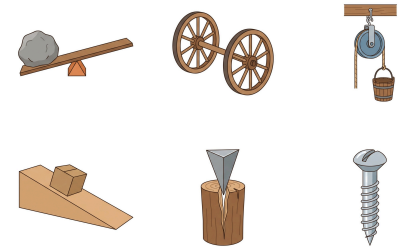


Six Machines That Make Work Easier

Read the text. Then answer the questions on the next page.

- ① A heavy rock sits in the garden. You cannot lift it by hand, but a long bar and a small block can help. First, slide one end of the bar under the rock. Next, set the block under the bar, close to the rock. Last, push down on the far end of the bar. Up comes the rock! The bar is a **simple machine**, a tool with few or no moving parts that makes work easier. There are six kinds.
- ② The bar is a **lever**, a stiff bar that turns on a fixed point called the **fulcrum**. The block is the fulcrum. The rock is the **load**, the thing being moved. Your push on the bar is the **effort**. A **wheel and axle** is a wheel fixed to a rod, called the axle, so that the two turn together. A doorknob works this way. A **pulley** is a wheel with a groove around its rim that holds a rope.
- ③ An **inclined plane** is a flat, slanted surface, like a ramp. A **wedge** is thick at one end and thin at the other. Pushed into a log, it splits the wood apart. The two have the same shape. But a ramp stays still while the load moves along it, and a wedge is the part that moves. A **screw** is an inclined plane wrapped around a rod. Its spiral ridge is called the **thread**.
- ④ Simple machines do not give you extra energy. They change the size or the direction of a **force**, which is a push or a pull. Pushing a box up a ramp takes less force than lifting it straight up, but you must push it a longer distance. You do not do less work. One fixed pulley does not make the force smaller at all. It only changes its direction. You pull down on the rope, and a bucket goes up.
- ⑤ Bigger machines, like bicycles and cranes, are made of simple machines working together. Scissors are two levers, and the edge of each blade is a wedge.



The six simple machines. Top row: lever, wheel and axle, pulley. Bottom row: inclined plane, wedge, screw.

Six Machines That Make Work Easier: Questions

Go back to the text to find each answer. The paragraphs are numbered to help you.

1. What is this text mostly about?

- ☐ How to move rocks in a garden
- ☐ The six simple machines and how they make work easier
- ☐ How bicycles and cranes are built
- ☐ Why some rocks are heavy

2. Number the steps 1, 2 and 3 to show how to lift the rock (paragraph 1).

- ☐ Set the block under the bar, close to the rock.
- ☐ Push down on the far end of the bar.
- ☐ Slide one end of the bar under the rock.

3. What is a fulcrum?

- ☐ The thing a machine moves
- ☐ The spiral ridge on a screw
- ☐ The fixed point that a lever turns on
- ☐ The rod in the middle of a wheel

4. Which simple machine is a wheel with a groove around its rim that holds a rope?

- ☐ Lever
- ☐ Wheel and axle
- ☐ Wedge
- ☐ Pulley

5. A wedge and a ramp have the same shape. What is the difference between them?

6. What is a screw?

- ☐ A stiff bar that turns on a fixed point
- ☐ An inclined plane wrapped around a rod
- ☐ A wheel fixed to a rod
- ☐ A flat, slanted surface

7. Pushing a box up a ramp takes less force than lifting it straight up. What do you give up?

8. What does one fixed pulley change?

Six Machines That Make Work Easier: Answer Key

Answers are in green. Written answers will vary; these are examples.

1. What is this text mostly about?

- ☐ How to move rocks in a garden
- ☒ **The six simple machines and how they make work easier**
- ☐ How bicycles and cranes are built
- ☐ Why some rocks are heavy

2. Number the steps 1, 2 and 3 to show how to lift the rock (paragraph 1).

- 2

 Set the block under the bar, close to the rock.
- 3

 Push down on the far end of the bar.
- 1

 Slide one end of the bar under the rock.

3. What is a fulcrum?

- ☐ The thing a machine moves
- ☐ The spiral ridge on a screw
- ☒ **The fixed point that a lever turns on**
- ☐ The rod in the middle of a wheel

4. Which simple machine is a wheel with a groove around its rim that holds a rope?

- ☐ Lever
- ☐ Wheel and axle
- ☐ Wedge
- ☒ **Pulley**

5. A wedge and a ramp have the same shape. What is the difference between them?

A ramp stays still while the load moves along it. A wedge is the part that moves.

6. What is a screw?

- ☐ A stiff bar that turns on a fixed point
- ☒ **An inclined plane wrapped around a rod**
- ☐ A wheel fixed to a rod
- ☐ A flat, slanted surface

7. Pushing a box up a ramp takes less force than lifting it straight up. What do you give up?

You must push the box a longer distance.

8. What does one fixed pulley change?

Only the direction of the force. It does not make the force smaller.
