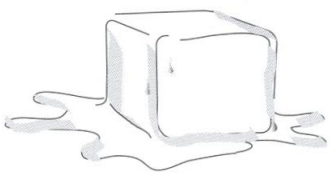
Worksheet- Heat Transfer During Phase Changes

Ice Cube Melting on a Counter Top:



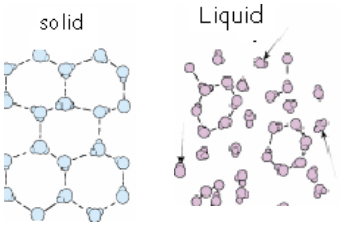
1. **Draw arrows** showing which direction heat is being transferred, into, or out of, the ice cube.

2. **Ice → Liquid**

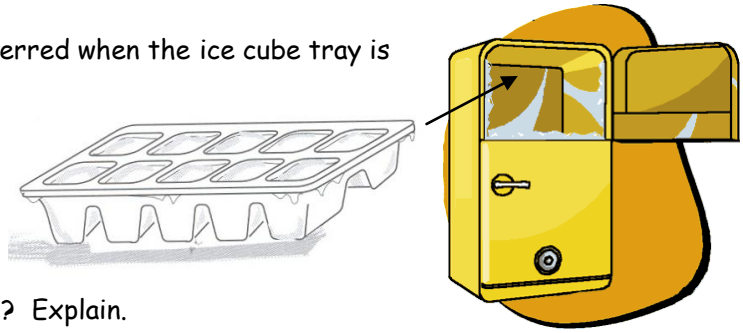
a) Is ice releasing heat or taking heat from the environment when it melts?

b) Is this process endothermic or exothermic for the ice? Explain.

3. What are 2 differences between the molecules of H_20 in the puddle of water different from the molecules of water still in the solid ice cube?



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.

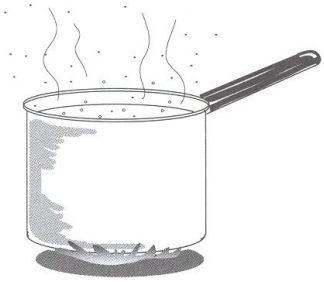
2. **Ice ← Liquid**

a) When water is freezing, is it releasing heat or taking heat from the environment?

b) Is this process endothermic or exothermic for the water? Explain.

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?

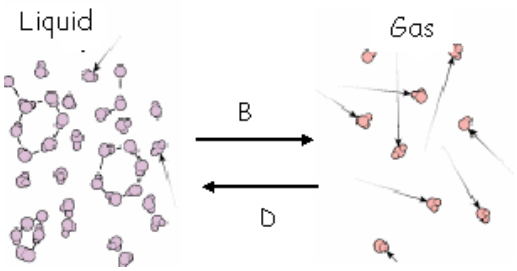
Boiling Water on the Stove:



1. **Draw arrows** showing which direction heat is being transferred in the image to the right. (Hint: it's going 2 different places)

2. What temperature does the water, H_20 (l), reach? How do you know?

3. What are 2 differences between the molecules of liquid water and water (gas)?



4. **Water (l) → Water (g)** (B on diagram)- is this process endothermic or exothermic? Explain.

5. **Water (l) ← Water (g)** is this process endothermic or exothermic? Explain.

6. When is it colder outside- While it's raining or after it rains? Explain using ideas from above.