the pleasure of reading popular science writing is an important contribution as long as the choice for the student is a pleasure rather than a chore.

It is expected that candidates will choose both their scientific reading material and topical scientific issue in consultation with their teachers. The account and report are part of teaching and learning rather than being solely for assessment purposes, and it is envisaged that teachers will guide and supervise candidates at all stages as work proceeds.

If you are introducing this task for the first time, or are under resource restraints (time, money, etc) you may feel that what you want to do is to copy a list and ask students to choose from it so that you can source it through your librarian or as a minimal purchase. If that is your position there are lists here that you can use in that way, but do recognise that there is **not** a recommended list of reading supplied by AQA or the associated Nuffield Curriculum Centre project. And nor will there be one in the future: an eminently suitable book for one candidate in one centre may not be suitable for another elsewhere — for example, the account produced by an ‘average’ candidate on certain reading listed in this booklet might display insufficient scientific understanding stemming from inability to understand the text in the first place. That same ‘average’ candidate would fare much better in grappling with a more accessible, yet still adult, book.

You will need to consider carefully with each student individual factors that will affect their ability to access the content and hence provide an explanation, in their own words, of the science rather than just a list of the book’s content. Factors will include the students’ ability, their other studies, their personal interest and the

nature of the science content in relation to the science ideas and explanations in the specification. Some books are more accessible than others – not all great scientists are great writers. The specification requires that the reading should consist ‘at least 15,000 words (perhaps 40–50 pages of a typical paperback)’ and indicates that this might be met in a number of ways. While other forms are possible, the vast majority of successful candidates will base their work on (a substantial section from) a book. Your guidance should be towards substantial popular texts – the requirements are **not** met by course textbooks, web pages or films.

In setting the task you will need to consider how you are to allow the choice once you have outlined the requirements. One experienced teacher has written:

“I think the aim of encouraging reading about science is best met if students have some choice and are led to where that choice is in the real world so that they might in future do it for themselves. I have not bought books ahead of time. I take them to [a well-known chain bookshop], park them in the ‘general science’ section, and ask them to choose (preferably paperback under £15, etc). Recently I’ve organised an account through the school librarian and then bought them immediately — which the students respond well to — but previously I noted titles and then ordered through Amazon. In the first year I did similar but in the library (before I’d got a budget sorted out). Public library not school library. The point is that they should be looking at stuff aimed at the ‘general public’. So if you really do need to buy ahead of time I’d do similar on your own. Go and see what is out on the table at the bookshop, what is being sold now and pick up a mixture of story/history, current work and ‘fun’.”

If you are unable to accompany students to a bookshop, you may want to provide a list of your recommendations. This might be for student choice from the centre library (as a precursor to which you might want to supply your librarian with a buying list), a local library, or a high-street or online bookshop.

In preparing such a list you will want to bear in mind the requirements of the specification, and also the experience of previous candidates. You will find it useful to refer to Reports on the Examinations for the predecessor specification, AS Science for Public Understanding, available on the AQA web site. For example:

Extracted from Report on the Examination 2004

An increasing range of sources for this work is becoming available with ‘popular science’ a growth area in publishing. This provides for appropriate choice in the circumstances of individual centres and candidates, and for a pleasing variety of reading for the moderators. The majority of better pieces of work seen are reviews of a full-length ‘popular science’ book based on the detailed reading of a few chapters. We saw less science fiction or magazine articles than in previous years and the overall standard is the better for this change.

Extracted from Report on the Examination 2003

It bears repetition that it is hard for any but the best candidates to access reasonable marks using science fiction. ‘Science fiction’ is a wide and inclusive genre. Some is readily accessible but the basis of teacher guidance on a choice in this vein should be that a fair proportion of the science is real, (*Buffy the Vampire Slayer* for example is not appropriate) and that the student is capable of distinguishing where the real science ends and the fiction begins. The majority of the better pieces of work seen are reviews of a full-length ‘popular science’ book based on the detailed reading of a few chapters. A few centres needed reminding that science course textbooks are not an appropriate choice of reading.

Extracted from Report on the Examination 2002

In the *Account of Reading* a pleasing variety of interesting sources were used. However, too many candidates failed to give accurate and complete reference to the material upon which the work was based as required by the specification. Many candidates produced excellent reports that were a joy to read. Some were hampered by choice of material. Science fiction, especially that variety which contains a lot of fiction and not much

science, provided a relatively poor basis for this piece of work, especially for less able candidates, although the task had clearly been an enjoyable one. Candidates who otherwise gained all the available marks had commonly missed the opportunity to set their reading in a wider context.

These extracts are clearly suggesting that your candidates may be better off choosing a book (rather than a series of articles) and non-fiction rather than fiction. But this will not be true for every candidate and you are in the best place to judge the abilities of your students, their interests — and indeed your own interests in guiding them through the work. An experienced teacher has written:

“It is undoubtedly true that I have had students successfully write accounts of their reading of science fiction, for example, and of pretty hard-going science books. But not all my students could have done so. In particular I steer my weaker students away from science fiction (they think it’s going to be easy but it’s not). They are not able enough to distinguish the boundary between the science and the fiction which is necessary to gain marks for science explanation. Insistent ones I point to books with titles like *Science of Star Trek*, *Science of Discworld*, etc. Or they might be attracted by books that are presented more ‘imaginatively’ like *Dr Titania*.”

Bear in mind the abilities and interests of your students. They need to be able to access the reading. Some less able students might be steered toward work written for (younger) teenagers on which they can make appropriate comment on suitability. Do not exclude from consideration a ‘hard’ read that would be stretching and academically exciting to the more able student, but equally do not encourage your less able students to attempt reading that they will not, despite much effort, understand.

