

Physical properties of group 1 elements

1. **Copy** the table below into your book and **complete** it (parts have been done for you already).

Element	Symbol	Atomic number	Density (g/cm ³)	Melting point (°C)	Boiling point (°C)	State at 25°C	State at 100°C
lithium		3	0.53	181	1342		
sodium			0.97	98	883		
potassium			0.86	63	760		liquid
rubidium			1.53	39	684		
caesium	Cs		1.88	29	669	solid	

2. Water has a density of 1g/cm³. If an object has a density greater than this, it will sink.

- Which group 1 elements will float on water, and which will sink?
- What can you say, in general, about the densities of the group 1 metals?

3. Aluminium melts at 660°C and iron melts at 1535°C.

What can you say about the melting points of the group 1 elements compared to other metals, such as these two?

4. Plot a graph of melting point (vertical axis) against atomic number (horizontal axis). Remember to:

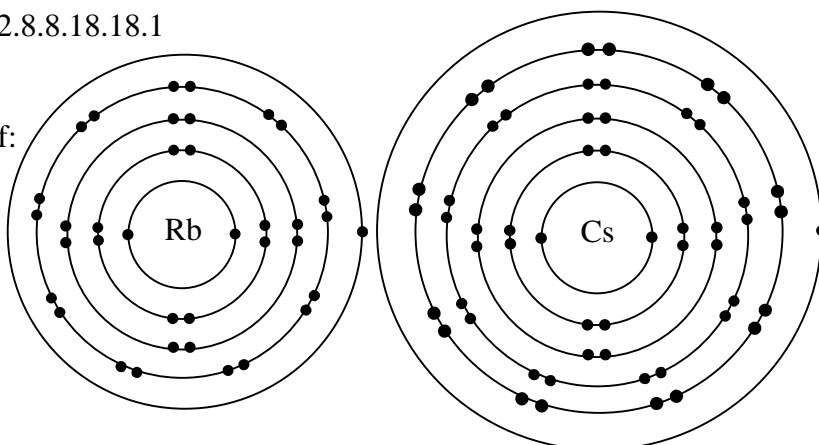
- use a sharp pencil to draw your graph;
- give it a title;
- label your axes; and
- connect the points with a smooth curve.

Describe your graph in a much detail as you can – what does it show you about how the melting points of the group 1 metals change as the atomic number increases?

5. The electron arrangement of rubidium is 2.8.8.18.1
The electron arrangement of caesium is 2.8.8.18.18.1
(the electron diagrams are on the right).

Write down the electron arrangements of:

- lithium,
- sodium,
- potassium,
- rubidium, and
- caesium.



- What do the five electron arrangements in question 5 have in common?
- What do you notice about the distance of the outermost electron from the nucleus as you go down group 1?
- The further away the outer electron is from the nucleus, the easier it is to remove. Why do you think this might be?