

Chapter 13b

1. Be able to describe what is meant by the terms “macroscopic” and “microscopic.”
2. Be able to state the values of absolute zero, the freezing point of water, and the boiling point of water in Kelvin, Celsius, and Fahrenheit.
3. Be able to convert among Kelvin, Celsius, and Fahrenheit scales given an appropriate conversion relation.
4. Be able to calculate the change in length of a bar that undergoes a specified change in temperature, given the initial length and composition of the bar and a table of coefficients of linear expansion.
5. Be able to calculate the change in volume of an object that undergoes a specified change in temperature, given the initial volume and composition of the bar and a table of coefficients of linear expansion.
6. Be able to explain why a bimetallic strip curves when heated or cooled.
7. Be able to give examples of expansion joints from everyday life and to describe why they are needed.

Chapter 14

1. Be able to state the scientific definition of the term “heat.”
2. Be able to state the definition of the term “calorie.”
3. Be able to define “internal” energy and “thermal” energy and to describe in terms of a particle model for matter how thermal energy is stored in a substance. (What is different about an object that has more thermal energy than when it has less?)
4. Be able to define “heat” in the scientific sense.
5. Be able to describe what the “specific heat” (or “specific heat capacity”) of a sample of a substance is.
6. Be able to calculate the specific heat of a substance with data from a calorimetry experiment.
7. Be able to explain why the temperature of a substance does not increase or decrease during changes of its phase, even though the substance is gaining or losing energy during these phase changes.
8. Describe in terms of energy what has to happen if two free particles that attract each other are to become bound and what has to happen if two bound particles are to become free of each other.
9. Be able to describe why condensation is exothermic and evaporation is endothermic.
10. Be able to explain how the mist from “mistifiers” cool the air on hot days with low humidity.

11. Be able to explain how condensation provides energy for thunderstorms and hurricanes.
12. Be able to calculate how much energy is required to change the phase of a substance of known mass, given a table of latent heats of fusion and vaporization.
13. Be able to calculate how much energy is needed to change a known mass of a substance such as water from a specified temperature when solid to a specified temperature when vaporized.
14. Be able to describe all the energy and temperature features of a “heating curve” such as Figure 14-5.
15. Be able to describe three means by which energy can be transferred from one system to another, namely, conduction, convection, and radiation.
16. Be able to list good common thermal insulators and conductors.
17. Be able to describe things that you have observed that illustrate something we have dealt with in this chapter.