

Point of View



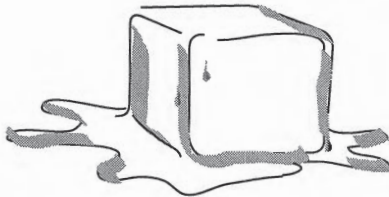
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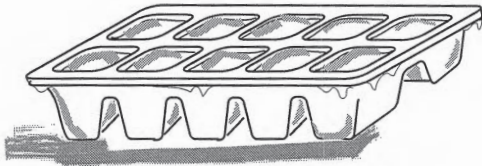
Purpose: In this lesson you will consider heat transfer from different points of view.

Examine the following diagrams and answer the questions:

Ice Cube Melting on a Counter Top:

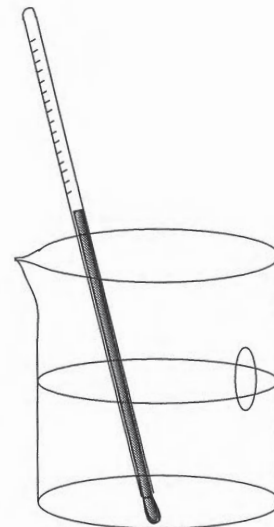
1. Draw arrows showing which direction heat is being transferred, into, or out of, the ice cube.
 2. Where exactly is the heat coming from?
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3. How are the molecules of H₂O in the puddle of water different from the molecules of water still in the solid ice cube?
 4. When the ice cube melts, is it releasing heat or taking heat from the environment?

Water Freezing in an Ice Cube Tray:

1. Draw arrows showing which direction heat is being transferred when the ice cube tray is placed in the freezer. Is heat being transferred into or out of the water as it freezes into ice?
 2. Is heat being transferred into or out of the air directly around the ice cube tray?
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3. In order to cool things in a refrigerator, heat must be transferred away from the food. Where do you think this heat ends up going?
 4. When the water is freezing, is it releasing heat or taking heat from the environment?

Making an NH₄Cl solution

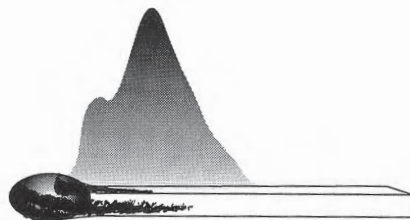
1. The temperature decreases when you prepare a solution of NH₄Cl. Draw arrows showing which direction heat is being transferred just after you prepare the solution. Include the direction of heat transfer between the solution and the thermometer.
2. What does your hand experience if it comes in contact with the solution?
3. Do you think this process would be used to create a cold pack to reduce swelling or a hot pack to increase circulation? Explain.



4. When the NH_4Cl dissolves, heat is absorbed yet the temperature decreases. How can this be?

Match Burning:

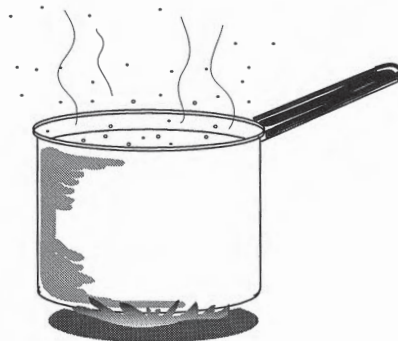
1. Draw arrows showing which direction heat is being transferred in the following situation.
2. What is the cause of the heat transfer in this particular situation?



3. Heat is released when a match burns, yet the temperature of the match increases. How can this be?

Boiling Water on the Stove:

1. Draw arrows showing which direction heat is being transferred in the following situation.
2. What is heating the water in the pot?
3. What temperature does the water, H_2O (l), reach? How do you know?
4. What happens to the temperature of the water vapor, H_2O (g), once it leaves the pot and condenses into steam? Explain.
5. Heat is required to boil the water, but the steam feels hot. How can this be?



Making sense:

In any situation with a heat transfer, heat is being absorbed by something and heat is being released by something else. Explain how this applies to cooking soup over a campfire. Include a diagram.

If you finish early...

Cold is a feeling but is not a “thing” that can be transferred from one place to another. Explain what this statement means.