Name _____ Class _____ Date _____

Section 14.1 Work and Power

(pages 412–416)

This section defines work and power, describes how they are related, and explains how to calculate their values.

Reading Strategy (page 412)

Relating Text and Visuals As you read, look carefully at Figures 1 and 2 and read their captions. Complete the table by describing the work shown in each figure. 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.

Figure	Direction of Force	Direction of Motion	Is Work Done?
1			
2A			
2B			
2C			

What Is Work? (pages 412–413)

1. In science, work is done when a(n) _____ acts on an object in the direction the object moves.

2. Why isn't work being done on a barbell when a weight lifter is holding the barbell over his head? _____

_____

3. Describe what conditions of force and motion result in maximum work done on an object. _____

_____

4. Is the following sentence true or false? A vertical force does work on an object that is moving in a horizontal direction. _____

Calculating Work (pages 413–414)

5. In science, work that is done on an object can be described as the force acting on the object multiplied by the _____ the object moves.

6. Circle the letter of the correct form of the work equation to use when determining the distance an object moves as a result of a force applied to it.

a. Distance = Force × Work

b. Distance = $\frac{\text{Force}}{\text{Work}}$

c. Distance = $(\text{Force})^2$

d. Distance = $\frac{\text{Work}}{\text{Force}}$

7. The SI unit of work is the _____.
8. Circle the letter of the amount of work done when a 1 newton force moves an object 1 meter.
   a. 1 newton per second b. 1 joule
   c. 1 watt d. 1 newton per meter

What Is Power? (pages 414)

9. Is the following sentence true or false? Power is the rate of doing work. _____
10. In order to do work faster, more _____ is required.
11. Circle the letter of each sentence that is true about power.
    a. Power and work are always equal.
    b. You can increase power by doing a given amount of work in a shorter period of time.
    c. When you decrease the force acting on an object, the power increases.
    d. When you do less work in a given time period, the power decreases.

Calculating Power (pages 415)

12. Write a word equation describing how to calculate power. _____

_____

13. The SI unit of power is the _____.
14. Circle the letter of the expression that is equivalent to one watt.
    a. one newton per meter
    b. one joule per meter
    c. one newton per second
    d. one joule per second
15. How much work does a 100-watt light bulb do when it is lit for 30 seconds? _____

James Watt and Horsepower (page 416)

16. Circle the letter of the quantity that is approximately equal to one horsepower.
    a. 746 J b. 746 W
    c. 7460 N/m d. 7460 J
17. Why did James Watt use the power output of a horse to compare the power outputs of steam engines he designed? _____

_____