



- 1 Carry out the following instructions using the group 0 data cards on page 2 of this worksheet.
 - A Cut out all the data cards for atomic radius.
 - B Place the data cards in order of increasing atomic radius.
 - C Place the card for xenon where you think it fits in the order.
 - D Check the order of your cards with your teacher.
 - E Glue the cards onto a sheet of paper.
 - F Repeat steps **A–E** using the data cards for: relative atomic mass, boiling point, density.
- 2 Describe the trends that can be seen in the four properties for the group 0 elements.
- 3 Draw a scatter graph of atomic number (horizontal axis) against boiling point (vertical axis) and use a line of best fit to predict the missing data for xenon (write your prediction on the card).
- 4 Choose one more of the properties from question 1 to draw a scatter graph. Atomic number should be on the horizontal axis and use a line of best fit on your graph to predict the missing data for xenon (write your prediction on the card).
- 5 State which of your predictions you expect to be the most accurate. Explain your choice with reference to the scatter graphs you used.
- 6 Find the actual values of the missing data for xenon. Compare these with your predicted values and comment on the accuracy of your predictions.



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18 Ar argon atomic radius 71 pm	18 Ar argon relative atomic mass 40.0	18 Ar argon boiling point –186 °C	18 Ar argon density 0.0018 g cm ^{–3}
2 He helium atomic radius 31 pm	2 He helium relative atomic mass 4.0	2 He helium boiling point –269 °C	2 He helium density 0.0002 g cm ^{–3}
36 Kr krypton atomic radius 88 pm	36 Kr krypton relative atomic mass 83.8	36 Kr krypton boiling point –152 °C	36 Kr krypton density 0.0037 g cm ^{–3}
10 Ne neon atomic radius 38 pm	10 Ne neon relative atomic mass 20.2	10 Ne neon boiling point –246 °C	10 Ne neon density 0.0009 g cm ^{–3}
54 Xe xenon atomic radius ?	54 Xe xenon relative atomic mass ?	54 Xe xenon boiling point ?	54 Xe xenon density ?