Unit Code: J258/02
Qual Name: GCSE Chemistry B (Twenty First Century Science)
Qual Title: Chemistry Foundation
Tier Foundation

Question Set	Q. No	Total Marks	AO	Spec Ref.	Topic	**Question Subject**, If required	Additional Notes/Comments	Maths Skills	Practical Assessment Skills
1	1a	2	1	2.4.4	How are equations used to represent chemical reactions?	Carbon and graphite / states	Synoptic		
1	1b	2	1	1.1.9, 4.3.7	How do bonding and structure affect properties of materials?	Carbon and graphite	Synoptic		
1	1c	2	1	4.3.5, 3.4.14, 4.3.8	How do bonding and structure affect properties of materials?	Carbon and graphite	Synoptic		
2	1ai	2	1	1.1.9, 1.1.10	How has the Earth's atmosphere changed over time, and why?	Air quality / nitrogen oxides		Y	
2	1aii	2	1	1.1.7	How has the Earth's atmosphere changed over time, and why?	Air quality / nitrogen oxides			
2	1b	2	2	1.1.8	How has the Earth's atmosphere changed over time, and why?	Air quality / nitrogen oxides	Maths. Ideas about science.		
2	1ci	1	1	1.1.8	How has the Earth's atmosphere changed over time, and why?	Air quality / nitrogen oxides	Ideas about science		
2	1cii	2	2	1.1.8	How has the Earth's atmosphere changed over time, and why?	Air quality / nitrogen oxides	Maths. Ideas about science.		
3	1a	2	1	1.4.1, 5.1.7	How can scientists help improve the supply of potable water?	Distillation	Synoptic		
3	1bi	2	1	2.4.1, 2.4.3, 1.4.1	How can scientists help improve the supply of potable water?	Water treatment	Ideas about science		
3	1bii	3	1	1.1.12, 1.4.2	How can scientists help improve the supply of potable water?	Gas tests	Practical skills		
4	1ai	2	2	3.4.4	Why is crude oil important as a source of new materials?	Alkanes and alkenes			
4	1aii	1	2	3.4.4	Why is crude oil important as a source of new materials?	Homologouus series		Y	
4	1bi	2	2	3.4.17	Why is crude oil important as a source of new materials?	Alkanes and alkenes		Y	
4	1bii	1	2	3.4.16	Why is crude oil important as a source of new materials?	Alkanes and alkenes			

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4	1ci	2	2	3.4.16/17	Why is crude oil important as a source of new materials?	Alkanes and alkenes	Maths	Y	
4	1cii	1	2	3.4.6, 3.4.16, 3.4.17	Why is crude oil important as a source of new materials?	Empirical formulae	Maths	Y	
5	1a	3	2	2.1.2, 2.1.7, 2.2.1, 2.3.4	How have our ideas about atoms developed over time? /What does the Periodic Table tell us about the elements? /How do metals and non-metals combine to form compounds?	Group 7 / structure of atoms and ions			
5	1bi	2	1	2.1.2, 2.1.7, 2.3.12, 2.3.5	How have our ideas about atoms developed over time? /What does the Periodic Table tell us about the elements? /How do metals and non-metals combine to form compounds?	Group 7 / structure of atoms and ions			
5	1bii	1	1	2.1.2, 2.1.7, 2.3.12	How have our ideas about atoms developed over time? /What does the Periodic Table tell us about the elements? /How do metals and non-metals combine to form compounds?	Group 7 / structure of atoms and ions			
6	1ai	2	2	5.3.3	Calculating substances in reactions	This question tests practical and mathematical skills about copper oxide reacting with hydrochloric acid.	Maths	Y	
