Name _____ Class _____ Date _____

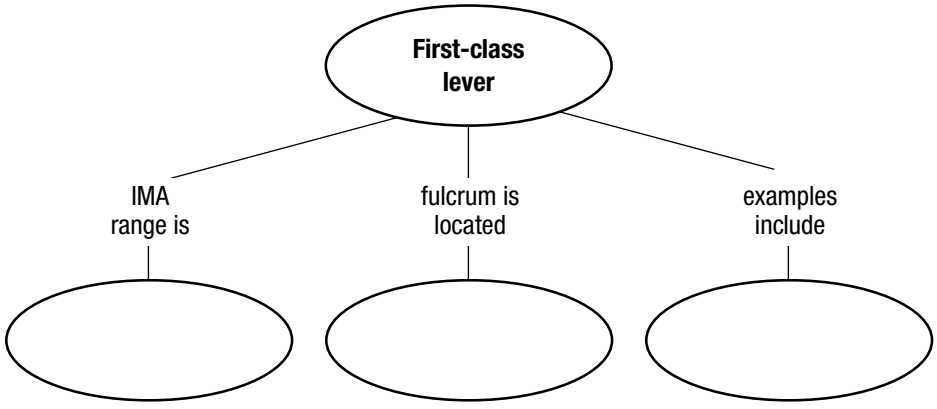
Section 14.4 Simple Machines

(pages 427–435)

This section presents the six types of simple machines. A discussion of how each type works and how to determine its mechanical advantage is given. Common uses of simple machines are also described.

Reading Strategy (page 427)

Summarizing After reading the section on levers, complete the concept map to organize what you know about first-class levers. On a separate sheet of paper, construct and complete similar concept maps for second- and third-class levers. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.



1. List the six types of simple machines.

a. _____ b. _____

c. _____ d. _____

e. _____ f. _____

Levers (pages 428–429)

2. A screwdriver used to pry the lid off a paint can is an example of a(n) _____.

3. The fixed point that a lever rotates around is called the _____.

4. To calculate the ideal mechanical advantage of any lever, divide the input arm by the _____.

5. What characteristics distinguish levers as first-class, second-class, or third-class?

_____

_____

6. Is the following sentence true or false? First-class levers always have a mechanical advantage that is greater than one.

_____

7. Is the following sentence true or false? All second-class levers have a mechanical advantage greater than one because the input arm is longer than the output arm. _____

Wheel and Axle (page 430)

8. Describe a wheel and axle. _____

_____

9. Circle the letter of the sentence that describes how to calculate the IMA of a wheel and axle.

a. Multiply the area of the wheel by the area of the axle.

b. Divide input force by output force.

c. Divide the diameter where input force is exerted by the diameter where output force is exerted.

d. Divide the radius of the wheel by the force exerted on it.

Inclined Planes (pages 430–431)

10. A slanted surface along which a force moves an object to a different elevation is called a(n) _____.

11. Is the following sentence true or false? The ideal mechanical advantage of an inclined plane is the distance along the incline plane divided by its change in height. _____

Wedges and Screws (page 431)

12. A thin wedge of a given length has a(n) _____ mechanical advantage than a thick wedge of the same length.

13. Screws with threads that are close together have a greater _____.

Pulleys (pages 432–433)

14. A simple machine consisting of a rope fitted into a groove in a wheel is a(n) _____.

15. What determines the ideal mechanical advantage of a pulley or pulley system?

_____

Compound Machines (page 435)

16. Is the following sentence true or false? A compound machine is a combination of two or more simple machines that operate together. _____

17. Circle each letter that identifies a compound machine.

a. a car b. a handheld screwdriver

c. a washing machine d. a watch