



# Forcemeter

A **FORCEMETER** is an instrument that measures a pulling or pushing force. Scales are forcemeters for measuring weight.

A force, such as pulling or pushing, will make something go faster or slower, make it go in a new direction or change its shape. For example, we might drag a chair across a room. That uses pulling force. We might squash a ball. We use force to do that too.

## Measuring force

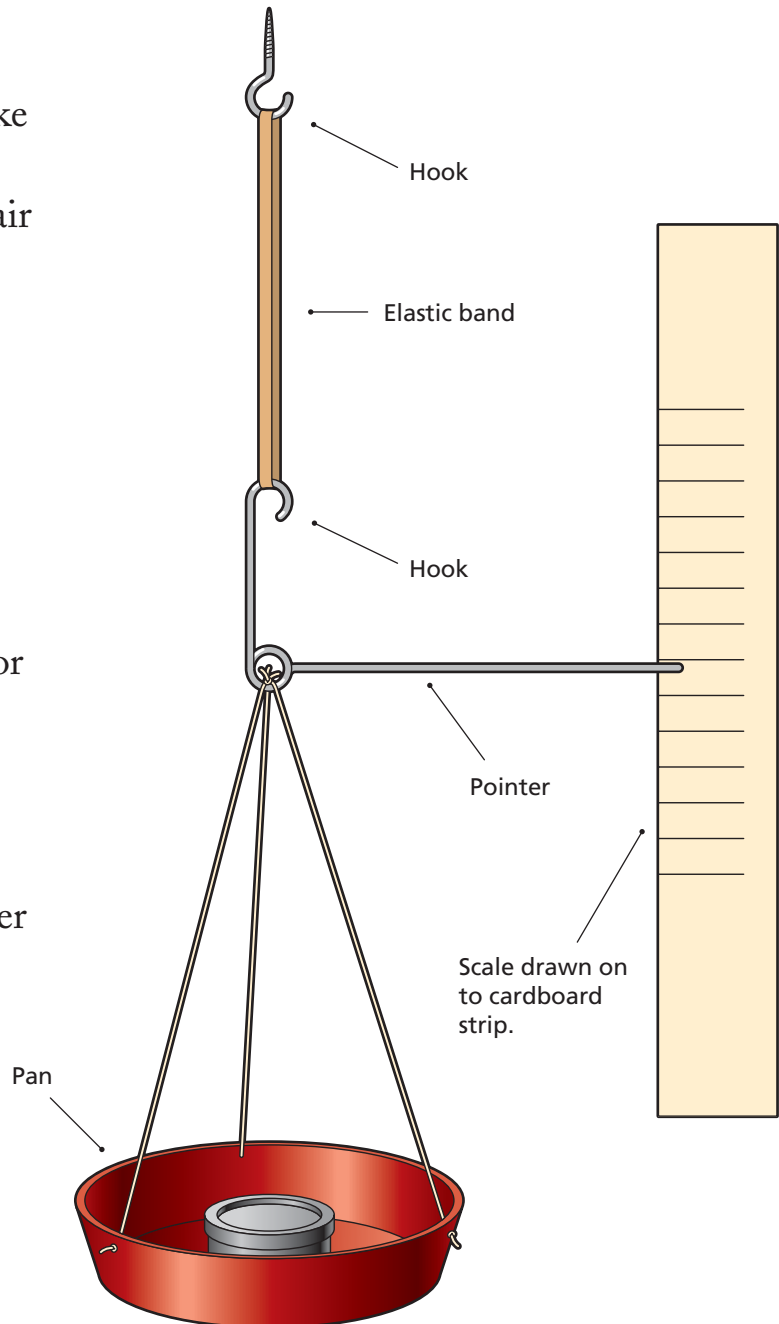
The more force we use when pulling something, such as an elastic band, the more it will stretch. We can use this principle to make a simple instrument for measuring force (Picture 1).

Each extra weight in the pan adds to the force stretching the elastic band. The more force we use, the more the band stretches and the further the pointer moves down the scale.

In this example, we have used weight as a force, but we could turn the instrument on its side to measure the force when pulling sideways.

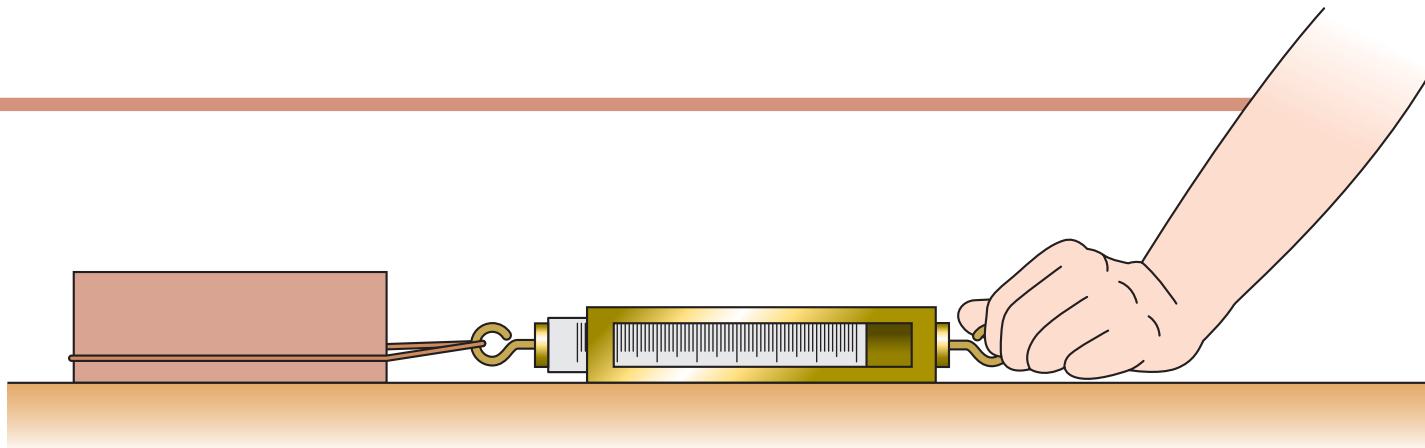
## Forcemeter

A forcemeter is a tube containing a spring and a pointer. The forcemeter can be used for measuring forces downward or sideways (Picture 2). It can also be used for measuring pushes as well as pulls. The scale on a forcemeter is marked off in units of force called **NEWTONS**.