6	1aii	1	2	5.3.11	Calculating substances in reactions	This question tests practical and mathematical skills about copper oxide reacting with hydrochloric acid.	Maths	Y	Y
6	1bi	2	1	5.1.7/5.1.8	Separating and testing chemicals for purity	This question tests practical and mathematical skills about copper oxide reacting with hydrochloric acid.	Practical skills		Y
6	1bii	1	2	5.3.13	Calculating substances in reactions	This question tests practical and mathematical skills about copper oxide reacting with hydrochloric acid.	Practical skills		Y
7	1ai	1	2	6.2.8	How do chemists control the rate of reactions?	Rate of reaction	Maths. Practical Skills	Y	Y
7	1aii	2	2	6.2.8	How do chemists control the rate of reactions?	Rate of reaction	Maths. Practical Skills	Y	Y
7	1b	2	3	6.2.8, 6.2.11	How do chemists control the rate of reactions?	Rate of reaction	Maths. Practical Skills		Y

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7	1ci	2	2	6.2.8, 6.2.10, 6.2.13	How do chemists control the rate of reactions?	Rate of reaction	Maths. Practical Skills	Y	Y
7	1cii	2	3	6.2.8, 6.2.10, 6.2.13	How do chemists control the rate of reactions?	Rate of reaction	Maths. Practical Skills	Y	Y
7	1ciii	1	1	6.2. 13	How do chemists control the rate of reactions?	Rate of reaction	Maths. Practical Skills	Y	
8	1a*	6	3	5.2.5, 5.2.7	How do chemists find the composition of unknown samples? (separate science only)	Spectroscopy			
8	1b	3	1 and 2	5.2.6	How do chemists find the composition of unknown samples? (separate science only)	Spectroscopy			
8	1c	2	1	5.4.1	How are the amounts of chemicals in solution measured?	Spectroscopy			
9	1a*	6	3	4.5.4a, 4.5.4b, 4.5.5, 4.5.6	What happens to products at the end of their useful life?	Polymers and Life Cycle Assessments	Ideas about science		
9	1b	2	2	4.5.4a	What happens to products at the end of their useful life?	Polymers and Life Cycle Assessments	Ideas about science		
10	1a	3	1 and 2	6.1.4	What useful products can be made from acids?	Properties of alkenes and carboxylic acids	Overlap Question. Practical skills		Y
10	1bi	2	2	6.1.4	What useful products can be made from acids?	Hazards and risk	Overlap Question. Practical skills		Y
10	1bii	1	2	6.1.4	What useful products can be made from acids?	Hazards and risk	Overlap Question. Practical skills		Y
10	1biii	3	3	3.4.18	Why is crude oil important as a source of new materials?	Hazards and risk	Overlap Question. Practical skills		Y
11	1a	1	2	2.2.2	What does the Periodic Table tell us about the elements?	Development of the Periodic Table	Overlap question. Ideas about science.		
11	1b	1	2	2.2.2	What does the Periodic Table tell us about the elements?	Development of the Periodic Table	Overlap question. Ideas about science.		
11	1c	2	2	2.2.2, 2.5.1	What does the Periodic Table tell us about the elements?	Development of the Periodic Table	Overlap question. Ideas about science.		
11	1d	1	1	2.5.1	What are the properties of transition metals?	Development of the Periodic Table	Overlap question. Ideas about science.		