The following pages suggest ways in which, or provide bases from which, you might prepare a suitable list for your work with your students. You should make it clear in presenting this task to your students that simply choosing a book from any given list does not guarantee high marks.

Royal Institution Salon for Science Library

Most librarians will be happy to supply you with a list of appropriate books in their stock. This might be your centre library, a local public library, or a specialist library at a local academic institution. As an example, the following list is of books published since 1999 and held in the Royal Institution 'Salon for Science' library created in 2000. At the time of writing, the Royal Institution is moving its library back into a newly refurbished building after a two year closure — this list has not yet been updated but is nonetheless a helpful indication of the range and type of reading available. The Royal Institution has been involved in encouraging the public understanding of science for over two hundred years with a membership of both scientists and interested non-scientists. Their public lecture programme, which includes events sponsored by publishers to present new 'popular science' books, is a useful resource for teachers of Science in Society.

Aleksander, Igor	<i>How to Build a Mind</i>	Weidenfeld and Nicholson, 2000
Bainbridge, David	<i>A Visitor Within - The Science of Pregnancy</i>	Weidenfeld & Nicolson, 2000
Barbour, Julian	<i>The End of Time: The Next Revolution in our Understanding of the Universe</i>	Weidenfeld and Nicholson, 1999
Barondes, Samuel H	<i>Mood Genes: Hunting for the Origins of Mania and Depression</i>	Penguin, 1999
Berry, Adrian	<i>The Giant Leap; Mankind Heads for the Stars</i>	Headline, 1999
Blakemore, Colin & Iverson, Susan	<i>Gender and Society</i>	OUP, 2000
Brockman, John	<i>The Greatest Inventions of the Past 2000 Years</i>	Weidenfeld and Nicholson, 2000
Brockman, John; Matson, Katinka	<i>How Things Are: A Science Tool-Kit for the Mind</i>	Phoenix, 1999
Chaikin, Andrew	<i>A Man on the Moon</i>	Penguin, 1999
Cohen, Jack; Stewart, Ian	<i>The Collapse of Chaos: Discovering Simplicity in a Complex World</i>	Penguin, 2000
Courtillot, Vincent	<i>Evolutionary Catastrophes: The Science of Mass Extinctions</i>	Cambridge University Press, 1999
Damasio, Antonio	<i>The Feeling of What Happens: Body, Emotion and the Making of Consciousness</i>	William Heinemann, 1999
Davies, Paul	<i>The Fifth Miracle: The Search for the Origin of Life</i>	Penguin, 1999
Dawkins, Richard	<i>Unweaving the Rainbow</i>	Penguin, 1999
Delsemme, Armand	<i>Our Cosmic Origins: From the Big Bang to the Emergence of Life and Intelligence</i>	Cambridge University Press, 1999
Devlin, Keith	<i>The Maths Gene: Why Everybody has it, but most people don't use it</i>	Weidenfeld and Nicholson, 2000
Dover, Gabriel	<i>Dear Mr Darwin: Letters on the Evolution of Life and Human Nature</i>	Weidenfeld and Nicholson, 2000
Dyson, Freeman	<i>Origins of Life</i>	Cambridge University Press, 1999
Dyson, George	<i>Darwin among the Machines</i>	Penguin, 1999
Feynman, Richard P	<i>Lectures on Gravitation</i>	Penguin, 1999
Feynman, Richard P	<i>Lectures on Computation</i>	Penguin, 1999
Feynman, Richard P	<i>Six easy pieces: The Fundamentals of Physics Explained</i>	Penguin, 1999
Feynman, Richard P	<i>Six not-so-easy Pieces: Einstein's Relativity, Symmetry and Space-Time</i>	Penguin, 1999

Feynman, Richard P	<i>The Meaning of it All</i>	Penguin, 1999
Frankel, Charles	<i>The End of Dinosaurs: Chicxulub Crater and Mass Extinctions</i>	Cambridge University Press, 2000
Freeman, Walter, J	<i>How Brains Make up their Minds</i>	Weidenfeld and Nicholson, 1999
Gamow, George	<i>Mr Tompkins in Paperback</i>	Cambridge University Press, 2000
Gardner, Martin	<i>Visitors from Oz: The Wild Adventures of Dorothy, the Scarecrow and the Tin Woodman</i>	Penguin, 1999
Glynn, Ian	<i>An Anatomy of Thought</i>	Phoenix, 2000
Gopnik, Alison; Meltzoff, Andrew; Juhl, Patricia	<i>How Babies Think</i>	Weidenfeld and Nicholson, 1999
Greenfield, Susan	<i>The Private Life of the Brain</i>	Penguin, 2000
Greenfield, Susan	<i>Brain Story: Unlocking our Inner World of Emotions, Memories, Ideas and Desires</i>	BBC, 2000
Gribbin, John	<i>The Little Book of Science</i>	Penguin, 1999
Gribbin, John	<i>Almost everyone's Guide to Science</i>	Phoenix, 1999
Gribbin, John	<i>The Birth of Time</i>	Penguin, 1999
Gribbin, John	<i>The Case of the Missing Neutrinos and other curious phenomena of the Universe</i>	Penguin, 2000
Grice, Gordon	<i>The Red Hourglass: Lives of the Predators</i>	Penguin, 1999
Hazen, Robert M	<i>The Diamond Makers: A Compelling Drama of Scientific Discovery</i>	Cambridge University Press, 2000
Hofstadter, Douglas R	<i>Godel, Escher, Bach: an Eternal Golden Braid</i>	Penguin, 2000
Jakosky, Bruce	<i>The Search for Life on Other Planets</i>	Cambridge University Press, 2000
James Lovelock	<i>Homage to Gaia</i>	OUP, 2000
Kirkwood, Tom	<i>Time of Our Lives: Why Ageing is Neither Inevitable</i>	Penguin, 1999
Kitchin, CR	<i>Journeys to the Ends of the Universe</i>	Adam Hilger, 1999
Loewenstein, Werner R	<i>The Touchstone of Life: Molecular Information, Cell Communication and the Foundations of Life</i>	Penguin, 1999
Mark Buchanan	<i>Ubiquity</i>	Weidenfeld & Nicolson, 2000
Mark Ridley	<i>Mendel's Demon</i>	Weidenfeld & Nicolson, 2000
McGowan, Christopher	<i>Diatoms to Dinosaurs: The Size and Scale of Living Things</i>	Penguin, 1999
Narlikar, Jayant V	<i>Seven Wonders of the Cosmos</i>	Cambridge University Press, 1999
Naughton, John	<i>A Brief History of the Future: The Origins of the Internet</i>	Phoenix, 1999
Paulos, John Allen	<i>Once upon a Number: The Hidden Mathematical Logic of Stories</i>	Penguin, 1999
Penrose, Roger; Shimony, Abner; Cartwright, Nancy; Hawking, Stephen	<i>The Large, The Small and the Human Mind</i>	Cambridge University Press, 1999

