5 Levers

A lever is designed to make it easier for you to lift, cut or squeeze.

A lever is something that multiplies force. The simplest lever is a bar, but there are many kinds of levers. Even a screw is a lever!

How a lever works

Picture 1 shows the sort of long, hooked bar used to get nails out of wood. You would never get a nail out of wood by using your fingers. What you need to do is to multiply your force. You do this with a long bar.
When you use a bar like this, you pivot the bar close to the thing you want to move. In this case, the bend in the bar is used as the pivot.

(Picture 1) You would not be able to pull a nail out with your fingers, but it is easy with a lever.

The longer, the better

When you use a lever, the further you are from the pivot, the more your force is multiplied. So the longer the lever is, the more powerful it can be.

The Ancient Greek scientist, Archimedes, once said, "Give me a long enough lever and I could move the Earth." In theory this is true, but, of course, he would also have needed a pivot somewhere in space.

Many kinds of pivot

The key to using a lever is the pivot. Picture 2 shows you a person using a plank to move a large log. Notice that the plank rests on a smaller log and that the small log (the pivot) is close to the large log. To see how it works compare it to Picture 1.

Picture 3 shows a pair of scissors. In this case there are two levers fixed together. The pivot is where they are fastened. You can see the importance of

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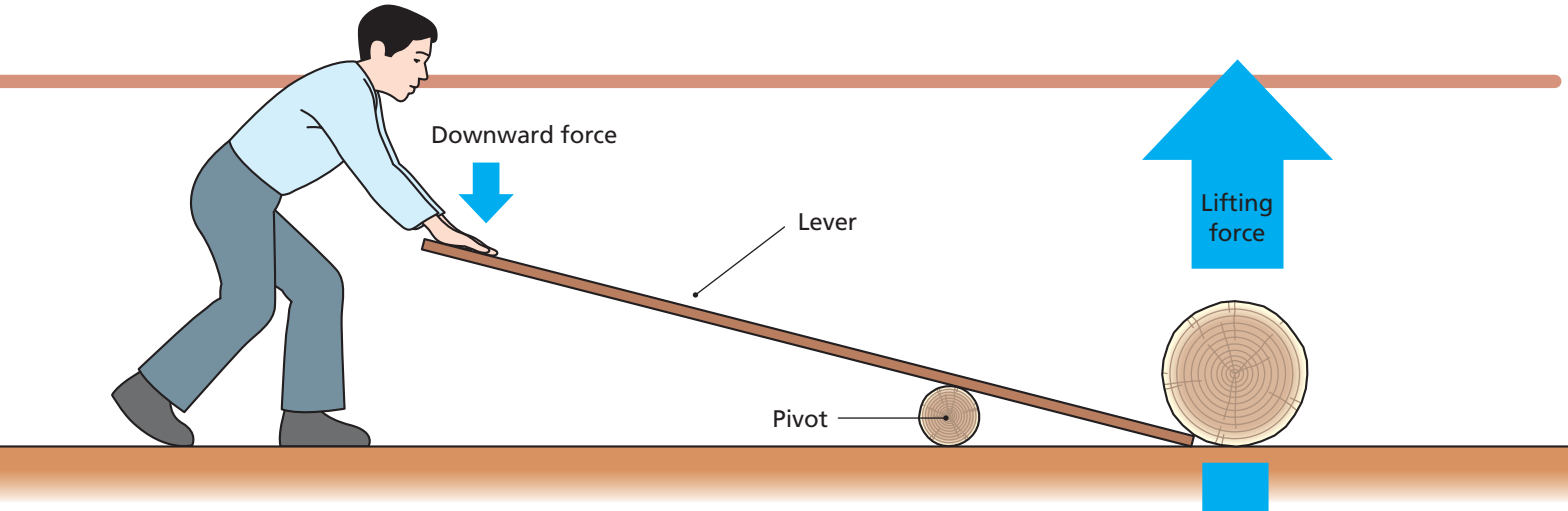
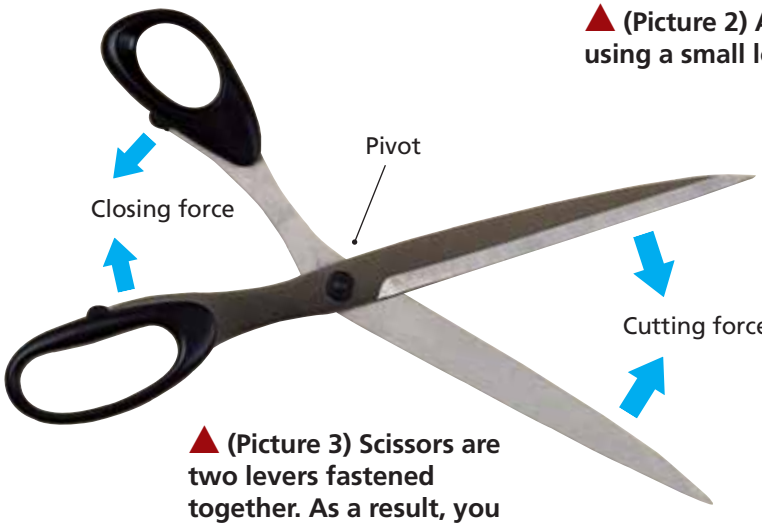
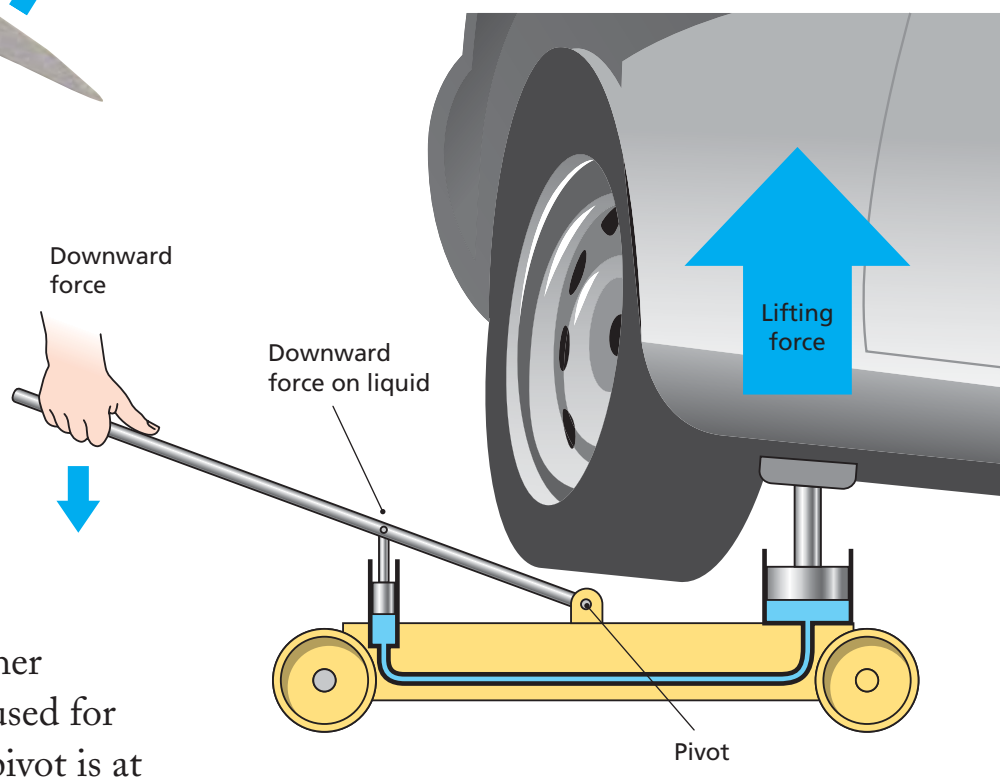


▲ **(Picture 2) A large log being levered using a small log as a pivot.**



▲ **(Picture 3) Scissors are two levers fastened together. As a result, you can use them without resting them on a surface.**

▼ **(Picture 4) A lever being used to raise a car. This kind of lever is called a jack.**



the pivot by trying to cut a piece of thick paper using just the tips of the scissors, and again using the parts closer to the pivot. It is much easier to cut the paper when it is close to the pivot.

In Picture 4 you can see another important kind of lever. This is used for lifting vehicles. In this case the pivot is at the end of the bar. The operator presses down on the bar and this squeezes liquid through a tube, pushing up a piston under the car and so lifting it from the ground.

Summary

- **A lever magnifies your force.**
- **To get more force you need a longer bar.**

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