11	1ei	2	1	6.1.4	What useful products can be made from acids?	Testing pH	Overlap question. Practical skills		Y
11	1eii	2	3	6.1.4	What useful products can be made from acids?	Testing pH	Overlap question. Practical skills		Y

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12	1ai	2	2	5.4.4/5/6, 6.1.4	How are the amounts of chemicals in solution measured?	pH changes during titrations/ graphs	Maths. Practical skills	Y	Y
12	1aii	2	1	5.4.4/.5/6 /, 6.1.4	How are the amounts of chemicals in solution measured?	pH changes during titrations/ graphs	Maths. Practical skills		Y
12	1bi	1	2	1.1.10 /11	How has the Earth's atmosphere changed over time, and why?	Equations and formulae	Maths	Y	
12	1bii	2	1	1.1.10	How has the Earth's atmosphere changed over time, and why?	Equations and formulae			
12	1ci	2	1	5.4.5/6, 1.1.10	How are the amounts of chemicals in solution measured?	Equation for neutralisation			
12	1cii	1	1	5.4.6	How are the amounts of chemicals in solution measured?	Neutralisation			
13	1a	2	2	4.2.1/2	What are the different types of polymers?	Formulae of polymers and monomers			
13	1b	2	1	4.2.1/2	What are the different types of polymers?	Formulae of polymers and monomers			
13	1ci	2	2	5.3.3	How are the amounts of substances in reactions calculated?	Relative formula mass	Maths	Y	
13	1cii	1	2	4.2.1/5.3. 3	How are the amounts of substances in reactions calculated?	Relative formula mass calculation	Maths	Y	
14	1a	1	1	3.2.3, 1.1.10/11	How are metals with different reactivities extracted?	Heating carbonates	Synoptic question		Y
14	1b	2	1	6.4.9, 3.2.4	How are chemicals made on an industrial scale?	Interpreting Flow charts	Synoptic question. Ideas about Science		Y
14	1ci	2	2	3.2.4	What factors affect the yield of chemical reactions?	Theoretical yield / graphs	Maths. Practical Skills	Y	Y
14	1cii	1	2	3.2.4	What factors affect the yield of chemical reactions?	Theoretical yield / graphs	Maths. Practical Skills		Y
14	1ciii	1	2	3.2.4, 5.3.11	What factors affect the yield of chemical reactions?	Theoretical yield / graphs	Synoptic question Maths	Y	Y
14	1civ	2	3	3.2.4, 6.1.2, 5.3.13	How are the amounts of substances in reactions calculated?	Experimental methods	Synoptic question Practical Skills		Y
14	1d	2	3	5.3.11, 5.3.12, 5.3.13	How are the amounts of substances in reactions calculated?	Theoretical yield / data	Maths. Practical Skills	Y	Y
15	1a	1	2	2.4.3/4	How are equations used to represent chemical reactions?	State symbols	Practical skills	Y	
15	1b	1	2	2.4.3/4	How are equations used to represent chemical reactions?	Word equation	Practical skills		
15	1c	1	1	2.2.6	What does the Periodic Table tell us about the elements?	Reactions of group 7	Practical skills		Y

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15	1d	3	1 and 2	2.2.6/7/8, 1.2.1	What does the Periodic Table tell us about the elements?	Reactions of group 8	Practical skills. Synoptic		Y
16	1a	2	2	2.5.1, 4.1.1	How is data used to choose a material for a particular use?	Physical states and melting points	Synoptic question. Maths.	Y	
16	1bi	1	2	1.1.4, 2.5.1 , 4.1.1	How is data used to choose a material for a particular use?	Physical states and melting points	Synoptic question. Maths.		
16	1bii	2	2	2.5.1 , 4.1.1	How is data used to choose a material for a particular use?	Physical states and melting points	Synoptic question. Maths.		
16	1c	2	1	2.5.1	What are the properties of transition metals?	Transition metals			
17	1a	2	2	6.4.9, 1.2.1	How are chemicals made on an industrial scale?	Exothermic reactions	Synoptic question. Ideas about science		
17	1b	2	2	6.4.9	How are chemicals made on an industrial scale?	Interpretation of industrial process data	Ideas about science		
17	1c	2	2	6.4.9, 6.4.6	How are chemicals made on an industrial scale?	Atom economy	Ideas about science		
17	1di	2	2	6.4.9, 5.1.7/8	How are chemicals made on an industrial scale?	Separation techniques	Practical Skills		Y
