

Advance Information for Summer 2022

GCSE (9–1)

Combined Science B (Twenty First Century Science)

J260

We have produced this advance information to help support all teachers and students with revision for the Summer 2022 exams.

Information

- The format/structure of the papers remains unchanged.
- This notice covers all examined components.
- For each paper, the main list shows the major focus of the content of the exam.
- Topics **not** assessed, either directly or synoptically, have also been listed.
- The information is presented in specification order, **not** in question order.
- Assessment of practical skills, maths skills, and Working Scientifically skills will occur throughout all of the papers.
- You are **not** permitted to take this notice into the exam.
- This document has **11** pages.

Advice

- It is advised that teaching and learning should still cover the entire subject content in the specification, so that students are as well prepared as possible for progression.
- Topics not explicitly given in either list may appear in low tariff questions or via synoptic questions (e.g., questions where students are asked to bring together knowledge, skills and understanding from across the specification).
- Students will still be expected to apply their knowledge to unfamiliar contexts.

If you have any queries about this notice, please call our Customer Support Centre on **01223 553998** or email general.qualifications@ocr.org.uk.

J260/01 Biology, Foundation Tier

- Section B1.1 What is the genome and what does it do?
- Section B2.5 How can we treat disease?
- Section B3.1 What happens during photosynthesis?
- Section B3.2 How do producers get the substances they need?
- Section B3.3 How are organisms in an ecosystem affected by conditions in an ecosystem?
- Section B4.3 How do organisms grow and develop?
- Section B6.3 How is biodiversity threatened and how can we protect it?

Required practical skills that **will be assessed**:

- Practical Activity Group B1: Using a light microscope to make observations of biological specimens
- Practical Activity Group B4: Investigating the effect of pH on the rate of photosynthesis.

Topics **not assessed** in this paper:

- Section B1.2 How is genetic information inherited?
- Section B1.3 How can and should gene technology be used?
- Section B4.2 How do we know about mitochondria and other cell structures?
- Section B4.4 Should we use stem cells to treat damage and disease?
- Section B5.5 What role do hormones play in human reproduction?
- Section B5.6 What can happen when organs and control systems stop working?
- Section B6.1 How was the theory of evolution developed?
- Section B6.2 How does our understanding of biology help us classify the diversity of organisms on Earth?

J260/02 Chemistry, Foundation Tier

- Section C1.2 Why are there temperature changes in chemical reactions?
- Section C2.2 What does the Periodic Table tell us about the elements?
- Section C2.3 How do metals and nonmetals combine to form compounds?
- Section C2.4 How are equations used to represent chemical reactions?
- Section C3.4 Why is crude oil important as a source of new materials?
- Section C4.3 What are nanoparticles so useful?
- Section C5.1 How are chemicals separated and tested for purity?
- Section C5.2 How are the amounts of substances in reactions calculated?
- Section C5.3 How are amounts of chemicals in solution measured?
- Section C6.2 How do chemists control the rate of reactions?

Required practical skills that **will be assessed**:

- Practical Activity Group C3: Using paper chromatography to investigate a dye

Topics **not assessed** in this paper:

- Section C1.4 How can scientists help improve the supply of potable water?
- Section C3.3 What are electrolytes and what happens during electrolysis?
- Section C6.3 What factors affect the yield of chemical reactions?

J260/03 Physics, Foundation Tier

- Section P1.3 How do waves behave?
- Section P2.2 How can electricity be generated?
- Section P3.1 What determines the current in an electric circuit?
- Section P4.3 What is the connection between forces and motion?
- Section P4.4 How can we describe motion in terms of energy transfers?
- Section P5.1 What is radioactivity?
- Section P6.2 How does the particle model explain the effects of heating?

