



TEACHER GUIDE

• Assessment Rubric	4
• How Is Our Resource Organized?	5
• Bloom's Taxonomy for Reading Comprehension	6
• Vocabulary	6



STUDENT HANDOUTS

• Reading Comprehension	
1. <i>What Are Force, Motion, and Work?</i>	7
2. <i>What Are Simple Machines?</i>	12
3. <i>Levers</i>	16
4. <i>Wheel and Axles and Pulleys</i>	22
5. <i>Inclined Planes, Wedges, and Screws</i>	27
6. <i>Compound Machines</i>	32
7. <i>Gains and Losses with Simple Machines</i>	36
• Hands-on Activities	42
• Crossword	46
• Word Search	47
• Comprehension Quiz	48



EASY MARKING™ ANSWER KEY	50
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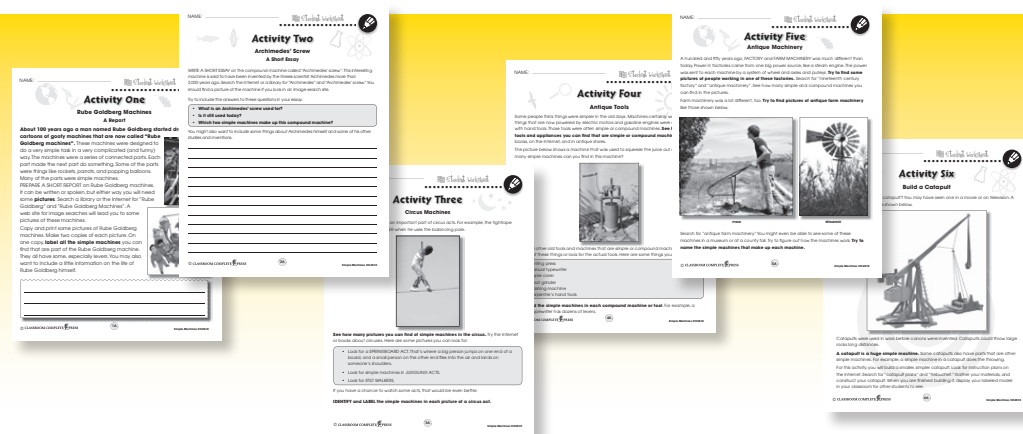
MINI POSTERS	55
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FREE!

6 Bonus Activities!

3 EASY STEPS to receive your 6 Bonus Activities!

- Go to our website:
www.classroomcompletepress.com/bonus
- Click on item CC4510 – Simple Machines
- Enter pass code CC4510D





Levers

1. Put a check mark (✓) next to the answer that is most correct.

- a) Which tells what a simple machine is?
- A a machine with no motor
 - B a machine with no moving parts
 - C a machine with one moving part
 - D a machine with only one kind of motion
- b) What does a simple machine do when it makes your effort less?
- A makes work go faster
 - B makes your power more
 - C makes the amount of work you do less
 - D makes resistance force greater than applied force
- c) All of these are simple machines, except:
- A screw
 - B pulley
 - C electric fan
 - D wheel and axle

2. Circle the word True if the statement is true. Circle the word False if it is false.

- a) A lever is a simple machine.
True False
- b) Simple machines change the effort needed to do work.
True False
- c) Work equals force plus distance.
True False
- d) Power is the same as energy.
True False
- e) Pounds and newtons measure the same thing.
True False

3. Look up the word PIVOT in a dictionary. Write down its definition below.
The dictionary definition of pivot is:



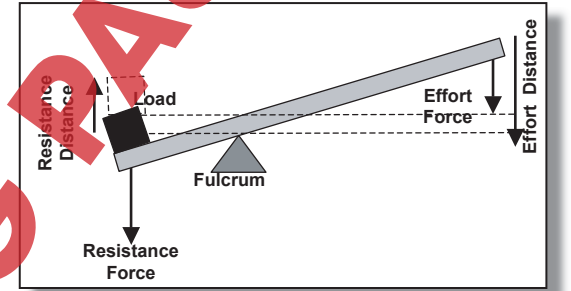
Levers

The lever was probably the first simple machine used by humans many thousands of years ago. The first person to whack something with a club was using a lever.



Oars are First-Class Levers

The picture shows the two parts of every lever. For every lever, a board or rod pivots on a point called a fulcrum. The force you apply is called the effort force. The lever changes the direction and amount of force and applies it to a load. The force the lever applies is called the resistance force. The distance you have to push or pull the lever is called the effort distance. The distance the load moves is called the resistance distance.



A First-Class Levers

For the oars shown above, the pivot at the edge of the boat (the oarlock) is the fulcrum. The effort force is applied to the oar handle. As the handle moves through the effort distance, it applies the resistance force to the end in the water. The distance the oar moves through the water is the resistance distance.

There are three kinds of levers because there are three ways to arrange the effort, fulcrum, and load. The oar is a first-class lever, where the arrangement is effort-fulcrum-load. Other first-class levers are pliers, scissors, and that little tab you pull to open a can of soft drink.

What are the two parts of every lever?

STOP



Levers

1. Fill in each blank with a word from the list. All words will be used more than once.

effort fulcrum resistance

- a) A lever pivots on its _____.
- b) When a lever is used, the load moves through the _____ distance.
- c) The part of a lever that is a board or rod rests on the _____.
- d) The force applied to a lever is called the _____ force.
- e) The weight of the load on a lever is the _____ force.
- f) The distance you have to push a lever is the _____ distance.

2. Put a check mark (✓) next to the answer that is most correct.

- a) Which tool is most often used as a lever?
- A a nail
 - B a knife
 - C a wheelchair ramp
 - D a bottle opener

b) A second-class lever is shown below.