Pinker, Steven	<i>Word and Rules: The Ingredients of Language</i>	Phoenix, 1999
Potts, Malcolm; Short, Roger	<i>Ever Since Adam and Eve: The Evolution of Human Sexuality</i>	Cambridge University Press, 2000
Rees, Martin	<i>Just Six Numbers: The Deep Forces that Shape the Universe</i>	Phoenix, 1999
Reiss, Michael J; Straughan, Roger	<i>Improving Nature: The Science and Ethics of Genetic Engineering</i>	Cambridge University Press, 2000
Richardson, Ken	<i>The Making of Intelligence</i>	Phoenix, 1999
Rogers, Lesley	<i>Sexing the Brain</i>	Phoenix, 2000
Rose, Steven	<i>From Brains to Consciousness? Essays of the New Sciences of the Mind</i>	Penguin, 1999
Rose, Steven	<i>The Chemistry of Life</i>	Penguin, 1999
Rose, Steven; Rose Hilary	<i>Alas, Poor Darwin: Arguments against Evolutionary Psychology</i>	Jonathan Cape, 2000
Rowntree, Derek	<i>Statistics without Tears</i>	Penguin, 2000
Semir Zeki	<i>Inner Vision - An Exploration of Art and the Brain</i>	Oxford University Press, 1999
Singer, Peter	<i>A Darwinian Left: Politics, Evolution and Cooperation</i>	Weidenfeld and Nicholson, 1999
Stewart, Ian	<i>Life's other Secret: The New Mathematics of the Living World</i>	Penguin, 1999
Tania Farrell Yelland	<i>All Woman - Life After Breast Cancer</i>	Metro Publishing Ltd, 2000
Taquet, Philippe	<i>Dinosaur Impressions: Postcards from a Palaeontologist</i>	Cambridge University Press, 1999
Vogel, Steven	<i>Cats' Paws and Catapults</i>	Penguin, 1999
Wall, Patrick	<i>Pain, the Science of Suffering</i>	Phoenix, 2000
Whalley, Lawrence	<i>The Ageing</i>	Weidenfeld and Nicolson, 2001

Acknowledgement: thanks to Dr Frank James, Reader in the History of Science and Keeper of Collections at the Royal Institution (<http://www.rigb.org>), for providing this list and permission to use it in GCE Science in Society materials.

Royal Society Prizes for Science Books

The Royal Society coordinates the award of two annual science book prizes (<http://royalsociety.org/bookspage>), one to celebrate books written for the general public and one for books written for children.

Ever since the Prizes were originally established in 1988 they have had the same aim - to encourage the writing, publishing and reading of good and accessible popular science books. They have grown to become one of the UK's most prestigious non-fiction literary prizes.

You might assume that the prize winning and shortlisted books will generally be written well enough that they will be accessible to your candidates, but do take care — some titles will stretch even your more able students. These books are very likely to be available as paperbacks or in your local library system. Most of the children's books are too 'young' for Science in Society students but they will occasionally be appropriate for particular candidates.

Here are the judges' comments on their selected long list of twelve books for the Royal Society Prize for Science Books, 2008:

J Craig Venter	<i>A Life Decoded</i> An autobiography with a twist where life is put into the context of what is in your genes. This is a book about a man whom you cannot ignore.	Penguin Allen Lane
John Emsley	<i>Better Looking, Better Living, Better Loving: How Chemistry can Help You Achieve Life's Goals</i> A very practical, informative and interesting read which reveals chemistry as being key to modern life.	Wiley-VCH
Steve Jones	<i>Coral: A pessimist in paradise</i> This book is an idiosyncratic discussion of how zoology, history and ecology meet. It is beautifully written and draws you into it	Little, Brown
Gerd Gigerenzer	<i>Gut Feelings</i> From picking girlfriends to making choices about our health, <i>Gut Feelings</i> explores the role of the unconscious mind in how we make decisions. A book for everyone interested in making better choices.	Penguin-Allen Lane
Mick O'Hare	<i>How to Fossilise Your Hamster</i> A fun book, full of experiments which shows that science can be enjoyed by everyone.	Profile Books
Chris Frith	<i>Making Up The Mind</i> A wonderfully clear introduction to the neuroscience of thinking. The author's personality shines through and he is charmingly entertaining.	Wiley - Blackwell
Mark Lynas	<i>Six Degrees: Our future on a hotter planet</i> A doomsday scenario which everyone has to know about. A thought-provoking read which makes the issues of global warming very real and immediate.	Fourth Estate
Steven Pinker	<i>The Stuff of Thought</i> This book takes a difficult subject and carries you along with it. It introduces us to how language can tell us how the mind works.	Penguin-Allen Lane