17	1dii	2	1	6.4.9 , 6.4.10	How are chemicals made on an industrial scale?	Batch and continous processes	Practical Skills		Y
18	1*	6	2 and 3	1.1.1/3, 2.3.9, 3.4.14	How has the Earth's atmosphere changed over time, and why	Particle / kinetic theory	Level of response, synoptic question		
19	1ai	2	2	1.1.8	How has the Earth's atmosphere changed over time, and why	Interpretation of atmospheric composition data	Maths/ Ideas about science	Y	
19	1aii	2	3	1.1.8 /1.3.6	How has the Earth's atmosphere changed over time, and why	Interpretation of atmospheric composition data	Maths/ Ideas about science	Y	
19	1bi	3	3	1.1.8 / 1.3.5	How has the Earth's atmosphere changed over time, and why	Interpretation of climate change data	Maths/ Ideas about science	Y	
19	1bii	2	3	1.1.8 / 1.3.5	How has the Earth's atmosphere changed over time, and why	Correlation and cause	Maths/ Ideas about science		
20	1*	6	1 and 3	2.2.5/9	What does the Periodic Table tell us about the elements?	Practical procedures, Reactions in Group 1	Level of response question. Practical Skills.		Y
21	1a	3	2	5.2.2/3	How do chemists find the composition of unknown samples?	Use of flame tests to identify ions	Overlap question. Practical Skills		Y
21	1bi	1	2	5.2.4	How do chemists find the composition of unknown samples?	Use of ion tests to identify ions	Overlap question. Practical Skills		Y
21	1bii	3	3	5.2.4	How do chemists find the composition of unknown samples?	Use of ion tests to identify ions	Overlap question. Practical Skills		Y
21	1c	1	1	5.2.6	How do chemists find the composition of unknown samples?	Emission spectroscopy	Overlap question. Practical Skills		Y

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22	1ai	3	2	4.4.6/8/9	Why are nanoparticles so useful?	Surface area calculations of nanoparticles	Overlap question. Maths		
22	1aii	2	1	4.4.6/8/9	Why are nanoparticles so useful?	Surface area of nanoparticles	Overlap question. Maths		
22	1bi	2	1 and 2	4.4.1/5	Why are nanoparticles so useful?	Risk and benefits of nanoparticles.	Overlap question. Ideas about Scienc		
22	1bii	3	3	4.4.1/5	Why are nanoparticles so useful?	Risk and benefits of nanoparticles.	Overlap question. Ideas about Science.		
23	1a	2	1	1.1.9 /3.4.10	How are formulae used to represent substances?	Interpretation of dot and cross diagrams of simple molecular structures.	This is a synoptic question.		
23	1b	2	1	3.4.8/9	How are formulae used to represent substances?	Elements and compounds			
23	1c	2	1	3.4.8/9	How are formulae used to represent substances?	Interpretation of dot and cross diagrams of simple molecular structures.			
23	1d	2	1	3.4.8/9/13	How are formulae used to represent substances?	Interpretation of dot and cross diagrams of simple molecular structures.	This is a synoptic question.		
23	1e	2	1	2.3.2/3.4.9	How are formulae used to represent substances?	Electron arrangement in noble gases.	This is a synoptic question.		
24	1ai	1	3	6.1.4	What useful products can be made from acids?	Using a pH meter to test pH	Practical Skills		Y
24	1aii	2	3	6.1.4	What useful products can be made from acids?	pH readings	Practical Skills. Maths		Y
24	1bi	1	1	6.1.4	What useful products can be made from acids?	Testing pH	Practical Skills		Y
24	1bii	2	2	6.1.4	What useful products can be made from acids?	Methods of data collection/ repeatability	Practical Skills. Ideas about Science		Y
25	1a	2	1	3.4.1/4 /1.1.9	Why is crude oil important as a source of new materials?	Hydrocarbons / alkenes	This is a synoptic question. Maths		
25	1b	3	2	3.4.4/1.1.9	Why is crude oil important as a source of new materials?	Alkenes	This is a synoptic question. Maths	Y	
26	1a	1	2	6.1.1/	What useful products can be made from acids?	Names of gases			
26	1b	2	1 and 3	6.2.7	How do chemists control the rate of reactions?	Apparatus to collect gases	Practical Skills		Y
26	1ci	3	3	6.2.1/6.2.10	How do chemists control the rate of reactions?	Rates of reaction	Practical Skills. Maths.	Y	Y
