

# HEAT DEMOS

- Extreme Expansion
  - Making Hydrogen from Hydrochloric Acid + Zinc  $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2(\text{g})$
  - Making Oxygen from Hydrogen Peroxide (with the catalyst Yeast)  $2\text{H}_2\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{O}_2(\text{g})$
  - Hydrogen + Oxygen  $2\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{H}_2\text{O}(\text{g})$
  - Propane + Oxygen Balloon  $\text{C}_3\text{H}_8(\text{g}) + 5\text{O}_2(\text{g}) \rightarrow 3\text{CO}_2(\text{g}) + 4\text{H}_2\text{O}(\text{g})$
- Multi-Jet Oxy Propane Melting Glass
- Burning Alcohols
  - Isopropyl  $\text{C}_3\text{H}_8\text{O}$
  - Methyl  $\text{CH}_3\text{OH}$
  - Ethyl  $\text{C}_2\text{H}_5\text{OH}$
- Burning Wax  $\text{C}_n\text{H}_{2n+2}$
- Tyndall's Experiment
- Ping Pong Ball in boiling water
- Bimetallic Strip
- Red Hot Steel
- Hot Marble in cold water
- Silver & Black Cans cooling down hot water
- Extreme Cold: *Nitro Cream (see Liquid Nitrogen below)*
- 3 Bowls of hot, cold, and lukewarm water
- Regelation of Ice
- Ice Bomb
- Yellow & Blue water mixing to green
- Boiling water next to an ice cube
- Radiating Heat through Glass
- Radiating Heat through a Vacuum
- Temperature in a Vacuum
- Triple Point in a Vacuum
- Extreme Crush of a Vacuum in an emptying container
- Extreme Crush of a Vacuum - cooling an aluminum soda can that had boiling water in it
- Rain - invert, then squirt flask that had boiling water to create vacuum, hence fountain of rain
- Race of Conduction - 3 drops of wax in succession on a metal rod
- Race of Conductors - 3 drops of wax on 3 different metal rods
- Hand Boilers
- Drinking Bird
- HYPO Snowfall – sodium thiosulfate
- Homemade Thermometer
- Homemade Barometer from Blown Glass
- Expanding Pendulum
- Weights of hot and cold air on homemade balance
- Weights of hot and cold water on laboratory balance
- Stress Friction on Hangar
- Boiling Water in a paper cup from an open flame
- Water Balloon - put a match to it
- Heat of Vaporization of Water
- Heat of Fusion of Naphthalene
- Specific Heat of different objects cause different rise in temperature

- Sublimation of Dry Ice
- Salt Water (just a pinch) Boils greater than 100°
- [Homemade Blinker from Bimetallic Strip](#)
- Egg pulled into bottle from vacuum
- Hero's Steam Engine

- Liquid Nitrogen
  - MATERIALS
    - Cooked Ice Cream Mix:
      - 3 cups heavy cream, 1 cup milk, 3/4 cup sugar, 4 eggs, 1 Tbs vanilla
    - lettuce or spinach
    - potato chips with ridges
    - 4 eggs
    - whisk
    - marshmallows
    - hot water
    - thermos, gloves, tongs, slotted spoon, paper towels
    - hammer
    - lab coats & goggles
    - flask
    - balloons
    - big bowl, whisk, slotted spoon
    - mat, cloth insulator
    - plastic cups & spoons
    - small water bottle
    - bimetallic strip
    - chalk
  - DEMOS
    1. Pour into Thermos
      - a. Pour into soapy water
      - b. Pour into hot water
      - c. Ping pong w/pinhole
      - d. Bimetallic strip
      - e. Chalk Hovercraft
      - f. Pour Nitro over Raw Egg - broken in pan ('fried') & whole hammered
    2. Pour into Big Bowl
      - a. Balloons - shrink & expand
      - b. Dip Lettuce or Spinach
      - c. Marshmallows - eat little marshmallows - break big marshmallow
    3. Explode bottle in a barrel
    4. **NitroCream**