Stuart Clark	<i>The Sun Kings</i> A wonderful historical biography. This 19 th century melodrama gets you straight into the science of sun spots. It has everything great characters, knives, guns and illicit relationships.	Princeton University Press
Ian Stewart	<i>Why Beauty is Truth</i> An elegant and beautifully written book on a key mathematical topic which links through to many different subjects.	Basic Books
Lewis Smith	<i>Why the Lion Grew Its Mane</i> Beautifully presented and easy to read it is a book that would be great to receive as a present. It draws the reader into the world of science.	Papadakis
Noah Goldstein, Steve J Martin, & Robert B Cialdini	<i>Yes!</i> A compelling book about why we do the things we do and what effect the art of persuasion has on us.	Profile Books

General prize winners 1996 – 2007

2007 Daniel Gilbert	<i>Stumbling on happiness</i>	Harper Press
2006 David Bodanis	<i>Electric Universe - How Electricity Switched on the Modern World</i>	Little, Brown Book Group
2005 Philip Ball	<i>Critical Mass: One Thing Leads to Another</i>	William Heinemann
2004 Bill Bryson	<i>Short History of Nearly Everything</i>	Doubleday/Transworld
2003 Chris McManus	<i>Right Hand, Left Hand</i>	Weidenfeld & Nicolson
2002 Stephen Hawking	<i>The Universe in a Nutshell</i>	Bantam Press/Transworld Publishers
2001 Robert Kunzig	<i>Mapping the Deep – The Extraordinary Story of Ocean Science</i>	Sort of Books
2000 Brian Greene	<i>The Elegant Universe</i>	Jonathan Cape
1999 Paul Hoffman	<i>The Man who Loved Only Numbers</i>	Fourth Estate
1998 Jared Diamond	<i>Guns, Germs and Steel</i>	Jonathan Cape
1997 Alan Walker & Pat Shipman	<i>The Wisdom of Bones: In Search of Human Origins</i>	Weidenfeld and Nicolson
1996 Arno Karlen	<i>Plague's Progress</i>	Victor Gollancz

Shortlisted general books, 2000 – 2008

J Craig Venter	<i>A life decoded</i>	Penguin Allen Lane, 2008
Steve Jones	<i>Coral: A pessimist in paradise</i>	Little, Brown, 2008
Gerd Gigerenzer	<i>Gut feelings</i>	Penguin-Allen Lane, 2008
Mark Lynas	<i>Six degrees: Our future on a hotter planet</i>	Fourth Estate, 2008
Stuart Clark	<i>The sun kings</i>	Princeton University Press, 2008
Ian Stewart	<i>Why beauty is truth</i>	Basic Books, 2008

Chris Stringer	<i>Homo Britannicus</i>	Penguin Allen Lane, 2007
Eric R Kandel	<i>In Search of Memory</i>	WW Norton & Co, 2007
Henry Nicholls	<i>Lonesome George</i>	Macmillan, 2007
Adam Wishart	<i>One in Three</i>	Profile Books, 2007
Robert Henson	<i>The Rough Guide to Climate Change</i>	Rough Guides, 2007
Jared Diamond	<i>Collapse - How Societies Choose to Fail or Survive</i>	Penguin-Allen Lane, 2007
Michio Kaku	<i>Parallel Worlds - The Science of Alternative Universes and our Future in the Cosmos</i>	Penguin, 2006
Nick Lane	<i>Power, Sex, Suicide - Mitochondria and the Meaning of Life</i>	Oxford University Press, 2006
Arthur I Miller	<i>Empire of the Stars - Friendship, Obsession and Betrayal in the Quest for Black Holes</i>	Little, Brown Book Group, 2006
Vivienne Parry	<i>The Truth About Hormones - What's Going on when we're Tetchy, Spotty, Fearful, Tearful or Just Plain Awful</i>	Atlantic Books, 2006
Richard Dawkins	<i>The Ancestor's Tale</i>	Weidenfeld & Nicholson, 2005
Douwe Draaisma	<i>Why Life Speeds Up As You Get Older</i>	Cambridge University Press, 2005
Griffith Edwards	<i>Matters of Substance: Drugs - and why everyone's a user</i>	Penguin-Allen Lane, 2005
Richard Fortey	<i>The Earth: An Intimate History</i>	HarperCollins, 2005
Robert Winston	<i>The Human Mind</i>	Bantam Press/Transworld Publishers, 2005
Francis Spufford	<i>Backroom Boys</i>	Faber & Faber, 2004
Andrew Brown	<i>In the Beginning was the Worm</i>	Simon & Schuster, 2004
Nigel Calder	<i>Magic Universe</i>	Oxford University Press, 2004
Armand Marie Leroi	<i>Mutants</i>	Penguin: Viking USA, 2004
Matt Ridley	<i>Nature via Nurture</i>	Fourth Estate, 2004
Mark Buchanan	<i>Small World</i>	Weidenfeld & Nicholson, 2003
Gerd Gigerenzer	<i>Reckoning with Risk</i>	Allen Lane, 2003
Robert P Kirshner	<i>The Extravagant Universe</i>	Princeton University Press, 2003
Steve Pinker	<i>The Blank Slate</i>	Allen Lane, 2003
Stephen Webb	<i>Where Is Everybody?</i>	Copernicus Books, 2003
David Horrobin	<i>The Madness of Adam & Eve</i>	Bantam Press/Transworld Publishers, 2002
Martin Gorst	<i>Aeons: The Search for the Beginning of Time</i>	Fourth Estate, 2002
Robert Sapolsky	<i>A Primate's Memoir</i>	Jonathon Cape, 2002
Hannah Holmes	<i>The Secret Life of Dust</i>	John Wiley and Sons, 2002
Michael White	<i>Rivals</i>	Secker & Warburg, 2002

