

## IGCSE 21<sup>st</sup> Century Science

IGCSE 21<sup>st</sup> Century Science is based on a curriculum model for science that offers flexibility and genuine choice. Cambridge IGCSE 21<sup>st</sup> Century Science meets the needs of students who are not traditional scientists, but who would like to follow a course that emphasises the development of scientific literacy, enabling students to make sense of the science they come across in everyday life. One of its main aims is to help prepare the students of today for a life where they will need to make informed choices about how they live their lives.

The course is divided up into nine different modules (three each for Biology, Chemistry and Physics) as summarised below:

<p><b>B1: You and Your Genes</b></p> <ul style="list-style-type: none"> <li>• What are genes and how do they affect the way that organisms develop?</li> <li>• Why can people look like their parents, brothers and sisters, but not be identical to them?</li> <li>• How can and should genetic information be used? How can we use our knowledge of genes to prevent disease?</li> <li>• What are stem cells, and why could they be useful in treating some diseases?</li> </ul>	<p><b>C1: Air Quality</b></p> <ul style="list-style-type: none"> <li>• Which chemicals make up air, and which ones are pollutants? How do I make sense of data about air pollution?</li> <li>• What chemical reactions produce air pollutants? What happens to these pollutants in the atmosphere?</li> <li>• Is air pollution harmful to me, or to my environment?</li> <li>• What choices can we make personally, locally, nationally or globally to improve air quality?</li> </ul>	<p><b>P1: The Earth in the Universe</b></p> <ul style="list-style-type: none"> <li>• What do we know about the Earth and Space?</li> <li>• How have the Earth's continents moved, and with what consequences?</li> <li>• What is known about stars and galaxies?</li> <li>• How do scientists develop explanations of the Earth and Space?</li> </ul>
<p><b>B2: Keeping Healthy</b></p> <ul style="list-style-type: none"> <li>• How do our bodies resist infection?</li> <li>• What are vaccines and how do they work?</li> <li>• What are antibiotics, and why can they become less effective? How are new drugs developed and tested?</li> <li>• What factors increase the</li> </ul>	<p><b>C2: Material Choices</b></p> <ul style="list-style-type: none"> <li>• What different properties do different materials have?</li> <li>• Why is crude oil important as a source of new materials such as plastics and fibres?</li> <li>• Why does it help to know about the molecular structure of</li> </ul>	<p><b>P2: Radiation and Life</b></p> <ul style="list-style-type: none"> <li>• What types of electromagnetic radiation are there? What happens when radiation hits an object?</li> <li>• Which types of electromagnetic radiation harm living tissue and why?</li> <li>• How does</li> </ul>

<p>risk of heart disease?</p>	<p>materials such as plastics and fibres?</p> <ul style="list-style-type: none"> <li>• When buying a product, what else should we consider besides its cost and how well it does its job? How should we manage the wastes that arise from our use of materials?</li> </ul>	<p>electromagnetic radiation make life on Earth possible?</p> <ul style="list-style-type: none"> <li>• What is the evidence for global warming, why might it be occurring, and how serious a threat is it?</li> <li>• What ideas about risk do citizens and scientists use?</li> </ul>
<p>B3: Life on Earth</p> <ul style="list-style-type: none"> <li>• How did life on Earth begin and evolve?</li> <li>• How have scientists developed explanations of evolution?</li> <li>• How did humans evolve? How are our nervous systems organised?</li> <li>• Why do some species become extinct, and does it matter?</li> <li>• What is the importance of biodiversity?</li> </ul>	<p>C3: Food Matters</p> <ul style="list-style-type: none"> <li>• What is the difference between intensive and organic farming?</li> <li>• Why are chemicals deliberately added to food?</li> <li>• How can we make sure that our food does not contain chemicals that may be harmful to health?</li> <li>• Why does what we eat affect our health?</li> </ul>	<p>P3: Radioactive Materials</p> <ul style="list-style-type: none"> <li>• Why are some materials radioactive?</li> <li>• How can radioactive materials be used and handled safely, including wastes?</li> <li>• How can electricity be generated? What can be done with nuclear wastes?</li> <li>• What are the health risks from radioactive materials?</li> </ul>

The course is examined externally at the end of year 11, when students will sit two papers that test their understanding of the content covered; one multiple-choice and one extended written paper. In addition to this, students also have to sit a data analysis and interpretation paper that tests their ability to interpret data generated in a practical setting. Finally, they have to complete a case study, which is of relevance to the local area, and tests their understanding of local issues in relation to the core content of the course. The case study is completed during Year 11.

The expectation at TIS is that all students will complete the extended CIE syllabus, covering IGCSE grades A\*-D. Any student who is not meeting these expectations can be asked to take the core syllabus, covering IGCSE grades C-G.

During the course of the programme at TIS, students are regularly assessed, both formally and informally, using a range of different strategies. There is a strong emphasis on the practical nature of the subject and students are expected to develop

excellent practical skills through a range of hands-on experiences. There are formal tests carried out at the end of each of the nine units (approximately every six weeks).

*Texts:*

Twenty First Century Science: GCSE Science Higher Textbook.

Publisher: Oxford University Press

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Twenty First Century Science: GCSE Science Higher Workbook.

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