

**AQA, OCR, Edexcel**

**GCSE Science**

# **GCSE Chemistry**

## **The Structure of an Atom Answers**

Includes:

Relative electrical charges of subatomic particles

Size and mass of atoms

Relative atomic mass

Electronic Structure

**M M E**

**Mathsmadeeasy.co.uk**

**Total Marks: /46**

**Relative electrical charges of subatomic particles**

Q1: What are the relative charges of the particles in the atom?

- Proton: +1 (1 mark)
- Neutron: 0 (1 mark)
- Electron: -1 (1 mark)

(3 marks)

Q2: If there are 6 protons in the nucleus of an atom, how many electrons are in the atom?

6 electrons.

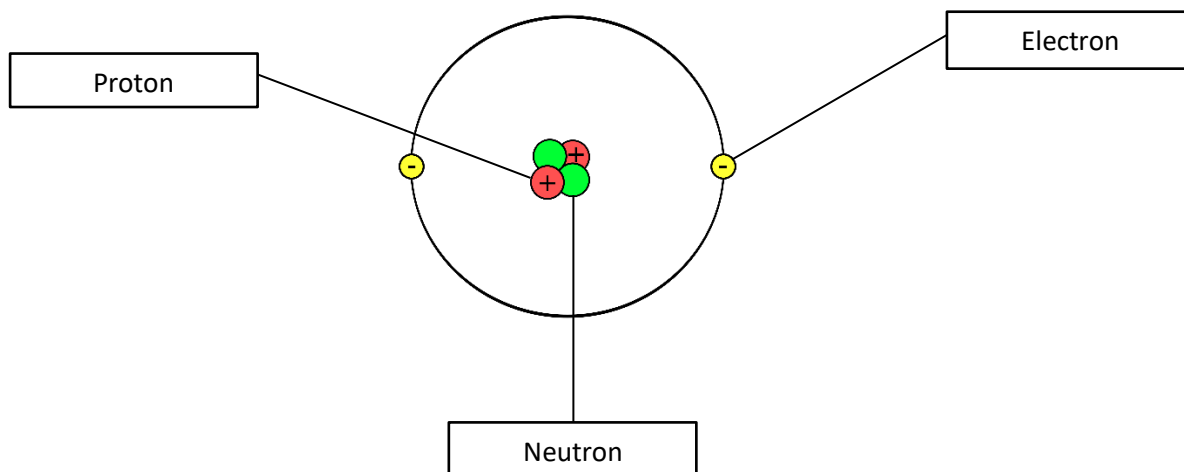
(1 mark)

Q3: Magnesium's atomic number is 12. How many protons and electrons does it have?

- Protons: 12
- Electrons: 12

(2 marks)

Q4: Label the diagram.



(3 marks)

**Size and mass of atoms**

Q5: Where is almost all the mass in an atom?

The nucleus.

(1 mark)

Q6: Fill in this table for the relative masses of parts of the atom.

Name of particle	Relative mass
Proton	1
Neutron	1
Electron	0 or 1/2000

(3 marks)

Q7: What is an atom's mass number?

A= The sum of the protons and neutrons. (1 mark)

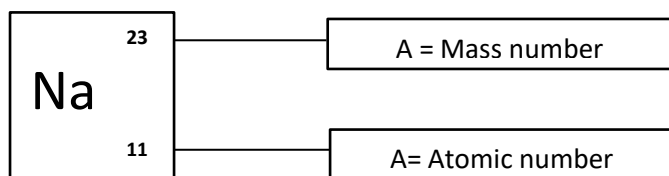
(1 mark)

Q8: Define what is meant by the term isotope.

A= Atoms of the same element (1 mark) that have different numbers of neutrons (1 mark).

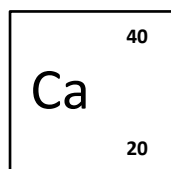
(2 marks)

Q9: Label the diagram for what each number represents in the periodic table.

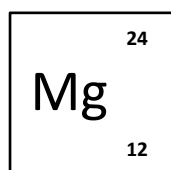


(2 marks)

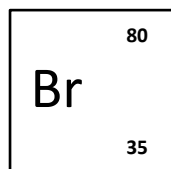
Q10: For the following elements. State the number of protons, electrons and neutrons.



