## Review Key Ideas and Vocabulary—Suggested Answers

| | | |
|---|---|---|
| 1. A | 2. D | 3. A |
| 4. C | 5. D | 6. D |
| 7. D | 8. D | 9. D |
| 10. A | 11. D | 12. A |

13. In a mutualistic relationship, both species involved benefit. An example is the birds that eat flies and other insects off the bodies of large mammals in Africa. The birds get food, and the mammals get rid of biting insects. In a commensal relationship, one species benefits and the other species is neither helped nor harmed. An example is the microscopic mites that live on the bodies of many mammals, including humans. The mites get food and shelter from the mammals, but they do not help or harm the mammals

14. The biosphere includes the soil, the atmosphere, and the oceans.

15. A

16. C

## Review Key Ideas and Vocabulary—Suggested Answers

1. **(a)** V; **(b)** VI; **(c)** IV; **(d)** I; **(e)** III; **(f)** II

2. As an object is heated, the particles in it gain kinetic energy. They begin to move more quickly. This causes them to collide more often and with greater energy. The increased energy of collision causes the particles in the object to move farther apart. This increases the volume of the object. Density is equal to mass divided by volume, so as volume increases, density decreases (mass does not change when heat is added).

3. Table 1

| State | Possible forms of heat transfer | Examples |
|---|---|---|
| (a) solid | conduction; radiation; convection (at conditions under which the solid is fluid) | conduction: spoon gets warm in cup of hot tea; radiation: piece of hot metal gives off radiant energy; convection: rock in Earth's mantle moves slowly |
| (b) liquid | conduction; convection; radiation | conduction: warm water transfers thermal energy to cooler air; convection: water in a pot on a stove circulates when pot is heated; radiation: water absorbs radiant energy from the sun |
| (c) gas | conduction; convection; radiation | conduction: hot air makes skin feel warm; convection: air in atmosphere circulates due to differential heating; radiation: hot gas emits radiant energy |

4. D

5. **(a)** 30 °C = 303.15 K; **(b)** 260 K = −13.15 °C

6. **(a)** False; When heated, gas particles get farther apart, and the gas expands and takes up more space.
   **(b)** False; The kinetic energy of a particle depends on its mass and its velocity.
   **(c)** True
   **(d)** False; Objects with no thermal energy do not emit radiant energy.
   **(e)** True
   **(f)** False; Electromagnetic radiation in the infrared portion of the spectrum is felt by our bodies as heat.

7. **(a)** extremely high pressure caused by gravitation, radioactive decay
   **(b)** The chemical composition and solid nature of the crust limit both radioactive and convective energy transfer.

8. Continents and large islands can change the directions of ocean currents and prevailing winds.

9. **(a)** At a given altitude, an increase in temperature produces a decrease in atmospheric pressure. **(b)** altitude increases, atmospheric pressure decreases.

10. Consistently high temperatures and solar radiation cause the Hadley cells to be strong. Hadley cel also very large and contain a great deal of matter.

11. On a hot, sunny day, the breeze would most likely blow from the lake onto the land. The lake wil remain cooler than the land because of the high specific heat of water. The cool lake water will ab heat from the air above it. This will decrease the temperature of the air and increase its pressure. A same time, the air above the land will become warmer by absorbing heat from the land. As the air the land becomes warmer, it expands and its pressure decreases. Air will move from the high-press region above the lake to the lower pressure region above the land. The moving air is wind.

