

A Newton's cradle with five silver spheres hanging from a metal frame. The background is a dark, blurred gradient.

(ENG) Draw Forces

Introduction

Step 1 - Motivational Stage

Step 2 - Investigational Stage

Step 3 - Consolidation Stage

Introduction



#Online activity #In-class activity #Inquiry-based learning
#Experiential learning #Paintings

Naming and drawing laws of physics

Learning Objectives



test drawing forces

ACTIVITY DETAILS

Activity Details

Connection of the activity with Art —

Portrait painting



Link to local, national School Curriculum —

Forces/ Drawing forces



Equipment required —

- Internet connection



Duration of activity —

45 minutes



Sources —

Step 1 - Motivational Stage



You can ask a motivational question to encourage brainstorming in class



"What forces affect us and the world around us?"

Step 2 - Investigational Stage



Present to the pupils the list of forces below and tips for drawing them.

i Remind them that most of a person's energy is spent to overcome gravity.

NAMING FORCES

DRAWING FORCES

Remote interactions:

- Weight
- Electric power
- Magnetic force

Touch interactions:

- Friction
- Supporting forces
- Tension force of the thread
- Lift
- Spring power
- Air resistance / medium resistance

NAMING FORCES

DRAWING FORCES

The force vector starts or ends at the impact point:

- weight to the center of the piece
- friction between surfaces
- lift in half of the sunken part

Direction of force vector:

- weight towards the center of the earth
- support force at an angle of 90 degrees to the surface

If the body is at rest or moving at a constant speed, the total force, i.e. the sum of the forces, is zero.

If the body is in accelerating motion, the sum of the forces is in the direction of acceleration.

In general, only the forces acting on one object are drawn in the force diagram. In this way, the force and its counterforce do not mix with each other and appear to be directed at the same object.

STUDENTS' TASKS

1

Task 1

Draw together with the pupils all the possible forces for the situation where the frog jumps from the surface of the pond.

2

Task 2

Tell the story of Newton and the apple with the pupils. Remind them that the story is so good that it doesn't need to be true. Newton may have just seen the apple fall, but the story of the apple hitting his head is easier to remember.

Pupils can search the Internet for memes related to the topic.

Task 3 (for fast learners)

Tell the pupils to search the internet for portraits of Isaac Newton and recreate the moments of Newton's famous discoveries using photo editing apps.

Pupils can also think how famous people of their own country are presented:

- what kind of expression they are having (solemn, smiling?)
- what kind of clothes he is wearing
- if there are props in the painting, what are they and why
- what does the choice of frame tells us about the subject of the portrait

Step 3 - Consolidation Stage



Pupils come up with situations related to forces that are more complicated than a frog's jump and present them to each other. Together they name all the forces in the situation.

End of the activity

EXIT