



# Section 10.1

## Temperature Thermal Energy, and Heat

### Study Notes

By the end of section 10.1 you should be able to understand the following:

- The kinetic molecular theory states that the particles of matter are constantly in motion.
- Matter has thermal energy due to the kinetic and potential energy of its particles.
- "Heat" is the transfer of thermal energy.
- Thermal energy can be transferred by conduction, convection or radiation.

### NOTES

What is the kinetic molecular theory? What is kinetic energy? Sketch the particles of a solid, liquid and gas to illustrate the differences in kinetic energy.

1.

2.

3.

4.

5.

Define the "temperature" of a substance. What are the three number scales used to measure temperature?

1.

2.

3.

4.

5.

**Do the Reading Check on page 426**

## NOTES

What is "thermal energy"?  
What is the relationship between thermal energy and kinetic energy? Which has more thermal energy – a bowl of hot soup, or a bathtub full of warm water?

1.

2.

3.

What is potential energy?  
Thermal energy is the average kinetic energy + the average potential energy.  
What is the potential energy of a particle?

1.

2.

What heat?

1.

Describe the differences between the terms "temperature", "thermal energy" and "heat".

1.

2.

3.

Do the Reading Check on page 427

## NOTES

What are the three types of thermal energy transfer?

1.

2.

3.

Describe how thermal energy is transferred from one object to another in the process of thermal conduction. List one good thermal conductor, and one good thermal insulator.

1.

2.

3.

Describe how thermal energy is transferred by thermal convection. How is this different from conduction? Explain how a convection current works. Name one application of convection that is used in homes.

1.

2.

3.

4.

**Do the Reading Check on page 428**

**Do the Reading Check on page 430**

## NOTES

Describe how thermal energy is transferred from one object to another in the process of radiation. How is this different from conduction and convection? What are the two types of radiation you feel from the Sun's warm rays?

1.

2.

3.

4.

Earth receives solar radiation from the Sun, but where does the Earth's own thermal energy come from?

1.

2.

List one material that absorbs radiant thermal energy, one that reflects it, and one that transmits it.

1.

2.

3.