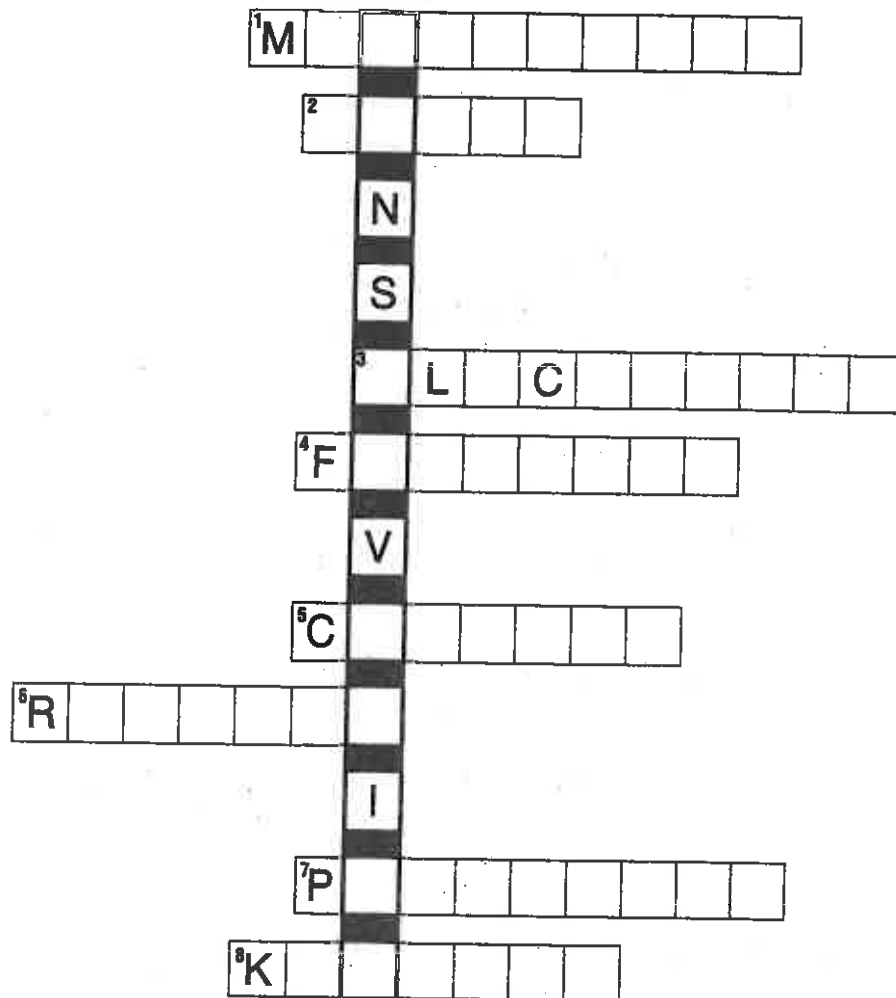


Directed Reading for
Content Mastery

Section 3 ■ Conservation
of Energy

Chapter
4.3
Review

Directions: Write the term that matches each description below on the spaces provided. The boxed letters should spell the answer to question 9.



1. Type of energy due to both the position and motion of an object
2. The rate at which energy is converted
3. Type of energy transformed into thermal energy in a toaster
4. Force that acts between two sticks when they are rubbed together
5. Unit used to measure the amount of energy that people get from food
6. Type of energy transformed into chemical energy by plants
7. Type of energy that is greatest at the top of a swing's path
8. Type of energy that is greatest at the bottom of a swing's path
9. What law of energy has never been broken? _____

SECTION

3

Reinforcement

Conservation of Energy

Directions: In each of the following situations, energy is changed from one form to another. Study each situation and identify the energy transformations in the space provided.

1. An electric blanket warms a bed on a chilly night.

Electrical →

2. A rock in Death Valley, California, becomes hot during a summer afternoon.

→ Thermal

3. A deputy sheriff rides a horse while directing traffic.

Chemical →

4. A chandelier brightens a ballroom after a waiter moves a switch.

Kinetic →

5. A swallow sitting on a fence sings a song for anyone who will listen.

Chemical → Kinetic →

6. A jet plane rapidly accelerates on the runway.

→ Kinetic

7. A walnut falls to the ground from a lofty branch on a walnut tree.

→ kinetic

8. A placekicker sends a football through the uprights of a goalpost.

→ kinetic

9. A base runner slides safely into third base.

Kinetic →

10. An athlete eats a bowl of pasta, then rides in a bicycle race.

→ kinetic

POWER

KEY CONCEPTS

▲ Power is the rate at which work is done, or the amount of work per unit of time.

