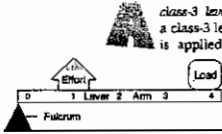


INVESTIGATION 2

Build a Dig

CLASS-3 LEVERS

INVESTIGATION 2



A class-3 lever is another arrangement of the lever. In a class-3 lever, the fulcrum is at one end, and the effort is applied between the fulcrum and the load. With this kind of lever, the direction of effort is not changed. The load moves in the same direction as the effort. The gain offered by a class-3 lever is one of distance.

A fishing pole is a class-3 lever. The hand placed at the end of the fishing pole acts as the fulcrum, and the load is the fish that's caught at the opposite end. The hand applying the effort and the fish applies the effort. The hand applying effort moves a short distance to move the fish a longer distance. The cost is effort.

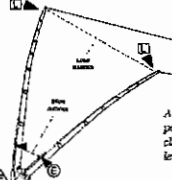
A hammer used to drive a nail is another class-3 lever. When you hold the hammer's handle, your elbow acts as the fulcrum.

The load is the resistance offered by the material into which you are driving the nail. The hitting end of the hammer moves farther than your lower arm does to apply force. The hitting end gains not only distance but speed to do its job.

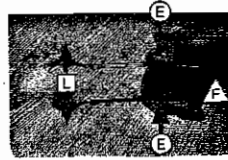
Many sports are played with class-3 levers. Baseball bats, hockey sticks, golf clubs, and tennis and badminton rackets all gain speed because the hitting end moves faster than your arm. Class-3 levers also include many tools. Shovels, pitchforks, hoes, and brooms are all class-3 levers. They provide a gain in distance. Your arms and legs



A baseball bat is a class-3 lever that provides a gain in both distance and speed.



A fishing pole is a class-3 lever.



Tongues are an example of a double class-3 lever.

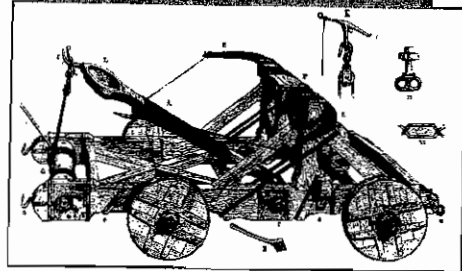
also work as class-3 levers. Where are the fulcrum and load for these class-3 levers? Can you determine where the effort is applied?

Class-3 levers can work together. The place where the levers join is the fulcrum, and the effort is applied between the fulcrum and the load. Tweezers and ice tongs are examples of double class-3 levers.

The arms of tweezers work together to form a double class-3 lever.

Catapults

In ancient times and in the Middle Ages, people used war machines called catapults. Some of them worked as class-2 and class-3 levers to shoot arrows or hurl heavy rocks. One end of the lever acted as the fulcrum. A rock load was placed at the opposite end of the lever. Beyond the load, a rope attached to a wheel and axle pulled back the lever. This is a class-2 lever. When the rope was released, the lever propelled the load a long distance with great force. Can you see how the lever throwing the rock is a class-3 lever? Where are the load, the effort, and the fulcrum?



Standard 56d, 57c

parent signature

look at the data you collected on page
 Tell about the effort required to lift the load



Name sports equipment (3 pieces) that uses the ideas of a third class lever.

bob

Our goal is to identify and understand the class 3 lever.