

20.1 Directed Reading

Section: Work and Power

- ___1. What is done when a force causes an object to move in the direction of the force?
 a. energy b. power c. work d. force

WHAT IS WORK?

- ___2. A moving bowling ball has what kind of energy?
 a. kinetic b. moving c. forced d. work
- ___3. Which of these examples is considered work?
 a. carrying a suitcase b. lifting a bag of groceries
 c. pushing a crate that does not move d. wearing a backpack

Force and Motion in the Same Direction

Read the words below. Fill in the blank with the word or phrase that best completes the sentence.

+++++
 direction force energy

4. Work is a transfer of _____ to an object.
5. For work to be done, the object must move in the _____ of the force.
6. Work is done if an object moves as a(n) _____ is applied to it.

HOW MUCH WORK?

- ___7. Which of the following is the formula for calculating work?
 a. $F = W \times d$ b. $d = W \times F$ c. $W = F \times d$ d. $W = F \times F$

Same Work, Different Forces

Read the words below. Fill in each blank with the word or phrase that best completes the sentence.

+++++
 push distance force

8. Work depends upon _____ as well as force.
9. It takes the same amount of work to _____ a car up a hill as to raise it up a cliff.
10. If you go up a slope to climb a hill, you need less _____ to do the work.

Calculating Work

- ___11. What is the unit used to express work?
 a. joule b. power c. watt d. energy
- ___12. Which two factors can increase the amount of work done?
 a. weight and power b. force and distance
 c. energy and distance d. weight and distance

POWER: HOW FAST WORK IS DONE

Calculating Power

- ___13. What is the formula for finding power?
 a. $power = work \times time$ b. $power = work + time$
 c. $power = work - time$ d. $power = work/time$

___ 14. What does an electric sander have that lets it do work faster?

a. less work

b. more power

c. more time

d. less force

Increasing Power

Read the words below. Fill in each blank with the word or phrase that best completes the sentence.

+++++

time

watt

power

output

+++++

15. The rate at which energy is transferred is called _____.

16. The unit used to express power is the _____.

17. Power output is greater when the _____ it takes to do work is smaller.

18. Car engines are rated with a _____ power.

KEY CONCEPTS

▲ A force acting through a distance is work.

■ Building Vocabulary Skills: Understanding Definitions

Decide whether work is being done in each of the following situations. If you think work is being done, write W before the item number. If you think work is not being done, write N.

_____ 1. You throw a baseball a distance of 20 meters.

_____ 2. You lift a suitcase to put it in the overhead luggage compartment of a plane.

_____ 3. You push against a brick wall until you are exhausted.

_____ 4. You carry a heavy bag of cat litter home from the pet store.

_____ 5. You slam a tennis ball across the net and score the winning point.

_____ 6. You study all night for a science test.

_____ 7. Your finger pushes down the RETURN key on a computer.

_____ 8. You move a shovelful of snow from the driveway to the lawn.

_____ 9. You and a friend push a heavy piano, causing it to move about 10 centimeters.

_____ 10. You stand for half an hour in the freezing cold waiting for the bus to come.