**Can Crusher**

**Science Concept: Pressure. Molecular movement and change of phase.**

Air pressure causes the Aluminum can to crush.

**Materials:**

\*Aluminum soda can

\*Hot plate, or hot stove

\*Large beaker of ice cold water

\*Beaker tongs or hot pad holder

\*Safety goggles

**Directions:**

\*Fill large beaker with ice cold water.

\*Pour 20 mL water into the pop can.

\*Place pop can with the water on the hot plate.

\*Let can stay on the hot plate until the water inside begins to boil. You must see steam coming out of the can for this to work.

\*When water begins to boil, quickly pick up can with tongs on the bottom of the can, and place can upside down into the cold water.

**Introduction:**

How many of you like watching a pop can shrivel up without having to crush it yourself? Here is a better way of crushing cans the easy way.

**Explanation:**

When water boils, it produces steam which is actually very tiny droplets of liquefied water. We are really interested in the idea that boiling water produces water molecules in the gas state which are invisible. The water gas molecules occupy all of the space in the can since the air molecules have been pushed out. The hot gas molecules in the can are at the same pressure as the air on the outside of the can.

Graphic of [**model gas molecules behavior**](http://www.elmhurst.edu/~chm/demos/images/cancrusher2.GIF)

When the can is put in the cold water upside down, the hot gas water molecules are very rapidly cooled. Some of the gas molecules are condensed back to the liquid water, so there are less gas molecules present. Cold water also cools the remaining gas molecules, which makes the molecules slow down, then there are fewer collisions with the walls of the can, which in turn causes less pressure inside of the can. The air pressure on the outside of the can is stronger. This causes the can to crush.

Higher air pressure on the outside of the can is the main reason for the can crushing.

Real Life Demo of [Railroad Tank Car Crushed.](http://www.delta.edu/slime/cancrush.html)

**Reference:** In the Public Domain.

http://www.elmhurst.edu/~chm/demos/CanCrusher.html