

Science- Levers Activity Sheet

WALT demonstrate how levers work and how they reduce the force required to move objects.

Key vocabulary:

lever, pivot, push, pull, mechanism, machine, force, fulcrum - You could look up the meaning of the key vocabulary first, although they are explained below.

Equipment:

Empty tin with lid (the type of lid found on a syrup tin-see photograph below), teaspoon, long-handed wooden spoon, a second tin with lid, a board and books.

If you don't have the right equipment, which other objects could you use?

Record what equipment worked, what didn't work- this is the fun part of Science!

This week we are going to investigate the use of levers, which are types of mechanisms.

(A mechanism is something that makes doing things easier, using forces)

To start with, watch the video below.

KS2

How do levers work?

Part of Science | Pushes and pulls

Duration 02:33



<https://www.bbc.co.uk/bitesize/clips/zrp6n39>

Many everyday objects we use work using levers such as scissors, pliers and claw hammers.

These levers need a moving force to make them work.

First investigation

If you have an empty tin with a lid, which is inset, try this first investigation.



How could you open it easily? (Answer all questions on the recording sheet, or in your Home Learning book)

Try using a teaspoon. (Put the end of the teaspoon handle, not the bowl of the spoon, under the lip of the lid.)

How does the spoon work as a lever?

You used your force to push down on the spoon, which pivots on the edge of the tin.

There is an upward force on the other end of the spoon that lifts the lid. Think about the directions of forces.

In which directions are the forces working?

Where is the pivot point?

What playground item works like this?

Activity

Try to draw a diagram of the tin being opened with a spoon and label it with the appropriate vocabulary: fulcrum, lever pivots, weight arm, force arm. You might also choose to include arrows to show the direction of the forces.

Second investigation.

To help you understand what a lever mechanism is, hold the end of the handle of a long-handled wooden spoon.



Hold the handle between your finger and thumb near the same end of the spoon, so that your thumb is placed below the wood and your forefinger is placed on top of the wood.

This is the **fulcrum**, where the lever pivots.

Apply a downward force, using your hand, to the other end of the spoon as it pivots in between your finger and thumb.

What can you feel happening where you are holding the handle?

That the spoon is acting as a lever, and that this was the mechanism that helped to open the tin.

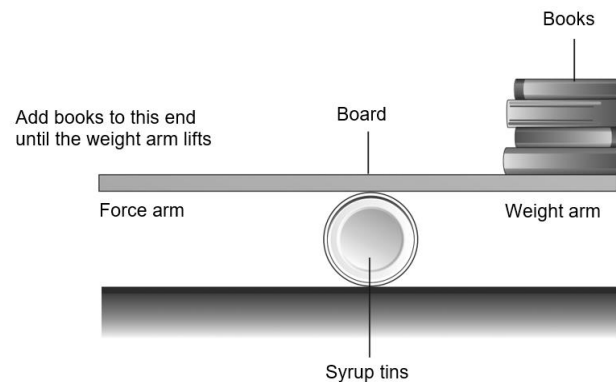
Hold the spoon at different places on the handle to feel the difference.

Can you make the spoon balance on one hand only, as if it were a seesaw?

Levers have three parts: the fulcrum, where the lever pivots; the weight arm (the part from the fulcrum to the weight to lift); and the force arm (the part from the fulcrum to where you push or pull).

Third investigation.

To investigate the effects of different lengths of a lever



Move the syrup tins to see what happens to the number of books needed to lift the weight arm.

You will need; two tins with lids (to act as the fulcrum), a board and books.

1. If you have two tins, and are able, tape the tins together end to end.
2. Rest the board across them like a seesaw and place four books on one end. This is the weight arm.
3. Add books to the pile, one at a time until the weight arm lifts, and record the number of books.
4. Repeat this twice: first making the force arm longer than the weight arm, then making both arms the same length.
5. If possible, write a sentence saying which makes it easier to move the weight: a force arm is shorter, longer than, or same length as, the weight arm.

It would be great if you could take photos to record your investigations!

Glossary

Lever: a long, sturdy body that rests on a support called a fulcrum.

Fulcrum: any pivotal point that supports the movement of a lever.

Pivot: to turn or rotate, like a hinge. or a netball player pivoting back and forth on one foot to protect the ball.

Science-Levers Recording Sheet

Experiment 1



How could you open it easily?

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How does the spoon work as a lever?

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In which directions are the forces working?

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Where is the pivot point?

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What playground item works like this?

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Try to draw a diagram of the tin being opened with a spoon and label it with the appropriate vocabulary: fulcrum, lever pivots, weight arm, force arm. You might also choose to include arrows to show the direction of the forces.



Experiment 2



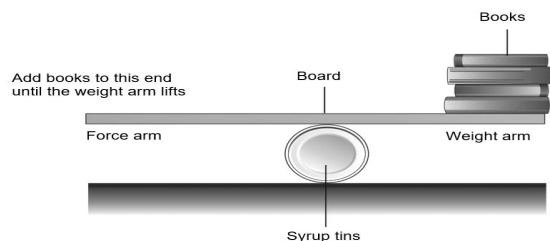
What can you feel happening where you are holding the handle?

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Can you make the spoon balance on one hand only, as if it were a seesaw? How did you make it balance?

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Experiment 3



Move the syrup tins to see what happens to the number of books needed to lift the weight arm.

Set up the experiment and make a note of any observations as you add books.

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