■ Building Vocabulary Skills: Fill in the Blanks

From the terms listed below, choose the term or terms that best complete each sentence. You will use some terms more than once.

force

distance

work

power

joule

watt

time

rate

1. A 100-watt light bulb has more _____ than a 60-watt light bulb.
2. Power is the amount of _____ per unit of time.
3. The unit of power is equal to one _____ per second.
4. _____ is the rate at which work is done.
5. Electrical appliances are rated in _____.
6. Power can be calculated by multiplying force x distance and dividing by _____.
7. When the _____ of doing work increases, power increases.
8. A 150-watt bulb does 150 _____ of work.

■ Calculating Power: Using the Main Ideas

Complete the chart below by filling in the missing quantities.

	Force (N)	Distance (m)	Time (s)	Work (J)	Power (W)
1.	10	6	4		
2.	25	4	5		
3.	30		10	600	
4.	500	10	10.0		
5.		16	8	64	
6.	100	0.5			25

WORK vs. POWER

The concept of power is dependent upon two factors: the amount of work done and the time taken to do it. The measurement of power may be expressed as:

$$\text{power} = \text{work/time}$$

PART A

	Work	Time	Power
A	300 J	2 sec	
B	2500 J	8 sec	
C	20,000 J	2.5 min	

PART B

Answer each of the following questions:

1. The standard unit for measuring power in each of the above situations is the _____.
2. In which situation above is the greatest amount of power being demonstrated? _____ In which is the least? _____.
3. In each situation, if the time required was half as much shown in the table, the power would be _____ as much.
4. If the time required to do a certain amount of work is increased, the amount of power to do it is _____.

Work, Power, and Efficiency

Worksheet Reteaching LESSON 5.4 ■ LEVEL 1



1. Power is the rate of doing work. It is a measure of how quickly work gets done. You express power in _____.

a. joules
b. seconds
c. watts

2. You calculate power by dividing the work done by the time it takes to do the work. Write the formula for power. Use P for power, W for work, and t for time.

3. Lifting barrels onto a truck, a forklift does 6000 joules of work. The job takes 15 seconds.

a. To find the power of the forklift, you need to find values for work and time. List the data.

b. Substitute the data from the problem in the formula for power.

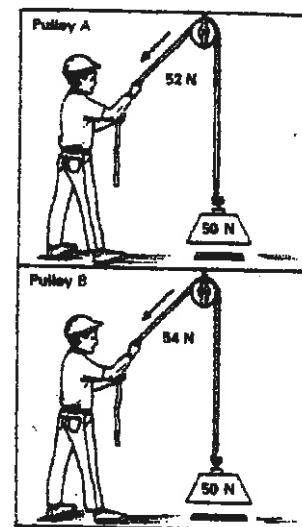
c. What is the correct unit for power?

d. The power of the forklift is _____.

4. Machines with more moving parts usually have less _____.

5. No machine has _____ percent efficiency.

6. In the drawing, the pulley labeled _____ is more efficient.



7. A horse performs 15,000 joules of work pulling a wagon for 20 seconds. What is the horse's power? (FYI - This is the number of watts in one horsepower)

8. A 750 N pole vaulter lifts himself 5.0 m high in 2.5 seconds. What is his power?

Chapter
Review

Work and Energy

Part A. Vocabulary Review

Directions: Match the description in the first column with the term in the second column by writing the correct letter in the space provided.

- | | |
|-------------------------------------------------------------------|-----------------------------------|
| _____ 1. total amount of kinetic and potential energy in a system | a. energy |
| _____ 2. the ability to cause change | b. work |
| _____ 3. stored energy due to position | c. kinetic energy |
| _____ 4. energy in the form of motion | d. law of conservation of energy |
| _____ 5. Energy cannot be created or destroyed | e. gravitational potential energy |
| _____ 6. does work with only one movement of the machine | f. mechanical energy |
| _____ 7. energy stored in chemical bonds | g. potential energy |
| _____ 8. ratio of output work to input work | h. simple machine |
| _____ 9. energy stored by things that are above earth | i. efficiency |
| _____ 10. SI unit of energy | j. chemical potential energy |
| _____ 11. force applied through a distance | k. joule |

Part B. Concept Review

Directions: Complete the following sentences using the correct terms.

- _____ 1. The amount of kinetic energy a moving object has depends on its mass and its _____.
- _____ 2. The potential energy of an object depends on its _____.
- _____ 3. The energy stored in foods and fuels is _____ potential energy.
- _____ 4. The law of _____ states that energy cannot be created or destroyed.
- _____ 5. A compound machine is a combination of two or more _____.
- _____ 6. The number of times a machine multiplies the effort force is the _____ of the machine.
- _____ 7. You convert kinetic energy into thermal energy when you rub two sticks together because of _____.