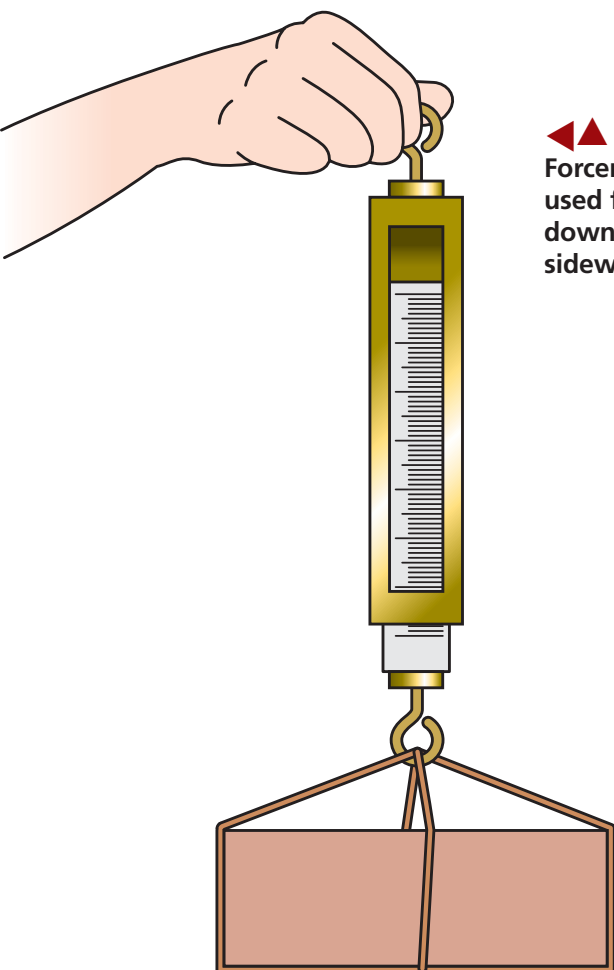


▲ (Picture 1) You can make your own instrument for measuring downward force by attaching a small pan and a pointer to an elastic band. Place a piece of cardboard next to the pointer.

Put a 100g weight in the pan and mark 1 newton (1N) where the pointer comes on the scale. Add 100g more and mark 2N where the pointer shows. By adding more weights you can make a scale.



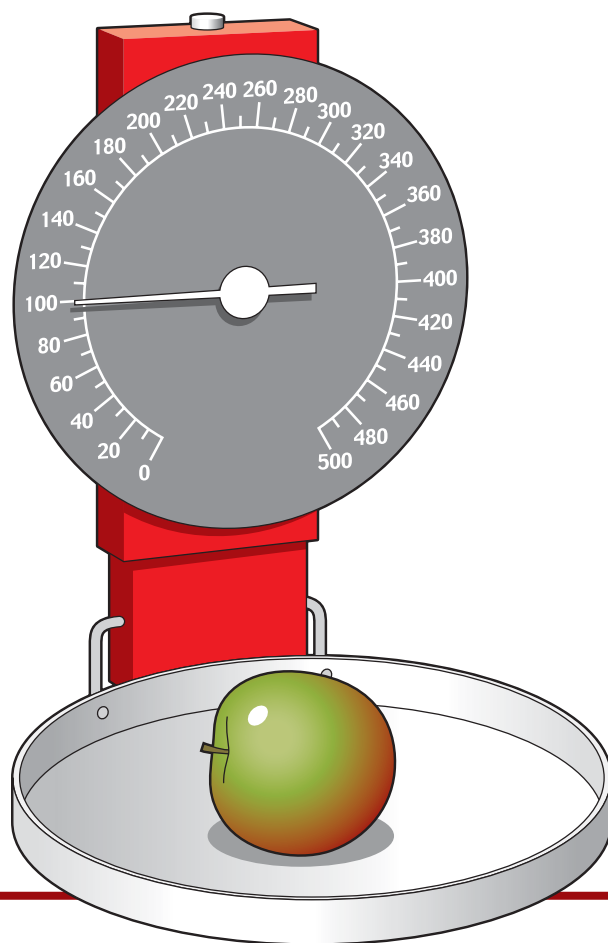
◀▶ (Picture 2)  
Forcemeters can be  
used for measuring  
downward and  
sideways forces.



▶ (Picture 3) Weighing scales are a common kind of  
forcemeter. The scale in this picture shows that the  
apple weighs 100g, which is also a force of about  
1 newton (1,000g or 1kg is about 10 newtons).

## Forcemeters around us

Shops use scales for finding the **WEIGHT** before selling you goods such as apples or potatoes (Picture 3). These scales are not marked up in newtons, but in kilograms (and for smaller weights, grams). Newtons is a more general unit that can be used for sideways and upwards pushes and pulls, as well as downwards pulls. (Kilograms can only be used for weight. A kilo is about 10 newtons.)



### Summary

- A forcemeter measures pulling force.
- Force is measured in newtons.
- When measuring weight, a kilogram is about 10 newtons.