Steve Grand	<i>Creation: Life and How to Make it</i>	Weidenfeld & Nicolson, 2001
Lewis Wolpert	<i>Malignant Sadness – The Anatomy of Depression</i>	Faber, 2001
Mark Ridley	<i>Mendel’s Demon – Gene Justice and the Complexity of Life</i>	Weidenfeld and Nicolson, 2001
Paul Strathern	<i>Mendeleev’s Dream – The Quest for the Elements</i>	Penguin, 2001
George Johnson	<i>Strange Beauty – Murray Gell-Mann and the Revolution in Twentieth Century Physics</i>	Jonathan Cape, 2001
Thomas Dormandy	<i>The White Death</i>	Hambledon Press, 2000
John Naughton	<i>A Brief History of the Future</i>	Weidenfeld and Nicolson, 2000
Matt Ridley	<i>Genome</i>	Fourth Estate, 2000
Robert Weinberg	<i>Time, Love, Memory</i>	Faber & Faber, 2000
Christopher Wills	<i>Children of Prometheus</i>	Allen Lane, 2000

Acknowledgement: we are grateful to the Royal Society Education Programme (<http://www.royalsoc.ac.uk>) for providing the list of books, shortlisted and prize winning, for the Royal Society Book Prize.

Online Bookstore

If you are supplying a list for purchase (e.g. by your centre librarian) it is helpful to check prices and availability. A search in an online bookstore will also allow you to sort results by date of publication (current relevance) or price (budget) and often contain a synopsis or set of reviews that can aid your decisions.

Category searches work differently on different sites. A search of one major online bookstore using the search term 'books: popular science' will, by default, bring up books in this category sorted by current sales popularity and the synopsis included for most books is often sufficient for you to assess their suitability. On another site, it is possible to 'browse' in the 'science' section where by default the most recently published books aimed at the general public appear first in the listings. But another requires more care as browsing in the 'science section' starts with their top selling textbooks — that are not appropriate reading for Science in Society — to the top of the list.

Science Fiction

You may have some candidates who wish to choose fiction, or you might with your particular group of candidates wish to encourage this possibility. If so, the admonition to take care that the science is evident and distinguishable to the candidate is made in the specification by requiring works that can be categorised as 'hard science fiction'.

...as summarised by Allen Steele (in 'Hard again' in 'New York Review of Science Fiction', June 1992): "Hard sf is the form of imaginative literature that uses either established or carefully extrapolated science as its backbone."... it is possible to write a form of hard sf about almost anything. Hard sf should not, however, wilfully ignore or break down known scientific principles...while a rigorous definition of "hard sf" may be impossible, perhaps the most important thing about it is, not that it should include real science in any great detail, but that it should respect the scientific spirit; it should seek to provide natural rather than supernatural or transcendental explanations for the events and phenomena it describes

John Clute & Peter Nicholls, *The Encyclopaedia of Science Fiction*, Orbit 1999

An experienced teacher has found the following web-site a useful source:

HardSF: Looking for the science in fiction (<http://hardsf.org>)

It includes some useful booklists and discussion of fiction based around various scientific topics.

A science examiner with a particular interest in science fiction offers these comments:

"A seemingly straightforward request for suggested reading to someone as well acquainted with science fiction as myself is, in fact, quite difficult to respond to. Pretty well all science fiction of any literary worth uses one, or more, science fiction scenarios to provide the context within which to explore aspects of inter-personal relationships and social/economic/political structures. So although faster-than-light travel or communication, for example, might be used to give the chosen context some plausibility, such physical science 'fictions' are incidentally rather than focally relevant to the main thrust of the fictional work. Similarly, details of the species native to other planets and of the ecosystems they comprise, or of the ecosystem set up within a spacecraft on a long inter-stellar journey, are not usually important in their own right but rather to provide verisimilitude in the backdrop to what a novel or short story is primarily concerned with exploring. Consequently, any worthwhile evaluation of a piece of science fiction would be mainly concerned with the following two (not entirely independent) features of the work: its literary qualities and the quality of the insight it provides into the predicament of sapient beings. Insofar as the latter quality relates to science at all it relates to the 'soft' sciences of psychology, sociology etc. which may be out with the experience of the great majority of candidates or their teachers.

