

**YEAR 9**

Atomic Structure and the Periodic Table

Three sections. Answers in section A and C are short written answers; write in full sentences where the question asks you to explain.

A. Inside the atom

- 1 Where in the atom are the protons and neutrons found? **In the nucleus**
- 2 What is the relative charge on a proton? **+1**
- 3 What is the relative charge on an electron? **-1**
- 4 What is the relative charge on a neutron? **0**
- 5 Which particle has a relative mass so small it is treated as zero? **The electron**
- 6 Explain why an atom has no overall charge. **It has equal numbers of protons and electrons, so the charges cancel**
- 7 What does the atomic number of an element tell you? **The number of protons**
- 8 What does the mass number tell you? **The number of protons plus neutrons**

B. Counting the particles

- 9 Sodium has atomic number 11 and mass number 23. Give its protons, neutrons and electrons. **11 protons, 12 neutrons, 11 electrons**
- 10 Chlorine has atomic number 17 and mass number 35. Give its protons, neutrons and electrons. **17 protons, 18 neutrons, 17 electrons**
- 11 Carbon has atomic number 6 and mass number 12. Give its protons, neutrons and electrons. **6 protons, 6 neutrons, 6 electrons**
- 12 Oxygen has atomic number 8 and mass number 16. Give its protons, neutrons and electrons. **8 protons, 8 neutrons, 8 electrons**
- 13 Magnesium has atomic number 12 and mass number 24. Give its protons, neutrons and electrons. **12 protons, 12 neutrons, 12 electrons**

- 14 Potassium has atomic number 19 and mass number 39. Give its protons, neutrons and electrons. **19 protons, 20 neutrons, 19 electrons**
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- 15 An atom has 20 protons and 20 neutrons. What is its mass number? **40**
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- 16 Two atoms both have 6 protons. One has 6 neutrons and one has 8. What word describes them? **Isotopes**
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C. Reading the table

- 17 What does the group number tell you about a main-group element? **How many electrons are in its outer shell**
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- 18 What does the period number tell you? **How many electron shells the atom has**
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- 19 How many electrons fill the first shell? **2**
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- 20 How many electrons fill the second shell? **8**
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- 21 Write the electron arrangement of a sodium atom, which has 11 electrons. **2, 8, 1**
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- 22 Write the electron arrangement of a chlorine atom, which has 17 electrons. **2, 8, 7**
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- 23 What is the common name for the Group 1 elements? **The alkali metals**
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- 24 What is the common name for the Group 7 elements? **The halogens**
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- 25 Explain why the Group 0 elements are unreactive. **Their outer shell is already full, so they have no need to gain, lose or share electrons**
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