

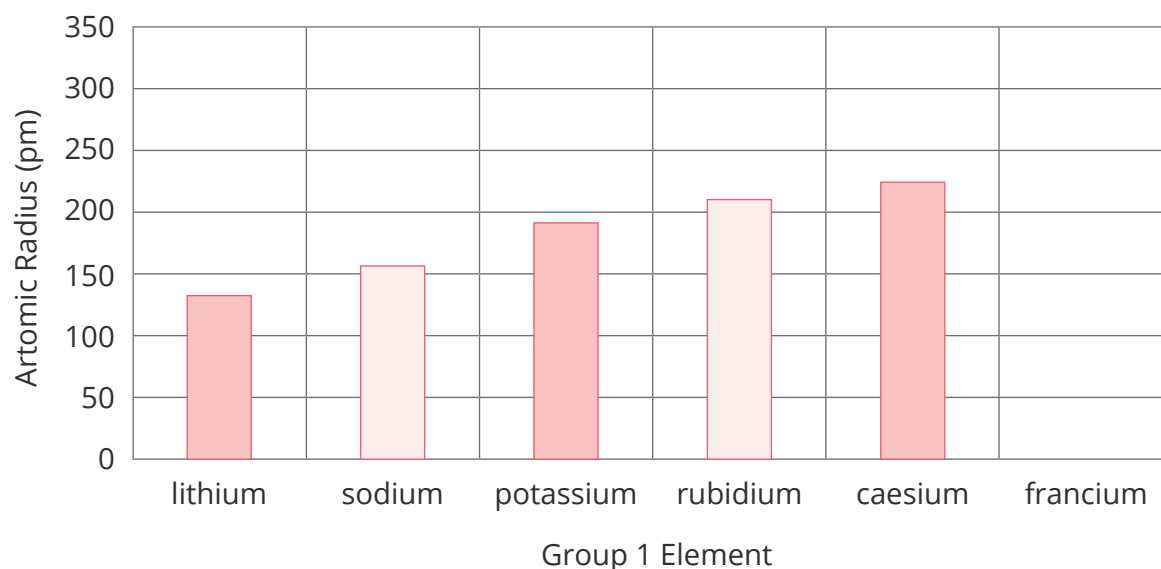


Trends in Group 1 Elements

The alkali metals are found in Group 1 of the periodic table.

1	2											3	4	5	6	7	0
																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts	Og

The graph shows the radius of an atom of each alkali metal. The bar for francium is missing.



1. Complete the sentence to describe the trend in the size of the atoms of the alkali metals.

As you move down Group 1 the radius of the atoms _____.

2. Draw a bar on the graph to predict the radius of a francium atom.

The table shows the melting and boiling points for the alkali metals.

Element	Melting Point (°C)	Boiling Point (°C)
lithium	180	1342
sodium	98	883
potassium	64	759
rubidium	39	
caesium	29	671
francium	27	677

3. Why are the alkali metals solid at room temperature?

Tick **one** box.

☐

Their melting points are higher than room temperature.

☐

Their melting points are lower than room temperature.

☐

Their boiling points are lower than room temperature.

☐

Because metals are always solid.

4. Predict the boiling point of rubidium.

_____ °C

The table shows what happens when some alkali metals are added to water.

Element	Observations
lithium	It floats on the water and fizzes, gradually becomes smaller until it disappears.
sodium	It fizzes rapidly and melts to form a ball that moves about on the surface of the water. The ball gets smaller quickly and disappears.
potassium	It melts and moves quickly around the surface of the water and gives off sparks and a violet flame. It disappears rapidly, sometimes with a small explosion.

5. Predict how rubidium would behave if added to water.

Tick **one** box.

☐

It melts quickly, shoots across the water and disappears.

☐

It melts quickly and burns with a violent flame, then disappears in a violent explosion.

☐

It fizzes slowly and gradually disappears over a few minutes.

☐

It fizzes rapidly and melts. It sets alight as it disappears.