12. A

13. A

14. B

15. C

16. D

17. B

18. It will probably get cloudier, and there will probably be snow, sleet, or freezing rain.

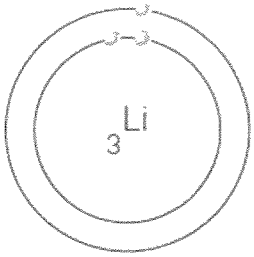
# Review Key Ideas and Vocabulary—Suggested Answers

1. B 2. C 3. B 4. A 5. D

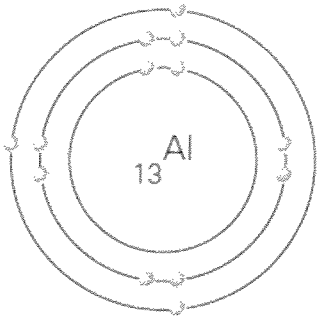
6. B 7. B 8. C 9. D

10. (a) F; (b) $O^{2-}$; (c) $O_2$; (d) $K^{1+}$

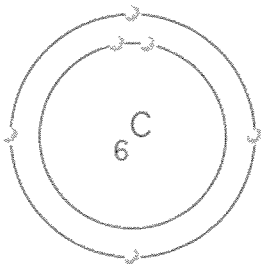
11. (a)



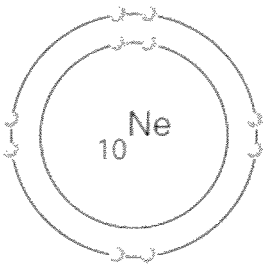

(b)




(c)




(d)




12. $H_2$, $O_2$, $N_2$, $F_2$, $Cl_2$, $Br_2$, $I_2$

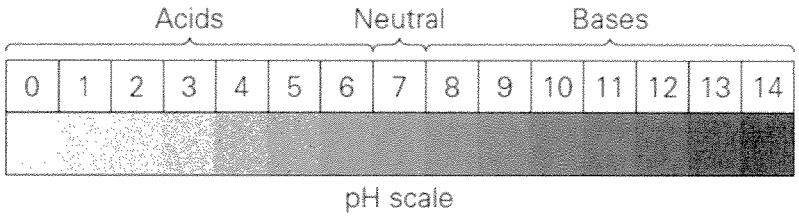
13. Using the crisscross method to write chemical formulas ensures that you have maintained the charge balance.

14. Ionic compounds are made up of ions. A bond forms between ions when one ion transfers electrons t another. Molecular compounds are made up of molecules, or covalently bonded atoms. Covalently bonded atoms share electrons.

15. (a) iii; (b) i; (c) ii

16. A 17. D

18.



**19.** An organic compound is a molecular compound that has carbon atoms as its basis.

**20.** According to the Law of Conservation of Mass, the total mass of the products of a chemical reaction equals the total mass of the reactants.

**21.** In order for a reaction to occur, colliding reactant molecules must have a certain minimum amount of energy. To give reactant molecules enough energy, you can increase the amount of reactant, increase the surface area of the reactants, increase temperature, and/or add catalysts.

**22.** A **23.** A

## Review Key Ideas and Vocabulary—Suggested Answers

1. A
2. a gamma ray; Neither gamma rays nor X-rays are particles like alpha and beta radiation.
3. C
4. C
5. **(a)** $^{4}_{2}\mathrm{He}$ **(b)** $^{0}_{-1}\mathrm{e}$ **(c)** $^{60}_{27}\mathrm{Co}$ **(d)** $^{0}_{+1}\mathrm{e}$ **(e)** $^{232}_{86}\mathrm{Rn}$
6. Table 1

| Nuclear Equation | Decay Type |
|---|---|
| $^{66}_{29}\mathrm{Cu} \longrightarrow {}^{66}_{30}\mathrm{Zn} + {}^{0}_{-1}\mathrm{e}$ | beta |
| $^{121}_{50}\mathrm{Sn} \longrightarrow {}^{121}_{51}\mathrm{Sb} + {}^{0}_{-1}\mathrm{e}$ | beta |
| $^{140}_{62}\mathrm{Sm} \longrightarrow {}^{136}_{60}\mathrm{Nd} + {}^{4}_{2}\mathrm{He}$ | alpha |
| $^{3}_{1}\mathrm{H} \longrightarrow {}^{3}_{2}\mathrm{He} + {}^{0}_{-1}\mathrm{e}$ | beta |
| $^{148}_{64}\mathrm{Gd} \longrightarrow {}^{144}_{62}\mathrm{Sm} + {}^{4}_{2}\mathrm{He}$ | alpha |
| $^{65}_{28}\mathrm{Ni} \longrightarrow {}^{65}_{29}\mathrm{Cu} + {}^{0}_{-1}\mathrm{e}$ | beta |
| $^{189}_{78}\mathrm{Pt} \longrightarrow {}^{189}_{79}\mathrm{Au} + {}^{0}_{-1}\mathrm{e}$ | beta |

