

C5.1 Pre-Unit Quiz: Carbon Chemistry

Mark Scheme

Qu	Answer	Marks	Supporting information for fix-it tasks
1	C	1	<p>Answering A suggests that the student might associate the number of shells with the group number, instead of the period number.</p> <p>Answering B suggests that the student might associate the number of electrons with the group number.</p> <p><i>To fix it, give students some electronic configuration diagrams and ask them to identify the element in the Periodic Table, and then to write down the period and group number of that element.</i></p>
2	B	1	<p>Answering A shows students have confused compounds and mixtures, which is a common error.</p> <p>Answering C shows that students have confused compounds and molecules or assumed that they are synonymous.</p> <p><i>To fix it, review the definitions of compound, mixture and molecule and give students examples and non-examples to refer to. For example, hydrogen gas is a molecule but not a compound and sodium chloride is a compound but not a molecule.</i></p>
3	C	1	<p>Answering A shows that students are not clear on the meaning of a molecule, which is a key definition for this unit.</p> <p>Answering B shows that students have confused ionic bonding with molecules.</p> <p><i>To fix it, give students examples and non-examples to refer to. For example, hydrogen gas is a molecule but not a compound and sodium chloride is a compound but not a molecule.</i></p>
4	A	1	<p>Answering B shows students have confused covalent and ionic bonding.</p> <p>Answering C shows that students have a misconception that an element cannot contain bonds.</p> <p><i>To fix it, review the definition of a covalent bond and show students how elements can be diatomic and contain bonds.</i></p>
5	B	1	<p>Answering A shows students have confused covalent and ionic bonding.</p>



			<p>Answering C shows that students have a misconception that metallic bonding occurs between metals and non-metals.</p> <p><i>To fix it, review each different type of bonding and give students examples and non-examples, then plenty of practice identifying the type of bonding from given formulae.</i></p>
6	A	1	<p>Answering B or C means students are mixing up ionic, covalent and metallic bonding.</p> <p><i>To fix it, provide a diagram or model for each type of bonding and explain to students why bonding occurs in each. Ask students to explain this in their own word, and encourage their use of the correct terminology.</i></p>
7	C	1	<p>Answering A, B or D suggests that students cannot recall which atoms make up diamond.</p> <p><i>To fix-it, show students a diagram of diamond and label the key features. Ask students to do the same with a blank diagram.</i></p>
8	A	1	<p>Answering B suggests a gap in knowledge about how many electrons are in the 2nd electron shell.</p> <p>Answering C suggests a misconception that the 2nd electron shell can hold 8 electrons so does always hold 8 electrons.</p> <p><i>To fix it, reteach the rules of writing out electronic configuration and then give many practice questions.</i></p>
9	B	1	<p>Answering A suggests some understanding that a full outer shell/stable configuration causes noble gases to be unreactive, but shows a gap in knowledge that helium has only two electrons in its outer shell. <i>To fix it, ask students to draw out the electronic configuration of helium, neon and argon.</i></p> <p>Answering C suggests that students have the misconception that a stable electron arrangement is an atom being electrically neutral. <i>To fix it, show diagrams of different types of atom, where they have equal numbers of protons and electrons, but do not have a full outer shell.</i></p>
10	B	1	<p>Answering A or C suggests that students are confusing the term polymer with plastic or an example of a plastic (such as a thermosoftening plastic).</p> <p><i>To fix it, support pupils to define the term polymer with some examples, and then differentiate this with some specific examples of plastic, such as thermosoftening and thermosetting plastics.</i></p>