26	1cii	3	3	6.2.1/6.2.10/6/2/7	How do chemists control the rate of reactions?	Rates of reaction	Practical Skills. Maths.	Y	Y
26	1d	2	1 and 2	6.2.4/6	How do chemists control the rate of reactions?	Rates of reaction	Practical Skills. Maths.	Y	Y

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27	1a*	6	1 and 2	2.3.5/6/8	How do metals and non-metals combine to form compounds?	Ionic bonding.	This is a level of response question		
27	1bi	2	1 and 2	1.1.4/1.3.5	How has the Earth's atmosphere changed over time, and why?	Melting points, states and state symbols		Y	
27	1bii	3	1 and 2	2.3.10/1.1.3/1.3.5/3.4.14	How has the Earth's atmosphere changed over time, and why?	Structure and melting points.	This is a synoptic question.	Y	
28	1a	2	1 and 2	2.4	How are equations used to represent chemical reactions?	Equations		Y	Y
28	1bi	1	2	5.3.11/12	How are the amounts of substances in reactions calculated?	Yield calculations	Practical Skills. Maths.		Y
28	1bii	3	1 and 2	5.3.11/12	How are the amounts of substances in reactions calculated?	Yield calculations	Practical Skills. Maths.	Y	Y
28	1ci	4	2	5.3.8	How are the amounts of substances in reactions calculated?	Graph drawing skills	Practical Skills. Maths.	Y	Y
28	1cii	2	2	5.3.8//3/5	How are the amounts of substances in reactions calculated?	Graph interpretation	Practical Skills. Maths.	Y	Y
29	1a	2	1	1.2.1/2/4/5	Why are there temperatures changes in chemical reactions?	Energy level diagrams		Y	Y
29	1bi	3	2 and 3	1.2.1 1.2.7	Why are there temperatures changes in chemical reactions?	Planning an experiment/exothermic reactions	Practical Skills		Y
29	1bii	1	2	1.2.1, 1.2.7	Why are there temperatures changes in chemical reactions?	Risk assessments	Practical Skills. Ideas about Science		Y
30	1a	1	3	1.1.8	How has the Earth's atmosphere changed over time, and why?	Monitoring air quality	Ideas about Science		Y
30	1bi	2	3	1.1.8	How has the Earth's atmosphere changed over time, and why?	Monitoring air quality	Ideas about Science		Y
30	1bii	1	3	1.1.8	How has the Earth's atmosphere changed over time, and why?	Monitoring air quality	Ideas about Science		
30	1c*	6	2 and 3	1.1.8 / 1.3.5	How has the Earth's atmosphere changed over time, and why?	Data interpretaion - air quality	Level of response		
31	1a	2	2	4.5.6	What happens to products at the end of their useful life?	Recycling polymers	Overlap question. Ideas about science.		
31	1bi	1	2	4.5.6	What happens to products at the end of their useful life?	Drinking water	Overlap question. Ideas about science.		
31	1bii	1	1	1.4.1 4.5.6	What happens to products at the end of their useful life?	Drinking water	Overlap question. Ideas about science.		
31	1ci	1	2	4.5.6	What happens to products at the end of their useful life?	Life cycle assessments of polymers	Overlap question. Ideas about science.		
31	1cii	1	2	4.5.6	What happens to products at the end of their useful life?	Life cycle assessments of polymers	Overlap question. Ideas about science.		
31	1d	2	1 and 2	4.5.6	What happens to products at the end of their useful life?	Life cycle assessments of polymers	Overlap question. Ideas about science.		

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31	1e	2	2	4.5.4	What happens to products at the end of their useful life?	Life cycle assessments of polymers	Overlap question. Ideas about science.		Y
32	1ai	3	2	3.3.7	What are electrolytes and what happens during electrolysis?	Products of electrolysis	Overlap question. Practical Skills		
32	1aii	2	1	1.4.2 1.1.12	How has the Earth's atmosphere changed over time, and why?	Gas tests	Overlap question. Practical Skills		
32	1aiii	2	2	3.3.7	What are electrolytes and what happens during electrolysis?	Products of electrolysis	Overlap question. Practical Skills		Y
32	1b	2	1 and 3	3.3.8	What are electrolytes and what happens during electrolysis?	Electrolysis experimental set-up	Overlap question. Practical Skills		