The obvious implication is that allowing students to review a science fiction text is not necessarily such an excellent idea, rich in possibilities, as it might at first appear to be. Nor is it surprising that students often select inappropriate science fiction texts. It would, however, be hasty to conclude that the possibility of using science fiction be altogether avoided. There are a few aspects of science fiction that provide enough purchase for legitimate assessment:

- some science fiction works describe the ecosystems of other planets and/or of a closed biosphere (e.g. in a spacecraft or in a lunar/Martian base) not just as incidental background but in a more developed way as something to be savoured by readers (much as in a mainstream novel the atmosphere of a particular city or country might be portrayed/evoked); [e.g. *the whole of Kim Stanley Robinson's Mars trilogy and, so far as a spacecraft is concerned, the early part of Red Mars*]

- some science fiction works explore the implications of bio-engineering (e.g. the cloning of, or the selective/engineered breeding of, or the use of new therapies with, human beings) and hence address the unforeseen consequences and the ethical implications of scientific applications; [e.g. *Daniel Keyes' Flowers for Algernon* or *Nancy Kress' Beggars in Spain and its sequels.*]
- some science fiction works, whatever else they might do, also provide insight into the activity of science and the goings-on within the scientific community;
- a very few science fiction works explore, more than incidentally, some aspect of physical science. Those that do are usually in short story format. [Examples include *Robert Forward's novel Dragon's Egg that envisages sentient life-forms on a hyper-dense neutron star* and a short story called *The Xi Effect in which the world progressively shrinks to below the size of increasingly shorter wavelengths of radiation.*]
- there are interesting works that explore the question of how, via remote signals and/or face-to-'face' contact, communication with alien sapiens is portrayed. [There is an excellent appraisal of this in *Evolving the Alien* by *Ian Stewart and Jack Cohen.*]"

Drama and poetry

Certain students may find particular interest in more unusual types of reading. For example, students whose other courses or interests are in language or the performing arts might be interested in plays or poetry. There are other students for whom (explanatory) dialogue might be more readily accessible. Like science fiction the problem can be finding reading with sufficient clearly scientific content. Care also needs to be taken that what is reviewed for the actual account of reading is just that — reading — not a live performance or DVD.

The following have been suggested by one centre that has taken this approach:

Drama

Djerassi, Carl	<i>An Immaculate Misconception</i>	ICP
Djerassi, Carl/Hoffman, Roald	<i>Oxygen</i>	Wiley
Frayn, Michael	<i>Copenhagen</i>	Methuen
Poliakoff, Stephen	<i>Blinded by the Sun</i>	Methuen
Whittell, Crispin	<i>Darwin in Malibu</i>	Methuen
Djerassi, Carl/Pinner, David	<i>Newton's Darkness: Two Dramatic Views</i>	SciPub

Poetry

Maurice Riordan & Jocelyn Bell Burnell (Eds)	<i>Dark Matter: Poems of Space</i>	Gulbenkian
Maurice Riordan & Jon Turney (Eds)	<i>A Quark for Mister Mark: 101 Poems About Science</i>	Faber
John Burnside & Maurice Riordan (Eds)	<i>Wild Reckoning: An Anthology Provoked by Rachel Carson's "Silent Spring"</i>	Gulbenkian
Lavinia Greenlaw (Ed)	<i>Signs and Humours: The Poetry of Medicine</i>	Gulbenkian

Essays/selections

Some teachers have found it useful to have a group of students reading the same book so that more depth can be reached in class discussion. If this is done it is essential that a process is set up from the start to ensure that the work presented in the final account is the work of the individual candidate (e.g. teacher notes of class discussion are taken and referred to on the Centre Declaration Sheet and Candidate Record Form). One method that has been used in some centres is to have students review different chapters or sections of a book. They have different tasks of explanation but can enhance through class discussion their understanding of its context in the whole work. The following have been suggested as suitable for use in this way:

Bragg, Melvyn	<i>On Giants' Shoulders</i>	Hodder & Stoughton
Bryson, Bill	<i>A Short History of Nearly Everything</i>	Doubleday
Collins, Harry Pinch, Trevor	<i>The Golem</i>	Canto
Dawkins, Richard	<i>A Devil's Chaplain</i>	Weidenfeld & Nicolson
Richard Dawkins	<i>The Oxford Book of Modern Science Writing</i>	OUP
Judson, Olivia	<i>Dr Tatania's Sex Advice to All Creation</i>	Metropolitan
Lomborg, Bjørn	<i>The Skeptical Environmentalist</i>	CUP
Ridley, Matt	<i>Genome</i>	4th Estate

Series

Some centres have sought to limit their student choice to 'similar' books or to a particular series that their department keeps as a 'Science in Society library'. Some advantages to this approach might lie in the development of ideas about overall audience based on class discussion of the series. It is also possible to obtain additional discounts from some suppliers/publishers by purchasing a series.

One series that contained a number of books successfully used by students in previous years was originally published under the Science Master imprint from Weidenfeld & Nicolson

'Science Masters is a new international series in which leading scientists describe the current state of knowledge in their subject, and speculate about future developments. These short, readable books are aimed at the educated but non-specialist reader; no prior knowledge of science or mathematics is required.'

[Standard jacket statement]

PW Atkins	<i>The Periodic Kingdom</i>
Paul Davies	<i>The Last Three Minutes</i>
Ian Stewart	<i>Nature's Numbers</i>
Richard Leakey	<i>The Origin Of Humankind</i>
John D Barrow	<i>The Origin Of The Universe</i>
Richard Dawkins	<i>River Out Of Eden</i>
Daniel C Dennett	<i>Kinds Of Minds</i>
William H Calvin	<i>How Brains Think</i>
Stephen H Schneider	<i>Laboratory Earth: The Planetary Gamble We Can't Afford To Lose</i>
Susan A Greenfield	<i>The Human Brain: A Guided Tour</i>
Jared Diamond	<i>Why Is Sex Fun? The Evolution Of Human Sexuality</i>
Robert A Weinberg	<i>One Renegade Cell: The Origins Of Cancer</i>
George C Williams	<i>The Pony Fish's Glow: And Other Clues To Plan And Purpose In Nature</i>
Daniel Hillis	<i>The Pattern On The Stone</i>
Stephen J Gould	<i>Evolution & The History Of Life</i>

Many of these are in libraries or now available as Phoenix paperbacks — part of the extensive science lists of Orion group: www.orionbooks.co.uk (navigate to Non-Fiction, Science).