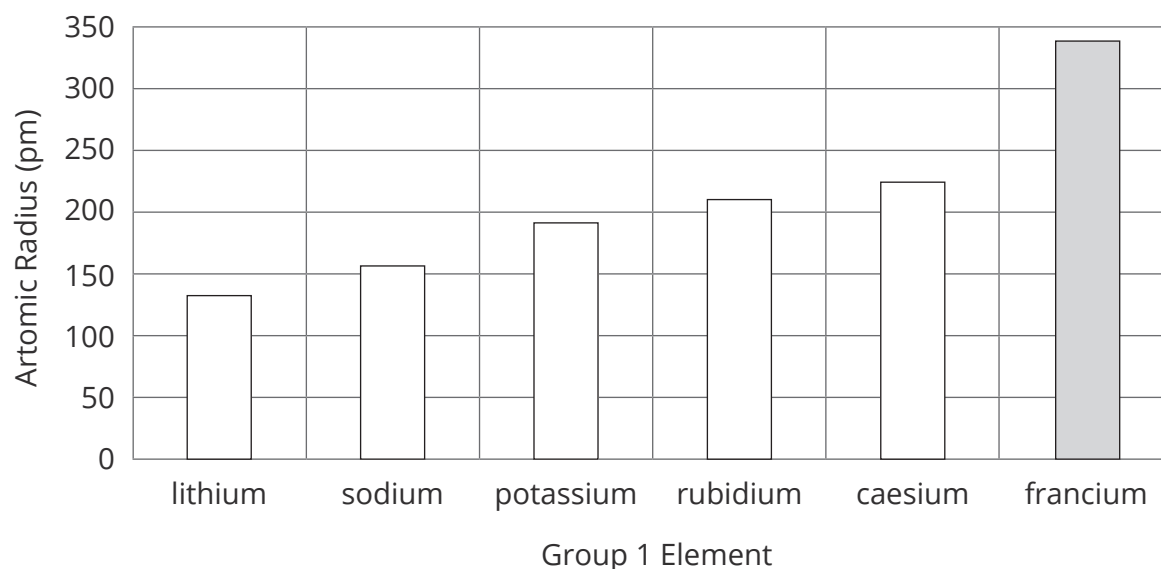


Trends in Group 1 Elements **Answers**

The alkali metals are found in Group 1 of the periodic table.

1	2											3	4	5	6	7	0
																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts	Og

The graph shows the radius of an atom of each alkali metal. The bar for francium is missing.



1. Complete the sentence to describe the trend in the size of the atoms of the alkali metals.

As you move down Group 1 the radius of the atoms **increases**.

2. Draw a bar on the graph to predict the radius of a francium atom.

Allow any bar drawn on graph that is taller than the bar for caesium.

The table shows the melting and boiling points for the alkali metals.

Element	Melting Point (°C)	Boiling Point (°C)
lithium	180	1342
sodium	98	883
potassium	64	759
rubidium	39	
caesium	29	671
francium	27	677

3. Why are the alkali metals solid at room temperature?

Tick **one** box.

☒

Their melting points are higher than room temperature.

☐

Their melting points are lower than room temperature.

☐

Their boiling points are lower than room temperature.

☐

Because metals are always solid.

4. Predict the boiling point of rubidium.

670 – 758 °C

Allow any temperature between these values.

The table shows what happens when some alkali metals are added to water.

Element	Observations
lithium	It floats on the water and fizzes, gradually becomes smaller until it disappears.
sodium	It fizzes rapidly and melts to form a ball that moves about on the surface of the water. The ball gets smaller quickly and disappears.
potassium	It melts and moves quickly around the surface of the water and gives off sparks and a violet flame. It disappears rapidly, sometimes with a small explosion.

5. Predict how rubidium would behave if added to water.

Tick **one** box.

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It melts quickly, shoots across the water and disappears.

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It melts quickly and burns with a violent flame, then disappears in a violent explosion.

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It fizzes slowly and gradually disappears over a few minutes.

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It fizzes rapidly and melts. It sets alight as it disappears.