

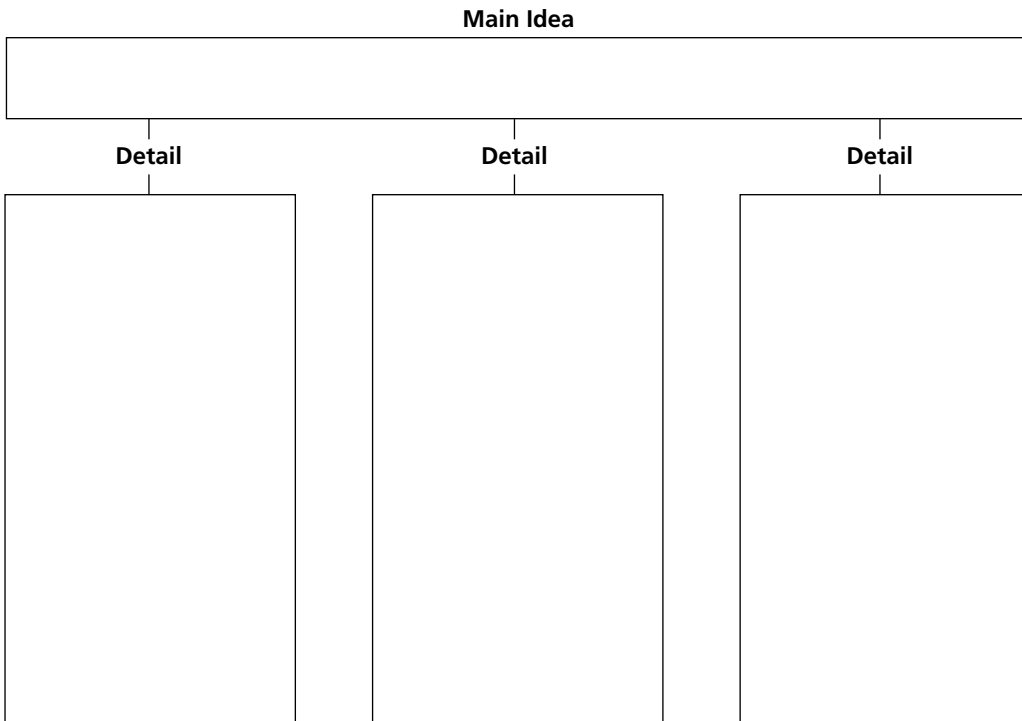
Work and Machines ▪ *Guided Reading and Study*

How Machines Do Work

This section explains how machines make work easier and describes how to calculate the efficiency and mechanical advantage of a machine.

Use Target Reading Skills

As you read the section under the heading *What is a Machine?*, look for the main idea and record it in the graphic organizer. Then, find three details that support the main idea, and add the details to the graphic organizer.



What Is a Machine?

1. What is a machine?

2. Is the following sentence true or false? A machine decreases the amount of work needed to do a job. _____

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3. Circle the letter of the sentences that are true about how a machine makes work easier.
 - a. A machine makes work easier by multiplying force you exert.
 - b. A machine makes work easier by reducing the amount of work needed to do the job.
 - c. A machine makes work easier by multiplying the distance over which you exert force.
 - d. A machine makes work easier by changing the direction in which you exert force.
4. The force you exert on a machine is called the _____.
5. The force exerted by the machine is called the _____.
6. Is the following sentence true or false? In some machines, the output force is greater than the input force. _____
7. If a machine allows you to use less force to do some amount of work, then you must apply the input force over a greater _____.
8. Is the following sentence true or false? In some machines, the output force is less than the input force. _____
9. Write labels on the illustration below to show which arrow represents the input force and which represents the output force.



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How Machines Do Work *(continued)*

Mechanical Advantage

10. What is a machine's mechanical advantage?

11. What is the formula you use to determine the mechanical advantage of a machine?

12. In a machine that has a mechanical advantage of more than 1, the _____ force is greater than the _____ force.

Efficiency of Machines

13. In any machine, some work is wasted overcoming _____.

14. The comparison of a machine's output work to its input work is _____.

15. What is the formula you use to calculate the efficiency of a machine?

16. The mechanical advantage that a machine provides in a real situation is called the _____ mechanical advantage.

17. The mechanical advantage of a machine without friction is called the machine's _____ mechanical advantage.