An excellent list has been created in the last few years by Macmillan Science <http://www.macmillanscience.com/>

Timothy Clack	<i>Ancestral Roots</i>	0230201822
Gary Lewis	<i>The Making of Champions</i>	0230210163
Mark Honigsbaum	<i>Living with Enza</i>	0230217745
Michael Hanlon	<i>Eternity</i>	0230219314
AJ Meadows	<i>Science and Controversy</i>	0230220207
Chris Turney	<i>Ice, Mud and Blood</i>	0230553826
Neil Hook and Mark L Brake	<i>Different Engines</i>	0230019803
Guy Brown	<i>The Living End</i>	0230517579
Jeff Gomez	<i>Print Is Dead</i>	0230527167
Brian Clegg	<i>Light Years</i>	0230527256
Michael Hanlon	<i>Ten Questions Science Can't Answer (Yet)</i>	0230517587
Chris Turney Bones	<i>Rocks and Stars</i>	1403985995

Albert Einstein and Max Born Born	<i>Einstein Letters 1916-1955</i>	1403944962
Joel N Shurkin	<i>Broken Genius</i>	1403988153
Dave Reay	<i>Climate Change Begins at Home</i>	0230007546
Chris Nunn	<i>De La Mettrie's Ghost</i>	1403994951
Henry Nicholls	<i>Lonesome George</i>	1403945764
Mary Stopes-Roe	<i>Mathematics With Love</i>	1403944989
Mark Haw	<i>Middle World: The Restless Heart of Matter and Life</i>	1403986037
Jonathan Balcombe	<i>Pleasurable Kingdom</i>	1403986010
Mike Stebbins	<i>Sex, Drugs and DNA</i>	0230521126
Charles S Cockell	<i>Space On Earth: Saving Our World by Seeking Others</i>	023000752X
Michael Hanlon	<i>The Science of the Hitchhiker's Guide to the Galaxy</i>	0230008909
Toby Murcott	<i>The Whole Story: Alternative Medicine On Trial</i>	0230007538
Andrew Meharg	<i>Venomous Earth How Arsenic Caused The World's Worst Mass Poisoning</i>	1403944997
Thomas H�usler	<i>Viruses Vs Superbugs A Solution to the Antibiotics Crisis?</i>	1403987645

Other series that you might consider (from within which you would need to select the appropriate 'science' publications) include:

Canto (paperback) series from Cambridge University Press
 'for Beginners' series from Pantheon books
 4th Estate (www.4thestate.co.uk)

A personal library

One teacher and examiner has built up a personal 'Science in Society Library' over the last few years. This contains books that seemed of particular interest or suitable for certain students:

Richard Dawkins	<i>A Devil's Chaplain: Selected Essays</i>	George Weidenfeld & Nicholson	0297829734
Bill Bryson	<i>A Short History of Nearly Everything</i>	Doubleday	0385408188
Steve Jones	<i>Almost Like a Whale</i>	Doubleday	0385409850
Carl Djerassi	<i>An Immaculate Misconception</i>	Imperial College Press	1860942482
Al Gore	<i>An Inconvenient Truth</i>	Rodale Books	0747589062
Katrina S Firlik	<i>Another Day in the Frontal Lobe</i>	Phoenix	9780753821527
Ben Goldacre	<i>Bad Science</i>	Fourth Estate	9780007240197
Stephen Poliakoff	<i>Blinded by the Sun and Sweet Panic</i>	A&C Black	0413707008
Chris Turney	<i>Bones, Rocks and Stars: The Science of When Things Happened</i>	Macmillan	1403985995
Adrian Desmond	<i>Charles Darwin</i>	Oxford University Press	0199213542
Dave Reay	<i>Climate Change Begins at Home</i>	Macmillan	1403945780
Robert Crawford	<i>Contemporary Poetry and Contemporary Science</i>	Oxford University Press	0199258120
Michael Frayn	<i>Copenhagen</i>	A&C Black	0413724905
Steve Jones	<i>Coral: a pessimist in paradise</i>	Little, Brown	9780316729383
Crispin Whittell	<i>Darwin in Malibu</i>	A&C Black	0413773647
Georgina Ferry	<i>Dorothy Hodgkin: A Life</i>	Granta Books	1862071675
Alex Boesie	<i>Elephants on acid and other bizarre experiments</i>	Boxtree	9780752226743
Arthur I Miller	<i>Empire of the Stars</i>	, Little, Brown	0316725552
Hugh Aldersey-Williams	<i>Findings: Hidden Stories in First-Hand Accounts of Scientific Discovery</i>	Lulox	0954898001
Dava Sobel	<i>Galileo's Daughter: A Drama of Science, Faith, And Love</i>	Fourth Estate	1857028619
Peter Atkins	<i>Galileo's Finger: The Ten Great Ideas of Science</i>	Oxford University Press	0198609418
Matt Ridley	<i>Genome: The Autobiography of Species in 23 Chapters</i>	Fourth Estate	185702835X
Jason Cowley (Ed)	<i>Granta 102: The new nature writing</i>	Granta Books	9781905881024
Francis Wheen	<i>How Mumbo-jumbo Conquered the World</i>	Harper Perennial	0007140975
Michael Jonathan Reiss	<i>Improving Nature?: The Science and Ethics of Genetic Engineering</i>	Cambridge University Press	0521637546
Eric R Kandel	<i>In Search of Memory</i>	W. W. Norton	0393329372
Lisa Jardine	<i>Ingenious Pursuits: Building the Scientific Revolution</i>	Little, Brown	0316647527
John Brockman	<i>Intelligent Thought: Science versus the Intelligent Design Movement</i>	Vintage	0307277224
James Gleick	<i>Isaac Newton</i>	Fourth Estate	0007163177
Lewis Dartnell	<i>Life in the Universe</i>	Oneworld Publications	9781851685059
Henry Nicholls	<i>Lonesome George</i>	Macmillan	1403945764

