# AQA GCSE Chemistry
## Student checklist

C3

Name ..... Class ..... Date .....

### Structure and bonding

| Lesson | Target 4 | | Target 6 | | Target 8 | |
|---|---|---|---|---|---|---|
| C3.1 States of matter | I can identify the three states of matter and their state symbols. | ☐ | I can use data to determine the state of a substance at a given temperature. | ☐ | I can use the particle model to describe how energy, movement, and attraction between particles changes as a substance is heated or cooled. | ☐ |
| | I can describe the process of melting, freezing, boiling, and condensing. | ☐ | I can explain, in terms of particles, energy and temperature of a substance when it is at the melting point or boiling point. | ☐ | I can suggest why substances have different melting and boiling points from each other. | ☐ |
| | I can use the particle model to draw a representation of how particles are arranged in the three states of matter. | ☐ | I can describe the factors that affect rate of evaporation. | ☐ | (H) I can evaluate a model, explaining its limitations. | ☐ |
| C3.2 Atoms in ions | I can state the particles involved in ionic and covalent bonding. | ☐ | I can draw dot and cross diagrams of compounds formed between Group 1 and Group 7 elements. | ☐ | I can draw dot and cross diagrams of unfamiliar ionic compounds. | ☐ |
| | I can describe, with an example, how a Group 1 metal atom becomes a positive ion. | ☐ | I can explain how electron transfer allows ionic bonding to occur in the compound formed when a Group 1 metal reacts with a Group 7 non-metal. | ☐ | I can suggest and explain the charge of a monatomic ion based on its position in the periodic table. | ☐ |
| | I can describe, with an example, how a Group 7 non-metal atom becomes a negative ion. | ☐ | | | | |

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| C3.3 Ionic bonding | I can state that opposite charges attract. | ☐ | I can explain how the position of an element on the periodic table relates to the charge on its most stable monatomic ion. | ☐ | I can suggest the charge on unfamiliar ions using the position of the element in the periodic table. | ☐ |
| | I can write the charges of ions of Group 1, Group 2, Group 6, and Group 7 elements. | ☐ | I can explain, in terms of electronic structure, how unfamiliar elements become ions. | ☐ | I can explain the ratio of metal and non-metal ions in compounds. | ☐ |
| | I can describe an ionic lattice. | ☐ | I can interpret formula of familiar ionic compounds to determine the number and type of each ion present. | ☐ | I can generate formula of a wide range of ionic compounds when the charges of the ions are given. | ☐ |
| C3.4 Giant ionic structures | I can state that ionic compounds have high melting points and can dissolve in water. | ☐ | I can explain why ionic compounds have a high melting point. | ☐ | I can explain in detail why ionic compounds cannot conduct electricity when they are solid but can when molten or in solution. | ☐ |
| | I can state that ionic compounds can conduct electricity when molten or dissolved in water. | ☐ | I can describe, in terms of ions, how an ionic compound can conduct electricity. | ☐ | I can justify in terms of properties that a compound has ionic bonding. | ☐ |
| | I can describe an ionic lattice. | ☐ | I can explain the movement of ions in solutions or when molten. | ☐ | I can apply the ionic model to make predictions of the physical properties of ionic compounds. | ☐ |
| C3.5 Covalent bonding | I can describe a covalent bond. | ☐ | I can explain how a covalent bond forms in terms of electronic structure. | ☐ | I can draw dot and cross diagrams and ball and stick diagrams for unfamiliar small molecules. | ☐ |
| | I can recognise a covalent compound from its formula, name, or diagram showing bonds. | ☐ | I can draw dot and cross diagrams and ball and stick diagrams for H2, Cl2, O2, N2, HCl, H2O, NH3, and CH4. | ☐ | I can suggest how double and triple covalent bonds can be formed. | ☐ |
| | I can name familiar examples of small molecules which contain covalent bonds. | ☐ | I can describe a double bond in a diatomic molecule. | ☐ | I can suggest how the properties of a double bond could be different to the properties of a single covalent bond. | ☐ |

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| C3.6 Structure of simple molecules | I can state that small molecules have low melting and boiling points. | ☐ | I can explain how the size of molecules affects melting and boiling points | ☐ | I can predict the physical properties of unfamiliar covalently bonded substances. | ☐ |
| | I can state that small molecules do not conduct electricity. | ☐ | I can explain why small molecules and polymers do not conduct electricity. | ☐ | I can compare and contrast the properties of substances with different bonding. | ☐ |
| | I can describe an intermolecular force. | ☐ | I can identify substances that would have weak intermolecular forces. | ☐ | I can justify the use of a model to explain the physical properties of a small molecule and discuss the limitations of various molecular models. | ☐ |
| C3.7 Giant covalent structures | I can list the main physical properties of diamond and graphite. | ☐ | I can recognise the structure of diamond and graphite from information provided in written or diagrammatic form. | ☐ | I can use a molecular model of an unfamiliar giant covalent structure to predict and explain is physical properties. | ☐ |
| | I can state that giant covalent structures have high melting points. | ☐ | I can explain the properties of diamond in terms of its bonding. | ☐ | I can justify in detail a use for graphite based on its properties. | ☐ |
| | I can describe the structure of graphite in terms of layers of carbon atoms. | ☐ | I can explain the properties of graphite in terms of its bonding. | ☐ | I can justify in detail a use for diamond based on its properties. | ☐ |
| C3.8 Fullerenes and graphene | I can describe the relationship between graphite and graphene. | ☐ | I can recognise the structure of a fullerene or nanotube in diagrams and prose. | ☐ | I can describe and explain the applications of fullerenes. | ☐ |
| | I can list the main physical properties of fullerenes. | ☐ | I can explain the structure of fullerenes. | ☐ | I can use molecular models of graphene, nanotubes, and fullerenes to explain their properties. | ☐ |
| | I can state the molecular formula of buckminsterfullerene. | ☐ | I can list the properties and consequent uses of fullerenes and carbon nanotubes. | ☐ | I can justify in detail a use for graphene, nanotubes and fullerenes, based on their properties. | ☐ |

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| C3.9 Bonding in metals | I can state that metals form a giant structure. | ☐ | I can describe metallic bonding. | ☐ | I can explain how metal atoms form giant structures. | ☐ |
| | I can recognise metallic bonding in diagrams. | ☐ | I can recognise and represent metallic bonding diagrammatically. | ☐ | I can evaluate different models of metallic bonding. | ☐ |
| C3.10 Giant metallic structures | I can list the physical properties of metals. | ☐ | I can explain key physical properties of metals using the model of metallic bonding. | ☐ | I can explain in detail, including labelled diagrams, how alloying affects the structure and bonding in metals and its effect on properties. | ☐ |
| | I can describe the structure of a pure metal. | ☐ | I can describe why metals are alloyed. | ☐ | I can justify in detail why alloys are more often used than pure metals. | ☐ |