



Reading and activities list for Physics & Philosophy

Checklist of Actions for Oxbridge preparation

- Complete the course and college research booklet which covers entry requirements for your course (e.g. admissions tests during interviews). Use it to help you make informed choices.
- Respond and maintain email contact with your OMS Mentor and do not hesitate to ask questions which may help your Oxbridge preparation.
- Read British broadsheets such as The Daily Telegraph, The Independent or The Guardian preferably every day (if not feasible, then at weekends). Think critically about what you have read; what issues are raised?; What assumptions are being made? What information is being relied on to draw which conclusions? How would you frame a counter-argument?
- Make note of subject-related terminology to look up definitions with the aim of working them into future academic discussions on your chosen Oxbridge course.
- Keep a "Learning Log". Note down (i) book titles/ articles (ii) author (iii) your thoughts, feelings and observations (iv) context and relevance of the book/article (v) whether you agree with what you have read.

PHYSICS

- Visit the Royal Society website, which contains all the important science news. It also lists all forthcoming science programmes and public lectures.
- Start/continue reading science journals i.e. New Scientist or Scientific American, or Physics
- Look at a wide range of science books to familiarise yourself with ideas, problems and terminology. Try to pick two to three books from each list below. The choice should be based on your own interests, but make sure not all are on the same topic.
- Jot down key insights you have gained from these books, but don't take detailed notes. Start with the biology and chemistry books, as they will help you with your AS levels. The medicine ones can wait until the summer holidays.

Any books by Albert Einstein (suggestions below)

- *The World as I See it*
- *Relativity: The Special and the General Theory Second Edition*
- *The Essential Einstein: His Greatest Works*
- *Einstein's Miraculous Year: Five Papers That Changed the Face of Physics*
- *Sidelights on Relativity*
- *The Principle of Relativity*
- *Einstein's Essays in Science*
- *50 Physics Ideas You Really Should Know* by J. Baker
- *Mad about Physics* by C. Jargodzki
- *New Physics for the 21st Century* by G. Fraser
- *The Character of Physical Law* by R. Feynman
- *QED: The strange theory of light and matter* by R. Feynman
- *The Elegant Universe* by Brian Greene
- *In Search of the Big Bang* by J. Gribbon
- *Genesis Machines: The New Science of Biocomputation* by Martyn Amos
- *Critical Mass: How One Thing Leads to Another* by Philip Ball
- *The Infinite Book: A Short Guide to the Boundless, Timeless and Endless* by John D. Barrow
- *How Long Is a Piece of String?* By Rob Eastaway and Jeremy Wyndham
- *Chaos: Making a New Science* by James Gleick
- *The Elegant Universe: Superstrings, Hidden Dimensions and the Quest for the Ultimate Theory* by Brian Greene
- *The Equation That Couldn't Be Solved* by Mario Livio

- *Black Holes and Gamma Rays: The Story of Physics & Philosophy* by Chodos and Jennifer Ouellette
- *Dr. Riemann's Zeros* by Karl Sabbagh
- *Zero: The Biography of a Dangerous Idea* by Charles Seife
- *Fermat's Last Theorem: The story of a riddle that confounded the world's greatest minds for 358 years* by Simon Singh

Keep your maths skills fresh and teach yourself enough statistics to construct and interpret basic medical charts. You can find interesting maths problems and help with solving them on two Cambridge websites:

- NRICH - <http://nrich.maths.org/public/index.php>
- Plus online magazine - <http://pass.maths.org.uk/>

Learn to express your own views by referring to what you have read or heard from a reputable source. When researching, use reliable sources and make sure you can explain what makes a source reliable.

Check that you understand and can define the key concepts you come across in your reading, creating a cumulative list of definitions during your Oxbridge preparation.

Philosophy

General Introduction

Good for getting an idea of what academic philosophy is like;

<input type="checkbox"/> A. J. Ayer	<i>The Central Questions of Philosophy</i> (Penguin)
<input type="checkbox"/> A. J. Ayer	<i>Language, Truth and Logic</i> (Penguin)
<input type="checkbox"/> S. Blackburn	<i>Think</i> (Oxford University Press)
<input type="checkbox"/> J. Hospers	<i>An Introduction to Philosophical Analysis</i> (Routledge)
<input type="checkbox"/> T. Nagel	<i>What does it all mean?</i> (Oxford University Press)
<input type="checkbox"/> B. Russell	<i>The Problems of Philosophy</i> (Oxford University Press)
<input type="checkbox"/> W. Poundstone	<i>Labyrinths of Reason: Paradox, Puzzles and the Fruit of Knowledge</i> (Penguin)

Theory of Knowledge

Some of the core relevant texts for General Philosophy

<input type="checkbox"/> A. J. Ayer	<i>The Problem of Knowledge</i> (Penguin)
<input type="checkbox"/> R. Descartes	<i>Meditations</i>
<input type="checkbox"/> D. Hume	<i>An Enquiry Concerning Human Understanding</i>

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Logic

<input type="checkbox"/> V. Halbach	<i>The Logic Manual</i> (Oxford University Press) - Official Course Text
<input type="checkbox"/> W. Hodges	<i>Logic</i> (Penguin)
<input type="checkbox"/> Stephen Pinker	<i>The Language Instinct</i>

For interesting ideas and background, you could try:

<input type="checkbox"/> Douglas Hofstadter	<i>Gödel, Escher, Bach</i>
<input type="checkbox"/> Raymond Smullyan	<i>Forever Undecided: a puzzle guide to Gödel</i>

Philosophy of Space and Time

Studied, from a historical perspective. The Leibniz-Clarke correspondence is a seventeenth-century debate between Leibniz and (effectively) Isaac Newton, about the nature of space; it's the course text. Barbour's book is a (semi-popular) modern-perspective account.

<input type="checkbox"/> Leibniz and Clarke	<i>The Leibniz-Clarke Correspondence</i> (Manchester University Press)
<input type="checkbox"/> J. Barbour	<i>The End of Time</i> (Weidenfeld and Nicolson)

Philosophy of Science

Not actually studied until the second year but may be of interest, and of general relevance to getting an understanding of academic philosophy.

<input type="checkbox"/> A. Bird	<i>Philosophy of Science</i> (UCL Press)
<input type="checkbox"/> R. Harre	<i>Philosophy of Science</i> (Oxford University Press)
<input type="checkbox"/> J. Ladyman	<i>Understanding Philosophy of Science</i> (Routledge)
<input type="checkbox"/> W. Newton-Smith	<i>The Rationality of Science</i> (Routledge)

Note

1. Please don't imagine that you should try to read everything on the list! It's much too long for that. Look at however much you have time for. At a minimum, though, try to read at least something from each of lists 1-2, the first 20-25 sections of Hodges, and the first seven chapters of Pinker.
2. Philosophy books should be read slowly. It is a good idea to pause after every ten or twenty pages, and to make notes on the course of the argument (together with any queries or criticisms that have occurred to you).