Antonio Damasio	<i>Looking for Spinoza</i>	Random House	0434007870
Simon Garfield	<i>Mauve</i>	Faber and Faber	0571209173
Carl Djerassi	<i>Menachem's Seed: A Novel</i>	University of Georgia Press	0820319252
Mark Haw	<i>Middle World: The Restless Heart of Matter and Life</i>	Macmillan	1403986037
Matt Ridley	<i>Nature Via Nurture</i>	Fourth Estate	1841157457
Carl Djerassi	<i>Newton's Darkness: Two Dramatic Views</i>	Imperial College Press	186094390X
Carl Djerassi	<i>No: A Novel</i>	University of Georgia Press	0820320323
Melvyn Bragg	<i>On Giant's Shoulders</i>	Hodder & Stoughton	0340712597
Martin Rees	<i>Our Final Century</i>	Heinemann	0434008095
Carl Djerassi	<i>Oxygen</i>	Wiley-VCH	3527304134
Keith Ward	<i>Pascal's Fire: Scientific Faith and Religious Understanding</i>	Oneworld	1851684468
Jackie Leach Sculley	<i>Playing in the Presence: Genetics, Ethics and Spirituality</i>	Quaker Books	085245337X
Nick Lane	<i>Power, Sex, Suicide: Mitochondria and the Meaning of Life</i>	Oxford University Press	0192804812
Arthur Raistrick	<i>Quakers in Science and Industry</i>	William Sessions Limited	1850721068
Gerd Gigerenzer	<i>Reckoning with Risk: Learning to Live with Uncertainty</i>	Allen Lane	0713995122
Chris McManus	<i>Right Hand, Left Hand</i>	Weidenfeld & Nicolson	0297645978
Brenda Maddox	<i>Rosalind Franklin: The Dark Lady of DNA</i>	Harper Collins	0002571498
Terry Pratchett	<i>Science of Discworld III: Darwin's Watch</i>	Ebury Press	0091898242
Sue Hubbell	<i>Shrinking the Cat: Genetic Engineering Before We Knew About Genes</i>	Mariner Books	0618257489
Rachel Carson	<i>Silent Spring (Penguin Modern Classics)</i>	Penguin Classics	0141184949
Richard P Feynman	<i>Six Easy Pieces</i>	Penguin	0140276661
Mary Roach	<i>Spook: Science Tackles the Afterlife</i>	W. W. Norton	0393329127
Daniel Gilbert	<i>Stumbling on Happiness</i>	Harper Perennial	0007183135
Rose Shapiro	<i>Suckers: How alternative medicine makes fools of us all</i>	Harvill Secker	9781846550287
Richard Dawkins	<i>The Ancestor's Tale</i>	Phoenix	0753819961
Nassim Nicholas Taleb	<i>The Black Swan</i>	Penguin	9780141034591
Georgina Ferry & John Sulston	<i>The Common Thread</i>	Bantam Press	0593048016
James Muirden	<i>The Cosmic Verses: A Rhyming History of the Universe</i>	Michael O'Mara Books	1843172186
Lisa Jardine	<i>The Curious Life of Robert Hooke</i>	HarperCollins	0007151756
Harry M Collins	<i>The Golem: What You Should Know about Science</i>	Cambridge University Press	0521645506
Richard Hamblyn	<i>The Invention of Clouds</i>	Picador	0330391941
David E Morse	<i>The Iron Bridge</i>	Harcourt	0151002592

Steve Jones	<i>The Language of the Genes</i>	Flamingo	0006546765
Simon Winchester	<i>The Map That Changed the World</i>	Penguin	0140280391
Dick Taverne	<i>The March of Unreason</i>	Oxford University Press	0199205620
Thomas P Slaughter	<i>The Natures of John and William Bartram</i>	Knopf	0679430458
Richard Dawkins	<i>The Oxford Book of Modern Science Writing</i>	Oxford University Press	9780199216802
Carl Djerassi	<i>The Pill, Pygmy Chimps, and Degas' Horse</i>	Basic Books	0465057586
Tim R Birkhead	<i>The Red Canary</i>	Weidenfeld & Nicolson	0297829963
L Wolpert	<i>The Unnatural Nature of Science</i>	Faber and Faber	0571164900
Elizabeth Pisani	<i>The Wisdom of Whores</i>	Granta	9781847080004
Carl Djerassi	<i>This Man's Pill</i>	Oxford University Press	0198508727
Susan Greenfield	<i>Tomorrow's People: How 21st Century Technology is Changing the Way We Think and Feel</i>	Allen Lane	0713996315
Len Fisher	<i>Weighing the Soul</i>	Phoenix	0753819910