Protons: 20  
Neutrons: 20  
Electrons: 20



Protons: 12  
Neutrons: 12  
Electrons: 12



Protons: 35  
Neutrons: 45  
Electrons: 35

(9 marks)

**Relative atomic mass**

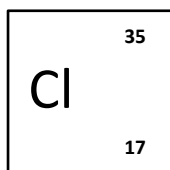
Q11: Define *relative atomic mass*.

A= The average value (1 mark) that takes into account the abundance of the isotopes of the element (1 mark).

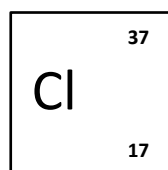
(2 marks)

Visit <http://www.mathsmadeeasy.co.uk/> for more fantastic resources.

Q12: Chlorine is present as two isotopes. Calculate its *relative atomic mass*, with the following information. You must show your working.



76% of chlorine.



24% of chlorine.

$$\text{Relative atomic mass} = \frac{\text{total mass of atoms}}{\text{total number of atoms}}$$

Therefore:

$$\begin{aligned} \text{Relative atomic mass} &= \frac{(35 \times 76) + (37 \times 24)}{76 + 24} \\ &= \frac{2660 + 888}{100} \end{aligned}$$

35.5

No marks for simply stating the answer from memory

(4 marks)

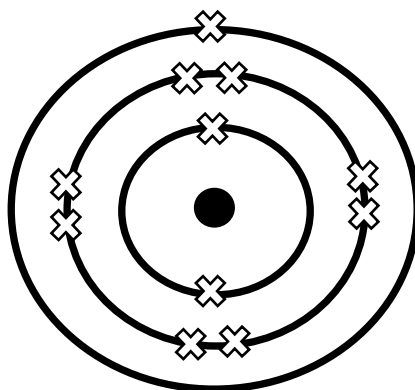
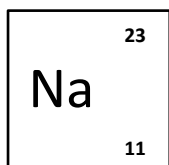
**Electronic Structure**

Q13: Explain how electrons arrange themselves in an atom?

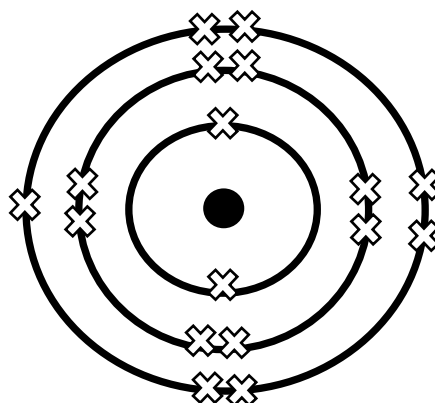
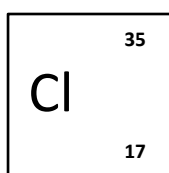
A= The electrons occupy energy levels or shells (1 mark). They occupy the lowest energy level first (1 mark). 2 electrons can occupy the first, and 8 thereafter (1 mark).

(3 marks)

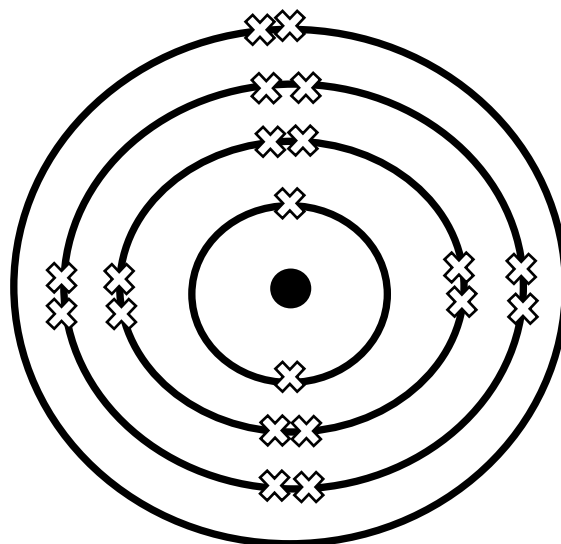
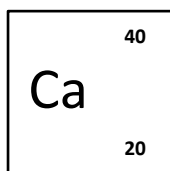
Q14: For the following elements, state the number of electrons. Then, draw a diagram to represent the arrangement of electrons.



(3 marks)



(3 marks)



(3 marks)