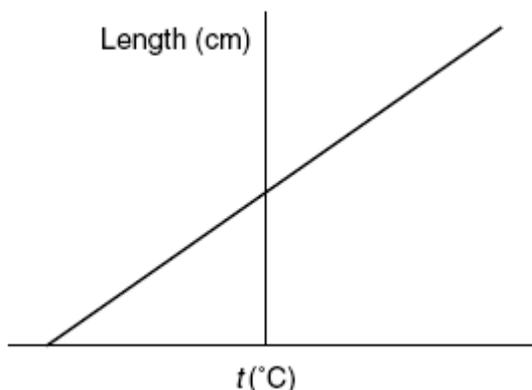


Investigation 3.B: The Relationship between Temperature and Volume of a Gas Answer Key

Answers to Analysis Questions

1. The manipulated variable is the temperature. The responding variable is the length of the column of gas below the water slug (proportional to volume). Two control variables would be the pressure and cross-sectional area inside the pipette.
2. Graphs should be approximately linear but with some scatter.



3. The x -intercepts will vary quite a bit. Ideally, the x -intercepts should be between $-300\text{ }^{\circ}\text{C}$ and $-250\text{ }^{\circ}\text{C}$.
4. The data suggest two things. First, the relationship between temperature and volume is linear. Second, if the temperature scale starts with zero at the x -intercept, then the relationship is a direct one.
5. You might infer that, due to kinetic molecular theory, there would be a temperature at which the molecules of gas no longer collide with the container and therefore exert no volume.

Answer to Conclusion Question

7. The volume of gas varies directly with the absolute temperature of the gas.