Required practical skills that **will be assessed**:

- Practical Activity Group P4: Investigating the refraction of light
- Practical Activity Group P6: Investigating the I-V characteristics of a thermistor

Topics **not assessed** in this paper:

- Section P3.4 What are magnetic fields?
- Section P3.5 How do electric motors work?
- Section P6.3 How does the particle model relate to materials under stress?

J260/04 Combined Science, Foundation Tier

- Section B1.2 How is genetic information inherited?
- Section B3.3 How are organisms in an ecosystem interdependent?
- Section B5.5 What role do humans play in reproduction?
- Section C1.2 Why are there temperature changes in chemical reactions?
- Section C3.2 How are metals with different reactivities extracted?
- Section C5.2 How are amounts of substances in reactions calculated?
- Section P2.2 How much electricity can be generated?
- Section P3.1 What determines the current in an electric circuit?

Required practical skills that **will be assessed**:

- Practical Activity Group C2: Tests to identify gases

Topics **not assessed** in this paper:

- Section B1.3 How can and should gene technology be used?
- Section B2.1 What are the causes of disease?
- Section B2.2 How do organisms protect themselves against pathogens?
- Section B2.3 How can we prevent the spread of infection?
- Section B2.4 How can lifestyle, genes and the environment affect my health?
- Section B2.5 How can we treat disease?
- Section B3.2 How do producers get the substances they need?
- Section B4.2 How do we know about mitochondria and other cell structures?
- Section B4.3 How do organisms grow and develop?
- Section B4.4 Should we use stem cells to treat damage and disease?
- Section B5.1 How do substances get into, out of and around our bodies?
- Section B5.2 How does the nervous system help us respond to changes?
- Section B5.3 How do hormones control responses in the human body?
- Section B5.4 Why do we need to maintain a constant internal environment?
- Section B5.6 What can happen when organs and control systems stop working?
- Section B6.1 How was the theory of evolution developed?
- Section B6.2 How does our understanding of biology help us classify the diversity of organisms on Earth?
- Section B6.3 How is biodiversity threatened and how can we protect it?

- Section C1.3 What is the evidence for climate change, why is it occurring?
- Section C1.4 How can scientists help improve the supply of potable water?
- Section C2.1 How have our ideas about atoms developed over time?
- Section C2.2 What does the Periodic Table tell us about the elements?
- Section C2.3 How do metals and nonmetals combine to form compounds?
- Section C3.1 How are atoms held together in a metal?
- Section C3.3 What are electrolytes and what happens during electrolysis?
- Section C3.4 Why is crude oil important as a source of new materials?
- Section C4.1 How is data used to choose a material for a particular use?
- Section C4.2 How do bonding and structure affect properties of materials?
- Section C4.3 Why are nanoparticles so useful?
- Section C4.4 What happens to products at the end of their useful life?
- Section C5.1 How are chemicals separated and tested for purity?
- Section C5.3 How are amounts of chemicals in solution measured?

- Section C6.1 What useful products can be made from acids?
- Section C6.2 How do chemists control the rate of reactions?
- Section C6.3 What factors affect the yield of chemical reactions?

- Section P1.1 What are the risks and benefits of using radiations?
- Section P1.2 What is climate change and what is the evidence for it?
- Section P1.3 How do waves behave?
- Section P2.1 How much energy do we use?
- Section P3.4 What are magnetic fields ?
- Section P3.5 How do electric motors works?
- Section P4.1 What are forces?
- Section P4.2 How can we describe motion?
- Section P4.3 What is the connection between forces and motion?
- Section P4.4 How can we describe motion in terms of energy transfers?
- Section P5.1 What is radioactivity?
- Section P5.2 How can radioactive materials be used safely?
- Section P6.1 How does energy transform matter?
- Section P6.2 How does the particle mode; explain the effects of heating?
- Section P6.3 How does the particle model relate to materials under stress?

