

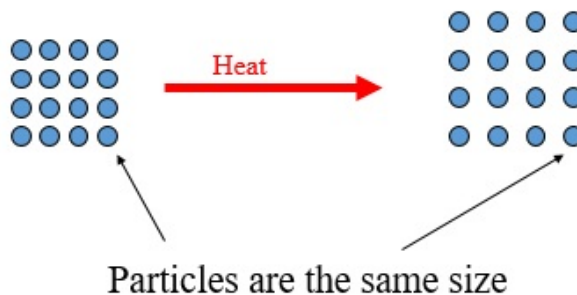
Intermediate Science 7
Unit 1: Heat and Temperature
Topic 6: Expansion and Contraction Of Matter



Student Name _____

Expansion:

- When solids, liquids, and gases are heated, their volumes usually increase.
- Heating a substance speeds up its particles, so they have more kinetic energy.
- The faster-moving particles travel greater distances, so they occupy more space.
- The particles in a substance do not expand themselves



When materials _____, the particle model of matter says the particles move _____ and _____. It _____, and there is an _____ in volume as temperature increases Occurs when heat is transferred to _____.

Contraction

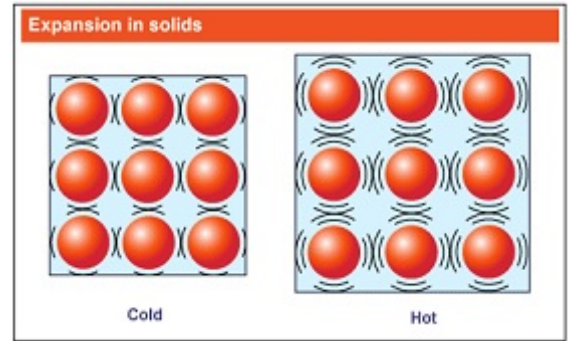
- When solids, liquids, and gases are cooled, their volumes usually decrease
- Cooling a substance slows down its particles, so that they have less kinetic energy.
- The slower-moving particles travel shorter distances, so they occupy less space.



When materials _____, the particle motion is _____
Materials _____, or have a _____ in volume, as they cool.
Happens when heat is transferred from the _____ object to the _____ one

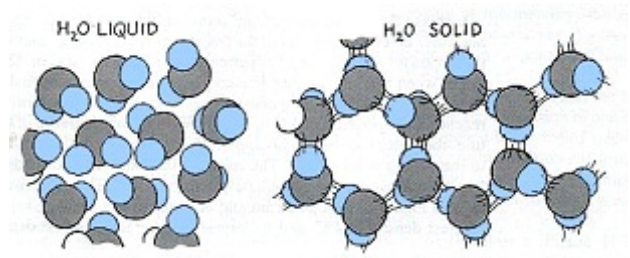
Expansion and Contraction of Solids

- Solids expand when heated
- Solids contract when cooled
- Solids expand at different rates



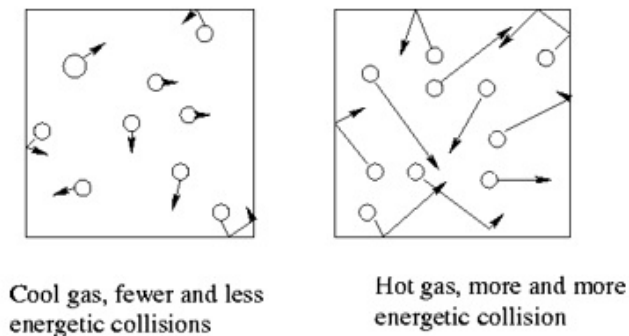
Expansion and Contraction of Liquids

- Liquids expand when heated and contract when cooled
- ONE EXCEPTION: WATER
- Water expands when cooled



Expansion and Contraction of Gases

- Gases expand when heated and contract when cooled
- If the temperature of a gas is reduced, the particles have less energy and move more slowly. Eventually, at a particular temperature, the particles stop moving completely. This temperature is the lowest possible temperature, and is known as absolute zero.



PART A: MULTIPLE CHOICE

Instructions: Shade the letter of the correct answer on the computer scorable answer sheet provided

1. When substance cools off there is a decrease in
 - (A) The volume of the substance
 - (B) Vibrations
 - (C) Temperature
 - (D) All of them
2. A metal ball which is passing through metal ring will not pass after
 - (A) Heating
 - (B) Freezing
 - (C) Constant conditions
 - (D) Accelerating

3. Expansion and contraction among solid, liquids and gases one which has greater tendency to expand is
 - (A) Gas
 - (B) Liquid
 - (C) Molten
 - (D) Solid

4. Small gaps are left between the metal rails on railway tracks in order to allow for ...
 - (A) Expansion of the metal rails on cold days
 - (B) Expansion of the metal rails on hot days
 - (C) Contraction of the metal rails on cold days
 - (D) Contraction of the metal rails on hot days

5. A solid expands when heated because the particles in the solid ...
 - (A) Become smaller and so push each other further apart
 - (B) Vibrate slower and so push each other further apart
 - (C) Vibrate faster and so push each other further apart
 - (D) Become larger and so push each other further apart

6. What is unusual about the way water behaves when it changes from a liquid to a solid?
 - (A) The water particles enlarge instead of shrinking
 - (B) It contracts instead of expanding
 - (C) The water particles shrink instead of enlarging
 - (D) It expands instead of contracting

7. Look at the experiment that the students set up to determine if a gas expands when heated. The experiment didn't work because the students were missing an important element to get the results they predicted. What was missing?
 - (A) Proper safety equipment
 - (B) A larger balloon
 - (C) A larger flask was needed
 - (D) Heat source



PART B: WRITTEN RESPONSE

1. How do the particles of a gas cause the volume of a container to increase when the temperature of the gas increases

2. Explain how a solid can expand while the individual particles in the solid always remain beside the same particles.

3. Give one reason why it is important for engineers who design buildings and bridges to understand expansion and contraction of materials.

4. On a winter day, the wind blows briskly all day. At the end of the day, you notice that there is much less snow on your driveway than there was in the morning. However, you did not see any moisture on the pavement all day. Explain what happened to the snow.
