

Name KEY  
Chapter 5 Review Sheet

Date \_\_\_\_\_  
Thermal Energy and Heat

### Define Vocabulary

1. **Temperature:** The measure of the average KE of the particles in a substance.
2. **Thermal Energy:** The total KE and PE of the particles in an object.  
Depends on:
  1. The temperature of the object
  2. # of particles
  3. How particles are arranged.
3. **Absolute Zero:** The temperature at which no more energy can be removed from matter.
4. **Heat:** The transfer of thermal energy from a warmer object to a cooler object. Hot → Cold.
5. **Convection:** The transfer of thermal energy by the movement of a fluid (liquid or gas)
6. **Convection Current:** The movement of a fluid (liquid or gas) caused by differences in temperature, that transfers heat from one part of the fluid to another.
7. **Radiation:** The transfer of thermal energy through space as Electromagnetic waves.
8. **Conduction:** The transfer of thermal energy from one particle of matter to another by direct contact. (Solids)
9. **Conductor:** A material that conducts heat well. Allows heat to travel through it easily. (metals)
10. **Insulator:** A material that does not conduct heat well.
11. **Thermal Expansion:** The expansion of matter when it is heated.
12. **Specific Heat:** The amount of heat required to raise the temperature of 1 kg of a material by 1 Kelvin, which is equivalent to 1°C.

Convert the following temperatures:

12. 63 °C to 336 K

13. 49 °C to 322 K

14. 9 °C to 282 K

15. 670 K to 397 °C

16. 273 K to 0 °C

17. 500 K to 227 °C

18. What is the boiling point of water in Farenheit, Celcius and Kelvin?

212°F      100°C      373K

19. What is the freezing point of water in Farenheit, Celcius and Kelvin?

32°F      0°C      273K

20. What is absolute zero? *OK.*

- Coldest possible temperature.

- The temperature at which no more energy can be removed from matter.

Matching: Use these definitions to help you with the rest of the worksheet.

- B 21. Radiation  
C 22. convection  
A 23. Conduction

- A. Heat transfers when objects are in contact.  
B. Heat travels in rays or waves.  
C. Heated gas or liquid particles expand and rise.

Label each example with the appropriate type of heat transfer: radiation, convection, or conduction.

24. Radiation Heat we feel from the sun.

25. Conduction The heat you feel when you touch a hot stove.

26. Radiation Heat you feel when you put your hands above a fire.

27. Convection This is responsible for making macaroni rise and fall in a pot on the stove.
28. Radiation The heat a snake feels from the heat lamp above him.
29. Convection Transfer of heat by the actual movement of the warmed matter (gas or liquid).
30. Convection The reason heating vents are usually placed on the floor of a home.
31. Conduction Why you use a pot holder when getting the cookie sheet out of the oven.
32. Radiation Heat you feel when you sit next to a campfire.

**Sorting:** place each item below into the appropriate box.

Word Box: Styrofoam— Paper Metal— Aluminum— Brass Plastic—  
Copper —Cotton— Wool— Bubble Wrap. Fabric

Conductors	Insulators
Copper Metal Aluminum Brass	Styrofoam Paper Cotton Wool Bubble Wrap Plastic Fabric

**Specific Heat:** Use the chart below to answer the following questions.

33. Which material would be easiest to heat up and cool down?

Why? Lead, lowest specific heat.

34. Which material would be hardest to heat up and cool down?

Why? Liquid water, highest specific heat.

MATERIAL	SPECIFIC HEAT (Joules/gram • °C)
Liquid water	4.18
Solid water (ice)	2.11
Water vapor	2.00
Dry air	1.01
Basalt	0.84
Granite	0.79
Iron	0.45
Copper	0.38
Lead	0.13

