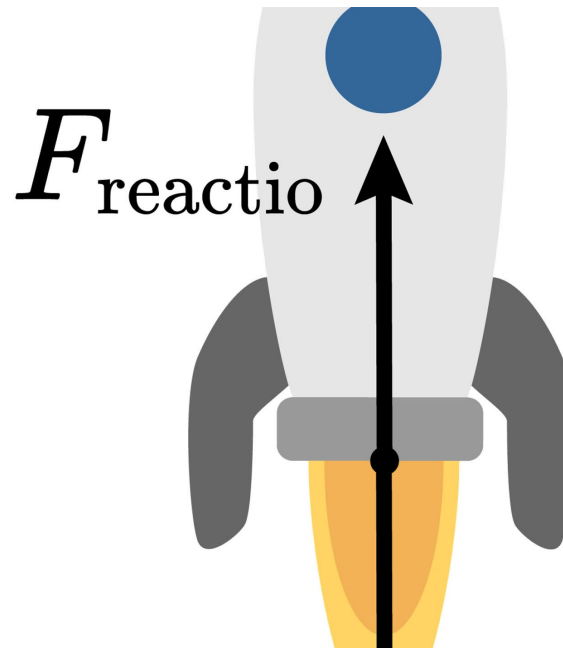


Force and counterforce



Physics

Mechanics

Forces, work, power & energy



Difficulty level

easy



Group size

-



Preparation time

10 minutes



Execution time

10 minutes

This content can also be found online at:



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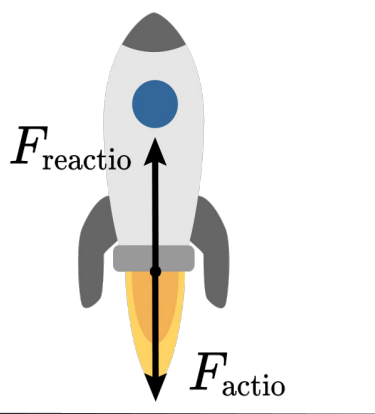
PHYWE



General information

Application

PHYWE



- The principle of counteraction also Actio and Reactio is the **Newton's third principle**.
- It states that in the interaction between two bodies, every "action" (force from body A on B) simultaneously produces an equally large "reaction" (counterforce from body B on A), which acts back on the causer of the "action"

Other information (1/2)

PHYWE

Prior knowledge



No previous knowledge required.

Principle



It is to be shown that a force acting on a body at rest always produces a counterforce of equal magnitude.

Other information (2/2)

PHYWE

Learning objective



With the help of the force gauges, it is to be demonstrated that an equal force is exerted for a given force.

Tasks



Two force gauges are connected together and the forces they exert on each other are measured.

Safety instructions

PHYWE

The general instructions for safe experimentation in science lessons apply to this experiment.

Equipment

Position	Material	Item No.	Quantity
1	PHYWE Demo Physics board with stand	02150-00	1
2	Hook on fixing magnet	02151-03	1
3	Torsion dynamometer	03069-03	2
4	Pointers f. Demonst.Board, 4 pcs	02154-01	1
5	Marker, black	46402-01	1
6	G-clamp	02014-01	2

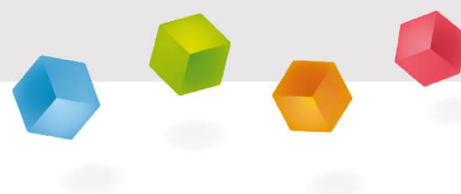
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PHYWE

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PHYWE

Set-up and Procedure



Set-up

PHYWE

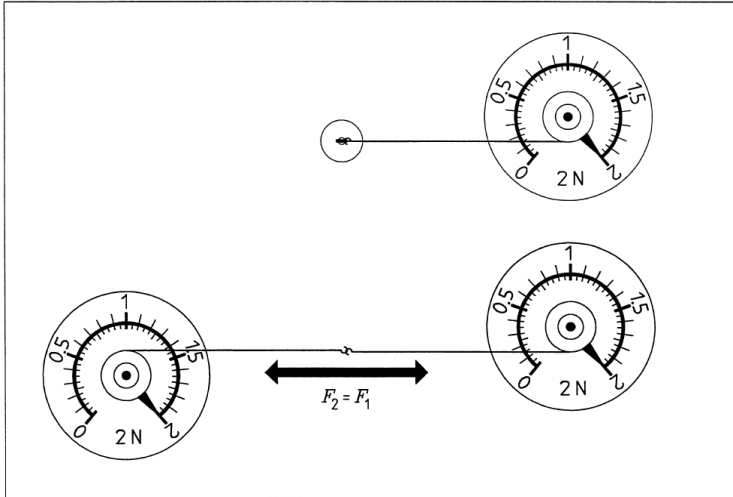


Figure 1

- Place hook on holding magnet and a force gauge on the demo board
- Attach the pull cord of the dynamometer to the hook, adjust the dynamometer and then move it to the right until it indicates 2 N (Fig. 1, upper part).
- After asking why the force gauge shows 2 N (see result (1)), place the second force gauge instead of the hook on the holding magnet, hook both pull cords and adjust the force gauge (fig. 1, lower part).

Procedure

PHYWE

- Move the left force gauge to the left until the right force gauge shows 2N again.
- Read the indicated force from the left force gauge and note it down.
- After ascertaining the result, place pointer for demo board (one red and one blue) and mark with the pen (see fig. 1, lower part).

Evaluation (1/2)

PHYWE

Observation

- The force gauge pulls with 2 N on the hook. The hook remains at rest. It obviously withstands the force of 2 N, i.e. it pulls - also with 2 N - on the dynamometer.
- The left force gauge indicates the same force as the right one, i.e. 2 N.

Evaluation:

If a force acts on a body, it always causes an equally large, oppositely directed force. This law is called Newton's 3rd law after its discoverer and is expressed in the form

force = counterforce
or actio = reactio

It is also called the law of interaction.