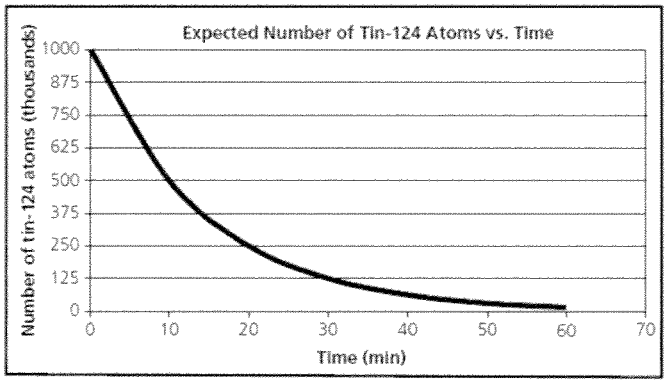
7. C

8. (a) $^{124}_{50}\text{Sn} \rightarrow {}^{124}_{51}\text{Sb} + {}^{0}_{-1}\text{e}$

(b) Table 2

| Time (min) | Expected number of tin-124 atoms | Expected number of decays | Activity (Bq) |
|---|---|---|---|
| 0 | 1 000 000 | 0 | NA |
| 10 | 500 000 | 500 000 | 833 |
| 20 | 250 000 | 250 000 | 417 |
| 30 | 125 000 | 125 000 | 208 |
| 40 | 62 500 | 62 500 | 104 |
| 50 | 31 250 | 31 250 | 52 |
| 60 | 15 625 | 15 625 | 26 |

(c)



