

# THE LEVER

## TE KAUPWHITI

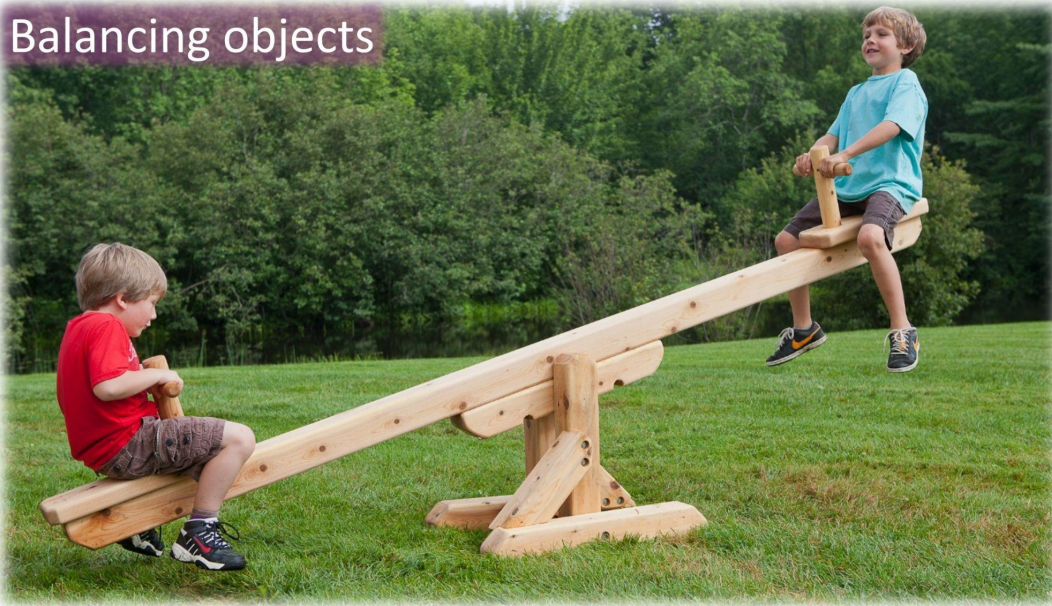
**M O T A T**

# LEVER KAUWHITI

What work does a lever do for us?

Can you think of any other uses for a lever?