J260/05 Biology, Higher Tier

- Section 1.3 How can and should gene technology be used?
- Section 2.5 How can we treat disease?
- Section 3.2 How do producers get the substances they need?
- Section 4.1 What happens during cellular respiration?
- Section 4.3 How do organisms grow and develop?
- Section 5.2 How does the nervous system help us respond to changes?
- Section 5.3 How do hormones control responses in the human body?
- Section 6.3 How is biodiversity threatened and how can we protect it?

Required practical skills that will be assessed:

- Practical Activity Group B1: Using a light microscope to make observations of biological specimens

Topics not assessed in this paper:

- Section 1.2 How is genetic information inherited?
- Section 2.3 How can we prevent the spread of infection?
- Section 4.2 How do we know about mitochondria and other cell structures?
- Section 4.4 Should we use stem cells to treat damage and disease?
- Section 5.5 What role do hormones play in human reproduction?
- Section 6.2 How does our understanding of biology help us classify the diversity of organisms on Earth?

J260/06 Chemistry, Higher Tier

- Section C1.1 How has the Earth's atmosphere changed over time and why?
- Section C1.3 What is the evidence for climate change, why is it occurring?
- Section C2.3 How do metals and nonmetals combine to form compounds?
- Section C3.4 Why is crude oil important as a source of new materials?
- Section C4.2 How do bonding and structure affect properties of materials?
- Section C5.2 How are the amounts of substances in reactions calculated?
- Section C5.3 How are amounts of chemicals in solution measured?
- Section C6.2 How do chemists control the rate of reactions?
- Section C6.3 What factors affect the yield of chemical reactions?

Required practical skills that **will be assessed**:

- Practical Activity Group C2: Tests to identify gases

Topics **not assessed** in this paper:

- Section C1.4 How can scientists help improve the supply of potable water?
- Section C3.3 What are electrolytes and what happens during electrolysis?
- Section C4.4 What happens to products at the end of their useful life?
- Section C5.1 How are chemicals separated and tested for purity?

J260/07 Physics, Higher Tier

- Section P1.3 How do waves behave?
- Section P2.2 How can electricity be generated?
- Section P3.1 What determines the current in an electric circuit?
- Section P3.5 How do electric motors work?
- Section P4.3 What is the connection between forces and motion?
- Section P5.1 What is radioactivity?
- Section P6.1 How does energy transform matter?
- Section P6.2 How does the particle model relate to materials under stress?

Required practical skills that will be assessed:

- Practical Activity Group P6: Using apparatus to measure current, potential difference and resistance.
- Practical Activity Group P4: Investigating the refraction of light

Topics not assessed in this paper:

- Section P1.1 What are the risks and benefits of using radiations?
- Section P4.2 How can we describe motion?
- Section P6.3 How does the particle model relate to materials under stress?

J260/08 Combined Science, Higher Tier

- Section B1.3 How can and should gene technology be used?
- Section B3.3 How are organisms in an ecosystem interdependent?
- Section B4.3 How do organisms grow and develop?
- Section C3.2 How are metals with different reactivities extracted?
- Section C4.3 Why are nanoparticles so useful?
- Section P3.1 What determines the current in an electric circuit? 5-10%
- Section P4.3 What is the connection between forces and motion?
- Section P5.1 What is radioactivity?

Required practical skills that **will be assessed**:

- Practical Activity Group C2: Tests to identify gases
- Practical Activity Group B1: Investigating mitosis using a light microscope
- Practical Activity Group P6: Investigating the I-V characteristics of a thermistor
- Practical Activity Group C1: Using apparatus to set up and use electrochemical cells

Topics **not assessed** in this paper:

- Section B2.1 What are the causes of disease?
 - Section B2.2 How do organisms protect themselves against pathogens?
 - Section B2.3 How can we prevent the spread of infection?
 - Section B2.4 How can lifestyle, genes and the environment affect my health?
 - Section B2.5 How can we treat disease?
 - Section B3.1 What happens during photosynthesis?
 - Section B3.2 How do producers get the substances they need?
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