NAME: _____

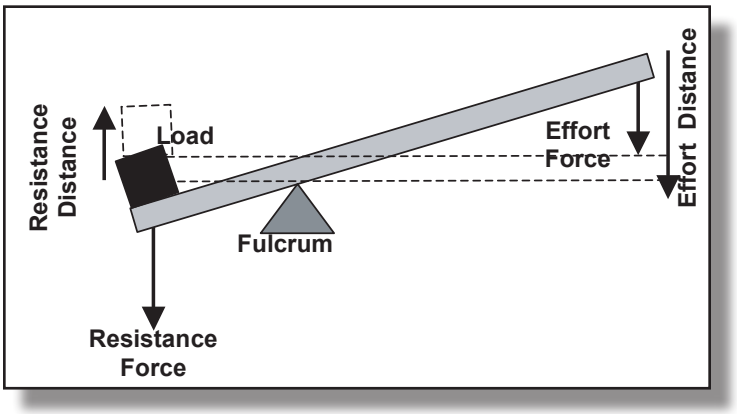
Reading Passage

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?

_____

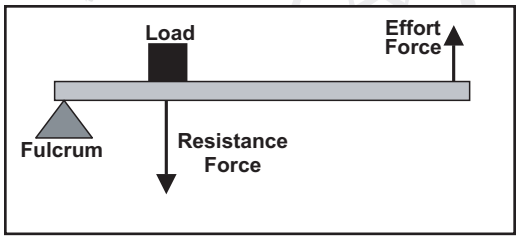
_____

Reading Passage

NAME: _____

Levers

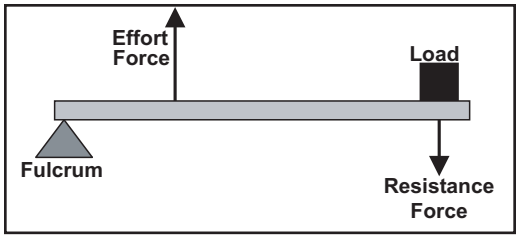
A **second-class lever** is shown below. For a second-class lever, the arrangement is effort-load-fulcrum. Some other second-class levers are a wheel barrow and a nutcracker. The classes are just names. It doesn't mean that first-class levers are the best. The third-class lever shown below is just as classy as the others.



Second-Class Lever

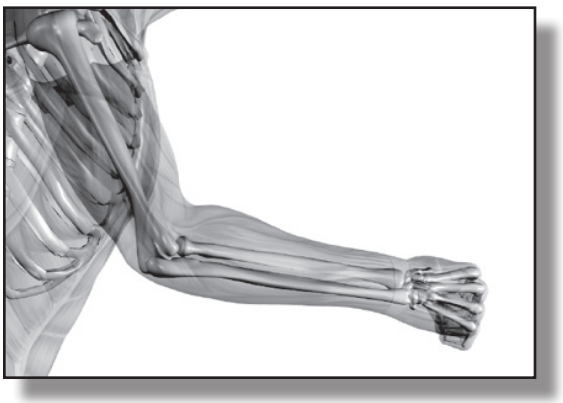
A Bottle Opener is a Second-Class Lever

For the hammer, the resistance is at the head, and the fulcrum is the back of the hand. Many other **third-class levers** are used to make the resistance force push over a long distance at a high speed. The effort force is large and moves over a shorter distance. This is also how tennis rackets, baseball bats, and brooms work as third-class levers.



Third-Class Lever

Can you find another lever in the picture of the hammer? The human forearm is a lever. The elbow is the fulcrum. When the hammer comes down, the muscle behind the elbow pulls up. Then it is a first-class lever. When the hammer is lifted up, the muscle in front of the elbow pulls up. Then it is a third-class lever.



The Forearm is a First-Class Lever and a Third-Class Lever

A Hammer is a Third-Class Lever