

Work and Energy

Before You Read

Before you read the chapter, respond to these statements.

1. Write an **A** if you agree with the statement.
2. Write a **D** if you disagree with the statement.

Before You Read	Work and Machines
	• Holding a heavy object motionless involves a lot of work.
	• Energy is lost when an object is motionless.
	• A machine is a device that creates energy.
	• A light bulb transforms electrical energy into light and thermal energy.



Construct the Foldable as directed at the beginning of this chapter.

Science Journal

Diagram a bicycle and identify the parts you think are machines.

Work and Energy

Section 1 Work and Machines

Skim Section 1 of your text. Write three questions that come to mind from reading the headings and the illustration captions.

1. _____

2. _____

3. _____

Review Vocabulary

Define the word force.

force _____

New Vocabulary

Use your book or a dictionary to define these terms.

work _____

machine _____

simple machine _____

compound machine _____

efficiency _____

mechanical advantage _____

Academic Vocabulary

Look up the words per and cent in a dictionary.

percent _____

Section 1 Work and Machines (continued)

Main Idea

What is work?

*I found this information
on page _____.*

Details

Create *three sketches showing the following situations involving work.*

A force is doing work.

A force is not doing work, because there is no motion.

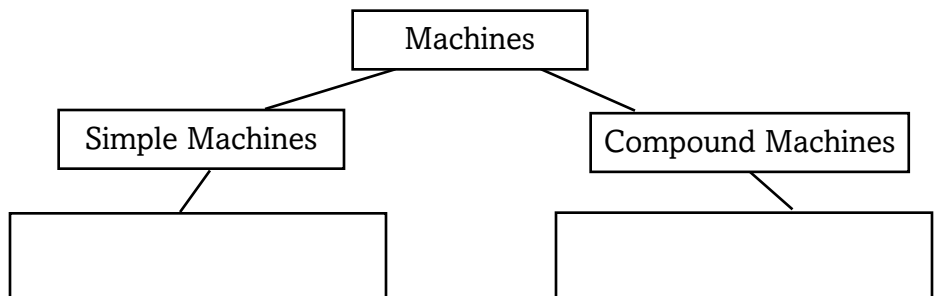
A force is not doing work, because the force does not point to the direction of motion.

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What is a machine?

*I found this information
on page _____.*

Complete *the concept map relating simple and compound machines.*



Sketch *a nail and a screw. Explain which one uses less force and why.*

Section 1 Work and Machines (continued)

Main Idea

Details

Efficiency

I found this information
on page _____.

Evaluate the efficiency of two identical-looking conveyor belts. Belt A can move a 10 newton weight one meter in 3 seconds. Belt B can move a 10 newton weight 2 meters in 3 seconds. (one joule = 1 newton meter) The input work for both belts is 20 joules. Fill in the missing numbers below.

What do you know?

Belt	A	Belt B
Weight (newtons)		
Distance (meters)	1	
Time (seconds)	3	3
Joules = Newton/meter	10 Nm	6 Nm
Joules		
Input work (W_{in})	20 J	20 J
Output work (W_{out})		
Efficiency (%) = $W_{out} \div W_{in} \times 100$		

CONNECT IT

A child sits at the top of a slide at a playground. He wiggles forward slightly, and then slides all the way down with no further effort. Explain the source of the force acting on the child, and how you would calculate the work being done.