Expansion and Contraction in Materials by Heating and Cooling

All metals expand when heated and contract when cooled.

When heated, if there is an increase in the volume of a substance, then the process is known as expansion. Again, when cooled, if there is a decrease in the volume of a substance, then the process is called contraction.



Silicone beads cushion the planks to reduce noise that results from normal contraction

Expansion and Contraction in Liquids

When the particles in a liquid are heated, their average energy increases and they need more room, so they expand.

When the particles in a liquid are cooled, as result the volume decreases, or contracts due to the particles need less room. This is demonstrated by the liquid used in a thermometer. As the liquid expands and contracts, it moves up and down the inside tubing of the thermometer.



Expansion and Contraction in Gases

When the particles in a gas are heated, their average energy increases and they need more room, so they expand.

When the particles in a gas are cooled, the volume decreases, or contracts, because the particles need less room.

Under extremely high temperature conditions (like the temperatures inside the Sun, particles can be split into what makes them up (electrons and ions). This creates a fourth state of matter called plasma.