Balancing objects



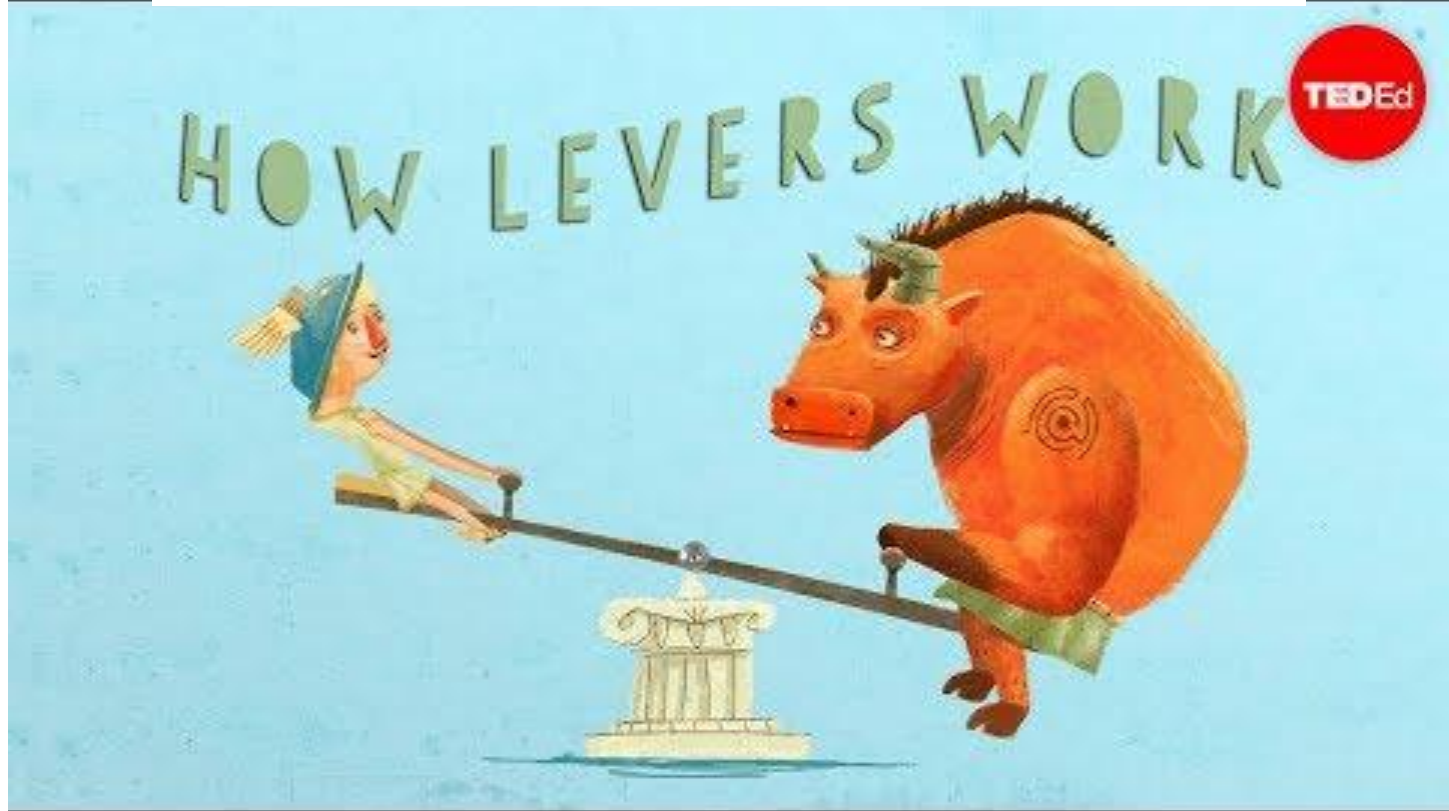
Gripping objects



Lifting objects



# USING A LEVER TO LIFT THE WORLD?



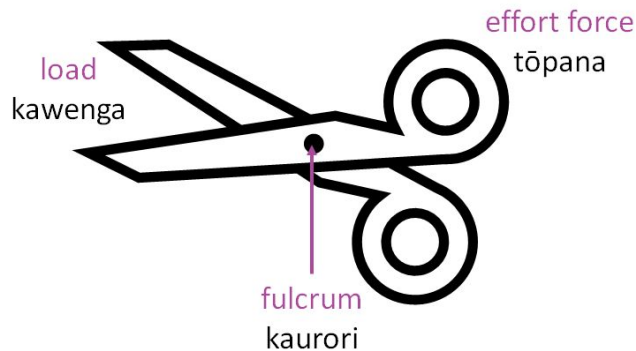
# USING A LEVER TO PUMP WATER



# LEVER KAUWHITI

Every lever has three parts: the fulcrum **kauori**, the load **kawenga** and the effort **tōpana**.

1. The **fulcrum** is where the lever pivots. It usually stays still, while the other parts of the lever move around it.
2. The **load** arm is where you put the thing you are trying to lift, move, pry, cut, press or open. It's the part of the lever that completes an action.
3. The **effort** arm is where you interact with the lever, where you put your hands.





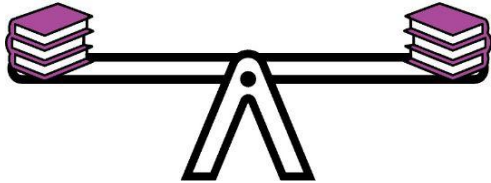
# LEVER KAUWHITI

When using a lever, the **length** of the lever matters.

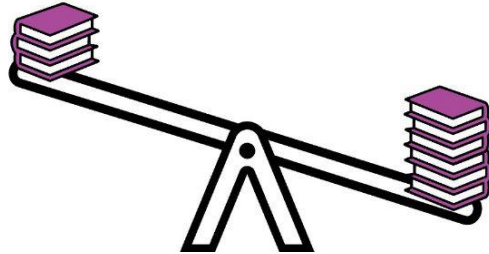
If we change the length of the arms the lever, it takes less weight on the short arm to lift the long arm of the lever.

In other words, we can lift a heavy **load** with little **effort**. All we have to do is change the length of the arms!