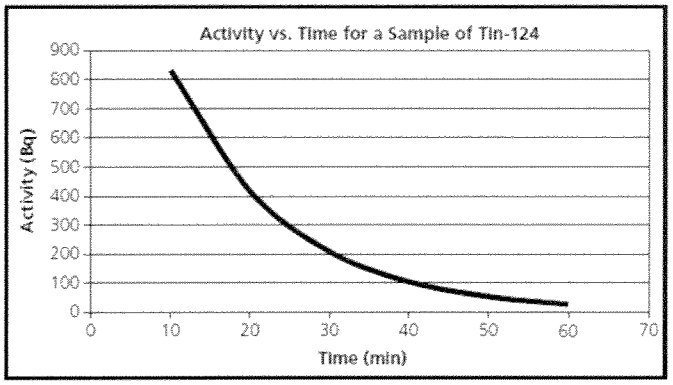



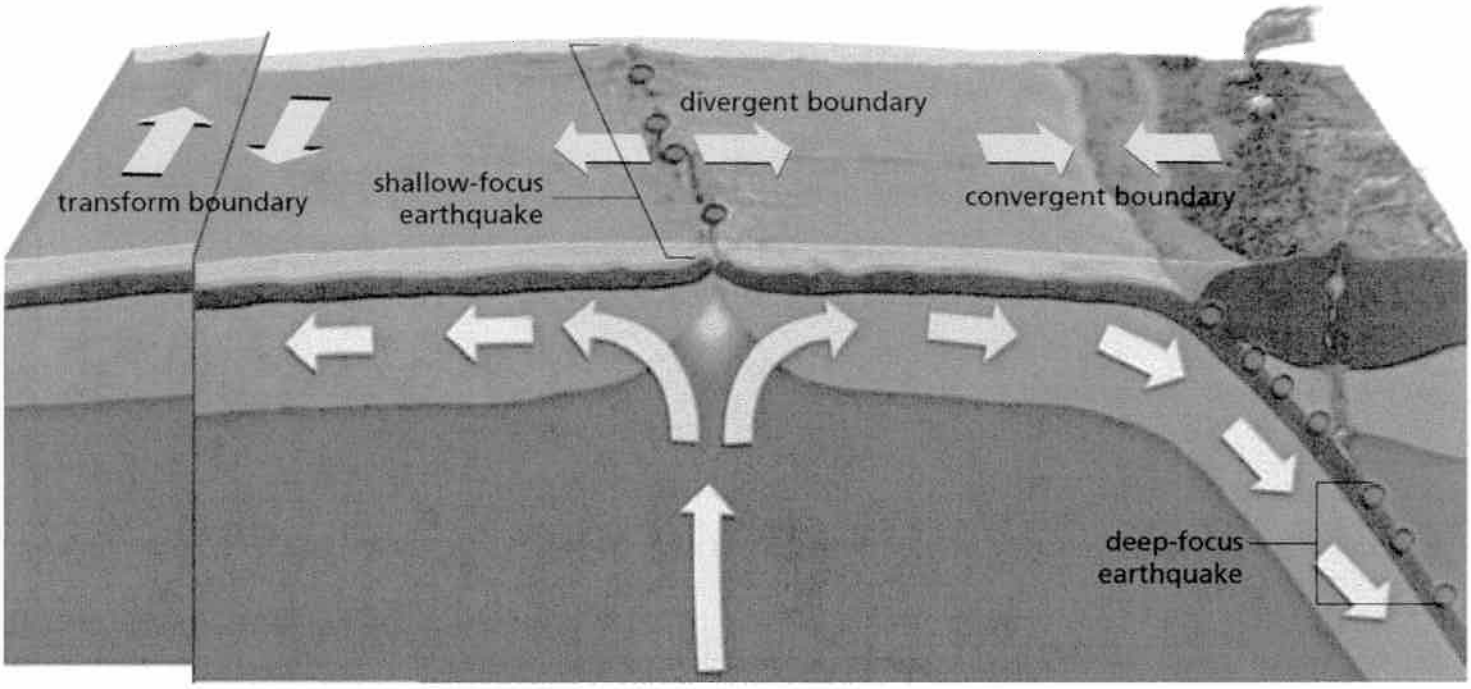
**Plate Tectonics**

# Key Ideas and Vocabulary—Suggested Answers

1. A 2. C 3. D 4. B 5. B

6. A 7. A 8. B 9. C 10. B 11. D

12.




13. (a) I (b) I, II, and III (c) I (d) II
(e) II (f) I (g) I

14. (a) III (b) I (c) IV (d) II

15. The Indian Plate is subducting beneath the Eurasian Plate. The crust on the Indian Plate is crumpling up and being added to the crust of the Eurasian Plate.

16. Sample organizer:

| | Oceanic crust | Continental crust |
|---|---|---|
| **Thickness** | 5 to 7 km thick | 30 to 100 km thick |
| **Composition** | (excluding overlying sediments) mainly basalt | mainly granite |
| **Density** | denser than continental crust | less dense than oceanic crust |

## Review Key Ideas and Vocabulary—Suggested Answers

1. 6.67 s  2. 16.7 m

3. **a)** 18.2 m/s; **b)** Because average speed is defined as the total distance traveled divided by the time required travel that distance, and both of those pieces of information are provided in the problem, no assumptions must be made about the horse's motion to answer the question.

4. 14 m/s [E]

5. 31.8 m/s down

6. 17.5 m/s [S]

## Use What You've Learned—Suggested Answers

7. A  8. C  9. A  10. B

11. **a)** 3 m/s [E] at 6 s and 4 m/s [E] at 10 s; **b)** 32 m; **c)** 2.3 m/s [E]; **d)** acceleration at 5 s = 0.5 m/s$^2$ [E]; acceleration at 9 s = 0 m/s$^2$; acceleration at 12 s = −1 m/s$^2$ [E] (or 1 m/s$^2$ [W])