(ENG) Not so fast, please

Introduction

Step 1 - Motivational Stage

Step 2 - Investigational Stage

Step 3 - Consolidation Stage

Introduction

#Online activity #In-class activity #Experiential learning #Artwork #Paintings #Gamified activity

Movement surrounds us all the time.

What are the different types of movement? Pupils will learn about movement and speed from previous knowledge and experiences. They will understand what straight steady movement is and describe straight movement and movement in curves. Through the observation of artworks, they will understand the speed and will know how to calculate speed if they have information about time and path.

Learning Objectives

- [ ] Recall the knowledge of movement from past lessons.
- [ ] Describe different types of movement of an object.
- [ ] Interpret graph of steady straight movement.

ACTIVITY DETAILS

Activity Details

Connection of the activity with Art

Realistic paintings, drawing

Link to local, national School Curriculum

Accelerated motion & Newton's second law/ Description of movement and straight steady movement and repetition

Equipment required

- Blank paper,
- pencil,
- toy car.

Duration of activity

45 minutes

Sources

Beznec, B., Cedilnik, B., Gulič T., Lorger J., Vončina, D. (2021). Moja prva fizika 1, učbenik za fiziko v 8. razredu osnovne šole

Repnik R., Svetec M., Jug N., Ahčin T., Bezjak G., Jagličič Z., Gosak M. (s.a.), Fizika 9, i-učbenik za fiziko v 9. razredu osnovne šole
Retrieved from: https://eucbeniki.sio.si/fizika9/index.html

National Gallery of Art, Washington,
Retrieved from: https://www.nga.gov/collection/art-object-page.30228.html

National Ocean Service,
Retrieved from: https://oceanservice.noaa.gov/facts/nautical-mile-knot.html

Photo credit:
Photo 1: own

Photo 2
Winslow Homer (1836–1910)
Taking on Wet Provisions (Schooner Marked Newport, K. W.), 1903
watercolor and graphite on off-white wove paper, 35.2 x 55.2 cm
Public domain
Amelia B. Lazarus Fund, 1910
The Metropolitan Museum of Art, New York
Source: https://www.metmuseum.org/art/collection/search/11143?ft=winslow+homer&offset=0&rpp=40&pos=24

Photo 3:
Winslow Homer (1836–1910)
Breezing Up (A Fair Wind), 1873–1876
oil on canvas, 61.5 x 97 cm,
Public domain
Gift of the W. L. and May T. Mellon Foundation
Courtesy National Gallery of Art, Washington
Source: https://www.nga.gov/collection/art-object-page.30228.html

Step 1 - Motivational Stage

Start a discussion with your pupils.

There are different types of cars in the world. Some are very fast, some are designed to ride around the towns and are usually slower. A lot of cars can drive up to 200 km/h. Highways have the highest speed limits.

Ask pupils:

"What is the speed limit in your country on different types of roads? "

"In your opinion – is 200 km/h fast or slow?"

Step 2 - Investigational Stage

STUDENTS' TASKS

1

Task 1

Ask pupils to draw three different tracks for their toy car. Now they ride the car on these tracks. They observe the movement of the car and describe it. Ask these questions:

“ Did the car go straight? Did it move in curves? Did your car go fast or slow? Were there any parts of the track where it had to go slower? Did the car move evenly or unevenly?”

2

Task 2

Say to your pupils:

Let’s say you moved your car evenly and that it drove 5 cm in 1 second. Draw a graph with these specifics up to 30 cm.

