

# Molecules on the Move Answers

## Answers:

**1. The punch you poured in the ice cube trays last night is a supply of popsicles today.**

The liquid punch froze overnight and turned into solid popsicles. Thermal energy was removed, and the semi-free-flowing molecules gathered into a repeating, rowlike pattern and slowed their motion to a vibration.

**2. You forgot to turn off the teakettle, and now the water is gone.**

When you forgot to turn off the teakettle, the liquid water continued to gain thermal energy. Keeping the water on the heat for so long caused it to evaporate from a liquid into a gas. Throughout this process, the molecules began to move faster and more freely.

**3. The cold, hard butter you spread on your toast is soft and runny.**

The heat from your warm toast began to melt the once solid butter into more of a liquid. This change in state allows the molecules in the butter to move more freely and adjust to the shape of the toast.

**4. The big ice cubes you put in your water are now tiny.**

The solid ice has begun to melt into liquid water. The vibrating molecules warmed up, moved more freely, and have started taking the shape of their container.

**5. The chicken soup has boiled for half an hour, and it seems to have “shrunk.”**

The chicken soup seems to have “shrunk” because some of the liquid inside the pot evaporated into a gas. Keeping the chicken soup boiling for that long allowed the molecules to move quickly and freely. There seems to be less liquid in the pot because the matter changed state into a gas.

**6. When you put the lid on the simmering soup, the inside of the lid gets all wet.**

When you put the lid on the simmering soup, the inside of the lid gets wet because of a change in thermal energy. The liquid within the pot continues to be heated causing the molecules to move more freely and with more speed. Eventually, some of the liquid in the pot begins to evaporate. This vapor makes the inside of the lid feel wet because it contacted a cooler surface, the lid, and condensed on it. The matter underwent another change in state.

**7. The wet sponge you left on the counter last night is dry this morning.**

As time went on, the sponge dried out. The liquid in the sponge evaporated into water vapor, a gas in the air. The molecules warmed and began to move more freely as a gas.

**8. Your little brother is crying because his snowman is shrinking.**

The solid snowman is shrinking because the snow is melting into a liquid, some of which will evaporate into a gaseous state. The heat from the sun causes the tightly packed, vibrating molecules in the snow to melt into water.

**9. Your mom hung your jeans outside on the clothesline, the temperature dropped below freezing, and now your jeans are cold, hard, and stiff.**

When your mom hung your solid jeans on the clothesline to dry, they were likely still a little damp. When the temperature dropped below freezing, the damp jeans started to freeze. The jeans are cold, hard, and stiff but not frozen solid! The molecules must have lined up even closer together and vibrated less in the frozen jeans than the damp ones.