What can this lever do?

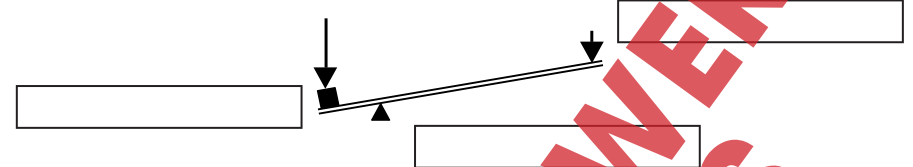
- A Make less work.
- B Change the direction on the applied force.
- C Make the force on the load greater than the effort force.
- D Make the load move faster than the place where the effort force is applied.



Levers

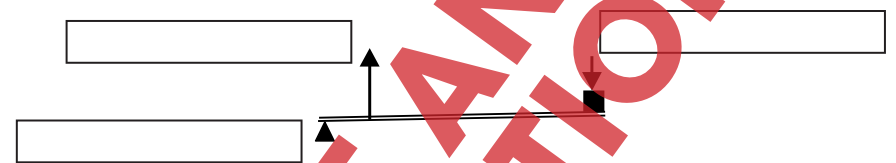
3. Answer the questions by writing the answers in the boxes.

a) A first-class lever is shown below.



Label the effort force, the resistance force, and the fulcrum.

b) A third-class lever is shown below.



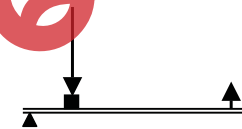
Label the effort force, the resistance force, and the fulcrum.

Extension & Application

4. First-class, second-class, and third-class levers are shown below.



First-Class Lever



Second-Class Lever



Third-Class Lever

Look at the Three Classes of Levers chart on the next page. Read the questions for each class of lever. Answer each question by writing YES or NO in the spaces provided.



Machine Hunt Game

This game is played with two or more people. You will hunt for one example of each of the different kinds of simple machines in your home or at school. The winner is the person to find **all six** simple machines first. Set a time limit of 20 or 30 minutes. If no one has found all six when the time is up, then whoever has found the most simple machines wins.

Remember that the **SIX SIMPLE MACHINES** are:

inclined plane

wedge

lever

wheel and axle

pulley

screw

Set some boundaries, like inside your house. The kitchen is a good place to start. A toy box or tool box are also good places to look. Look carefully. You will probably find some simple machines in places you never expected to find them!

Good luck, and have fun hunting!



Crossword Puzzle!

Word List

machine
newton
pivot
simple
wedge
lever
resistance
effort
distance
pulley
exert
motion
wheel
watt
friction
force
planes
work
axle
screw



Across

- The force you apply to a simple machine is the _____ force.
- With a rope and a wheel you can make a _____.
- A machine with only one kind of movement is a _____ machine.
- Force times distance.
- A spiral staircase is a kind of _____.
- A change from one place to another.
- You can make one with a board and a fulcrum.
- One joule per second.
- Wheel and _____.
- Something to do work with less effort.
- A push or a pull.

Down

- The force that slows down something that is sliding.
- Ramps are inclined _____.
- How force is measured in the metric system.
- _____ and axle.
- How far a lever moves the load is the resistance _____.
- The simple machine that looks like a piece of cake.
- The load on a lever is the _____ force.
- To apply a force is to _____ a force.
- What levers do on their fulcrums.



Comprehension Quiz

25

Part A

Circle the word True if the statement is true. Circle the word False if it is false.

- When a force causes something to move, work is done.
True False
- Work is power.
True False
- A candle is a simple machine.
True False
- A lever pivots on its fulcrum.
True False
- A doorknob is a wheel and axle.
True False
- A wedge is a kind of lever.
True False
- We don't have to do as much work when we use a simple machine.
True False

Part B

Put a check mark (✓) next to the answer that is most correct.

- Which two things do we need to know to find how much work is done?
 A time and distance
 B distance and force
 C force and energy
 D energy and time
- Which of these simple machines usually doesn't move when it is being used?
 A lever
 B pulley
 C inclined plane
 D wheel and axle
- Which of these is a simple machine?
 A match
 B pencil
 C watch
 D wedge

Pulleys and Wheel and Axles





Inclined Planes, Wedges, and Screws

1. **Circle** the word True if the statement is true. **Circle** the word False if it is false.

a) A wedge is like two inclined planes put together.

True False

b) A spiral staircase is like a very large lever.

True False

c) Wedges and inclined planes can be seen as types of screws.

True False

d) Pushing a wedge through something changes a downward force into two sideways forces.

True False

e) The grooves on a screw are called needles.

True False

2. Tell whether these things are inclined planes, wedges, or screws. In the space beside the name of each thing, write **IP** for INCLINED PLANE, **W** for WEDGE, or **S** for SCREW.

_____ a) spiral staircase

_____ b) wheelchair ramp

_____ c) threaded bolt

_____ d) knife

_____ e) path to the top of a hill

_____ f) axe

1. a) True

b) False

c) False

d) True

e) False

3. Answers will vary (i.e. It is a slope wrapped round and round.)

4. Gravity

5. The effort force is down and the resistance forces are sideways.

6. a) 150 feet

1. a) False

b) True

c) True

d) True

e) False

2. a) A

1. a) False

b) True

c) True

d) False

EASY MARKING ANSWER KEY

2. a) S

b) IP

c) S

d) W

e) IP

f) W

30

b) Less distance

c) Less effort

d) No, because the vertical distance is the same.

e) If you went up the ladder faster you would develop more power.

31

b) D

c) D

Two wedges and two levers.

33

2. a) wheel and axle
b) levers

c) wedge

34