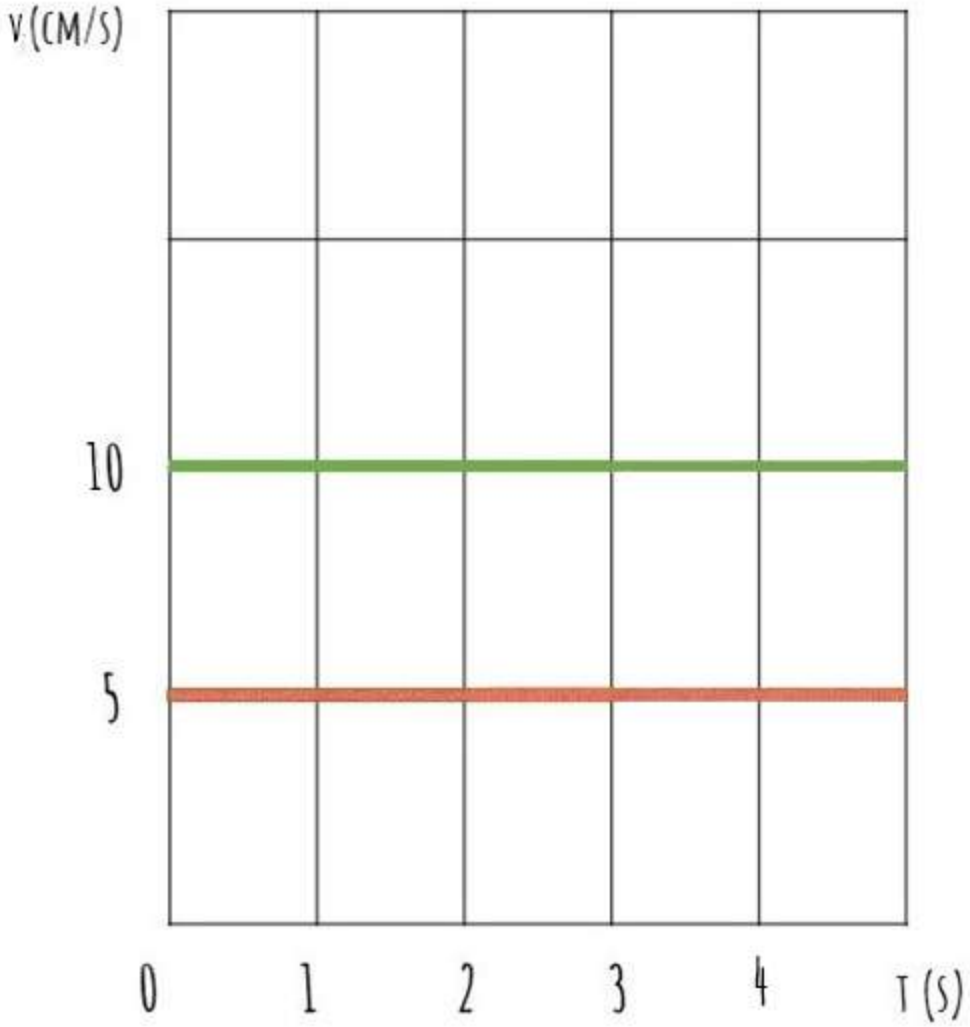
“What does your graph look like? How many seconds did it take your car to reach the 30-cm mark?”

3

Task 3

Give the pupils an additional task:

In another try your car moved at a different speed. When you compare both speeds, the graph of the speed looks like this (show pupils the graph):



Ask the pupils:

"What does the graph say? In which case did the car move faster?"

Task 4

Show the pupils the pictures below:

Winslow Homer, Taking on Wet Provisions (Schooner Marked Newport, K. W.), 1903, Watercolor and graphite on off-white wove paper, Amelia B. Lazarus Fund, 1910, The Metropolitan Museum of Art, New York

Winslow Homer, Breezing Up (A Fair Wind), 1873-1876, oil on canvas, 61. 5 x 97 cm, Gift of the W. L. and May T. Mellon Foundation, Courtesy National Gallery of Art, Washington

Ask them:

"Describe what you see in pictures. In your opinion, which boat goes faster? What do boats have in common with cars?"

Explanation

The works of art in front of you are made by an American artist Winslow Homer, one of the most well-known representatives of the artistic movement called Realism. The aim of Realism was to depict motifs from everyday life without exaggeration and unnecessary decor. Artists were interested in people, and their way of living in a truthful way and were striving to present this way faithfully in their works of art. The artist of these pictures is known for his interest in marine subjects. The second picture is even said to be the most famous of his artworks.

Ask the pupils:

"Do you know which measure unit is used for a speed in nautics?"

Explanation

In the 17th century, sailors measured the speed of their ship using a device called a "common log." The common log was a rope with knots at equal intervals. The rope was attached to a piece of wood shaped in a triangle. They lowered the wood piece into the water, and it floated freely behind the ship for a specific amount of time, measured with an hourglass. When the time was up, they would count the knots between the ship and the piece of wood. The number gave them the information of the speed of their ship.

We can calculate speed using this formula:

v = s/t

Speed is the quotient of path and time.

Task 5

Show pupils the following video:

Question 1

Oto travels in his boat at a constant speed of 37,2 km/h.

How many km does his boat travel in 193 minutes?

Answer: 119,7 km

Question 1

Oto needed 4 minutes to travel 1300 m.

What was the average speed of his boat?

Answer: 5,4 m/s or 19,5 km/h

Step 3 - Consolidation Stage

Ask pupils a question to initiate discussion:

"What is the difference between straight steady movement and unsteady movement?"

Ask pupils to solve the following:

"If the car drives 130 km/h, how many metres does it drive per second?

Hint: 1 m/s is 3,6 km/h."

- **Answer: 36,11 m/s**

"Think of other devices that have the same function for people as cars and boats. Which one is the fastest and why?"

End of the activity

EXIT