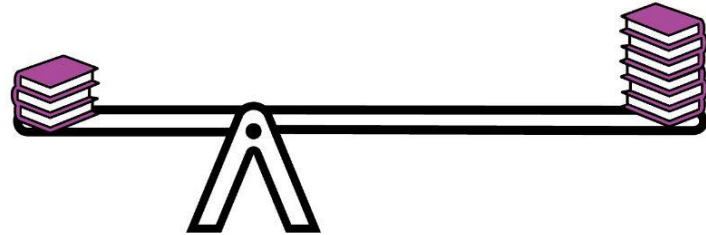
Arms are the same length:  
**3 books can lift 3 books**



Arms are the same length:  
**3 books cannot lift 6 books**



The load arm is twice as long:  
**3 books can lift 6 books**



# LEVERS IN THE BODY NGA KAUWHITI O TE TINANA

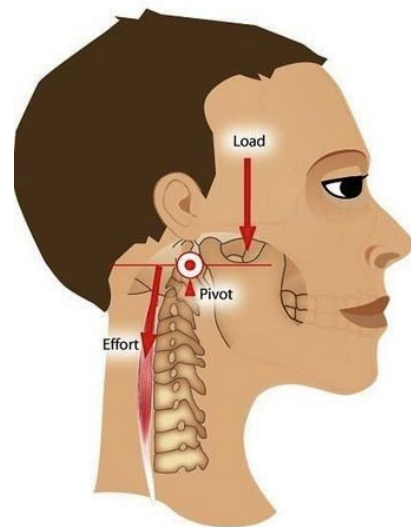
There are levers in the human body!

Think about your arms, legs, feet and jaw.

Notice how they can move around but have a fixed pivot point.

The 'effort' in our body usually has nothing to do with our hands. It comes from the expansion and contraction of our muscles.

This is called elastic potential, similar to the force of a rubber band flung across the room.



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You can learn all about the levers in the human body at the [Science Learning Hub](#)

# 3 TYPES OF LEVERS E TORU NGĀ MOMO KAUWHITI

Levers can look very different from one another, but there are just three types.

They are called (very unimaginatively) first-, second- and third-class levers.

The level of lever depends on which part is in the middle, it's that simple.

To identify a lever, simply identify the three parts, and then determine which part is in the middle.

LOAD KAWENGA

EFFORT TŌPANA

FULCRUM KAURORI



# 1<sup>st</sup> class lever

Fulcrum in the middle



## 2<sup>nd</sup> class lever

Load in the middle

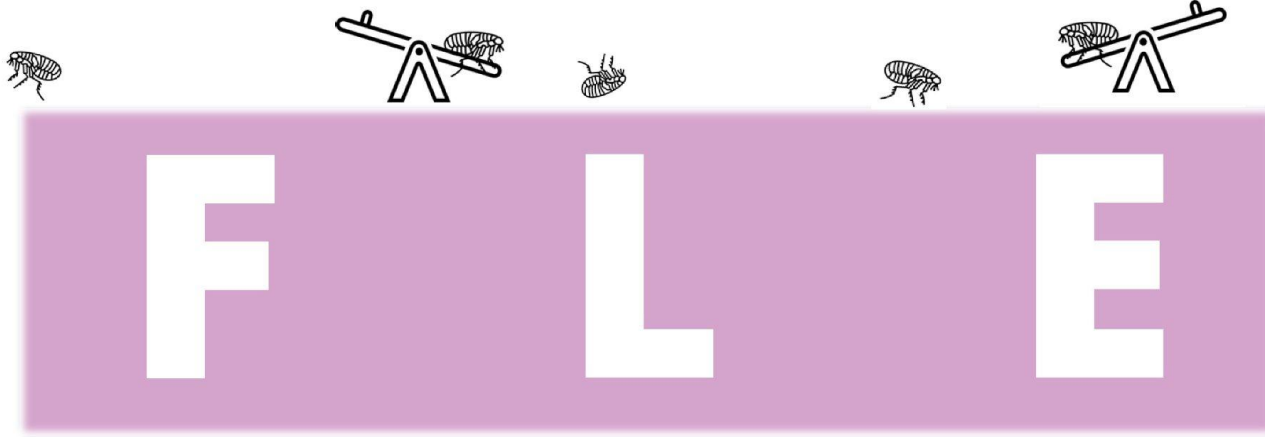


## 3<sup>rd</sup> class lever

Effort in the middle



To help you remember, use this mnemonic: F L E (flea!)



**1st  
Class  
Lever**

Fulcrum in the  
middle

**2nd  
Class  
Lever**

Load in the middle

**3rd  
Class  
Lever**

Effort in the  
middle

# TEST YOURSELF WHAKAMĀTAUTAU KOE

Look for levers in your house, think about how they help you, and what work they do.

## Can you figure out which level of lever you have?

A great place to find levers is in the kitchen, you know that one draw that is full of random utensils?  
It's also full of levers!

