

**Gas Laws: Charle’s, Boyle’s, and Avogadro’s Laws.**

**Chemical available:** None

**Materials for demonstration provided in kit:**

 Balloons,

tongs ,

small bottle with stopper

gloves (to protect against cold),

goggles (for safety).

Large plastic syringe

Pressure gauge

**Materials used for multiple demos to add in**:

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Lab quest for reading out pressure gauge.

**Materials you must grab immediately before:**

Liquid Nitrogen

**Procedure for in class demo**:

Use balloons to quickly and simply show Avogadro’s law with relation to volume (i.e. 1 breath equals smaller balloon than 2 breaths).

Use bottle and stopper to show avogadros law with relation to pressure (i.e. as the CO2 sublimates moles increase and stopper “explodes” out of the bottle. (safety note: don’t put it on too tight)

Use room temperature balloon placed in liquid nitrogen to show Charles law (i.e. as the balloon cools it shrinks). (Tip: usually I pre-shrink one or two balloons of the same color to speed the process up).

Use large plastic syringe with pressure gauge on document camera to show increase in pressure as volume is decreased.

**Waste:** none. (Throw used balloons away, please save the syringe).

**Slides available**: Yes