

SCENARIO		
Title	<b>Uneven linear motion</b>	
Summary	Students learn the concept of nonuniform motion, the concept of average and instantaneous speed. They will learn to plan tasks to determine the average speed. On the basis of experience, they will learn to read and make graphs of speed versus time versus time.	
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Didactic objectives
<p><b>General objectives:</b></p> <ul style="list-style-type: none"> <li>- introduction of the concepts of average speed and instantaneous speed in non-uniform motion,</li> <li>- exercise in drawing and analyzing charts.</li> </ul> <p><b>Specific lesson objectives:</b></p> <ul style="list-style-type: none"> <li>- Students will be able to:</li> <li>- use physical quantities: path, speed, time, to describe uneven straight line motion; point out examples of this movement in the surrounding reality,</li> <li>- distinguish between average and instantaneous speeds in non-uniform traffic,</li> <li>- use the concept of average speed to solve simple calculation tasks,</li> <li>- prepare a graph of speed versus time, analyze a graph and make conclusions.</li> </ul>
Physics    Mathematics <input type="checkbox"/> Computer science <input type="checkbox"/> Robotics <input checked="" type="checkbox"/> Programming <input type="checkbox"/>
Educational level:    10-12 years old <input type="checkbox"/> 12-14 years old <input checked="" type="checkbox"/>

### Problem Statement

- What is rectilinear motion?
- What is the average and instantaneous speed and what are their units in the SI system?
- How to determine the average speed?

### BOM (Bill Of Materials needed)

- computer station
- LEGO MINDSTORMS EV3 robot.

### Activity description

1. Organizational and organizational activities
2. Introduction to the topic - a reminder of the basic concepts describing movement.
3. Performance demonstration examining uniform motion.
4. Introduction of the concepts of average speed and instantaneous speed and formulas for calculating these quantities.
5. Discussion of the differences between these two quantities.
6. Exercise in reading and drawing graphs of speed versus time and distance versus time
7. Planning and conducting by the students an experiment on determining the speed of movement, e.g. during walking, running (working in groups)
8. Practical exercises - working with the LEGO MINDSTORMS EV3 robot.
  - measuring the path the robot will take at the same time when its speed changes,
  - creating a table of the length of road sections traveled by the robot at equal intervals.
9. Summary and end of the lesson.

### Resources

„InnoExperiment – Innovative Approach to Teaching through Experiment”  
Project Leader: Zespół Szkolno – Przedszkolny w Goniądzu (ZSP)



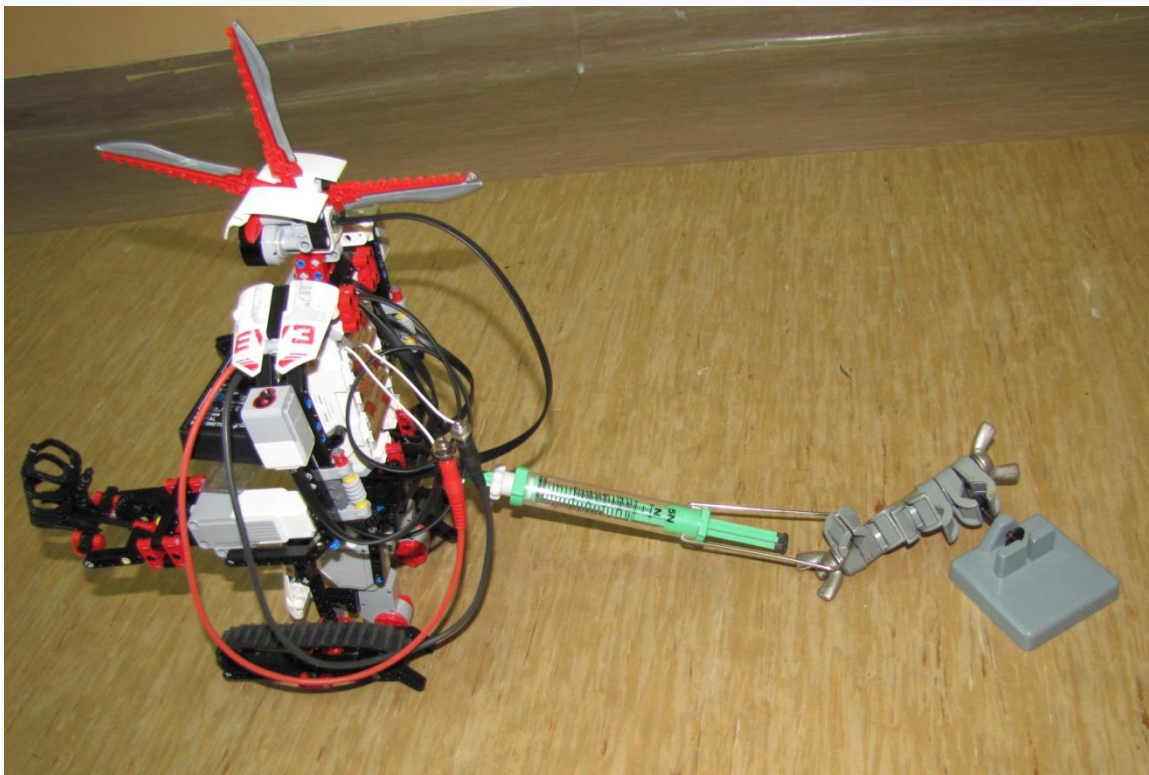
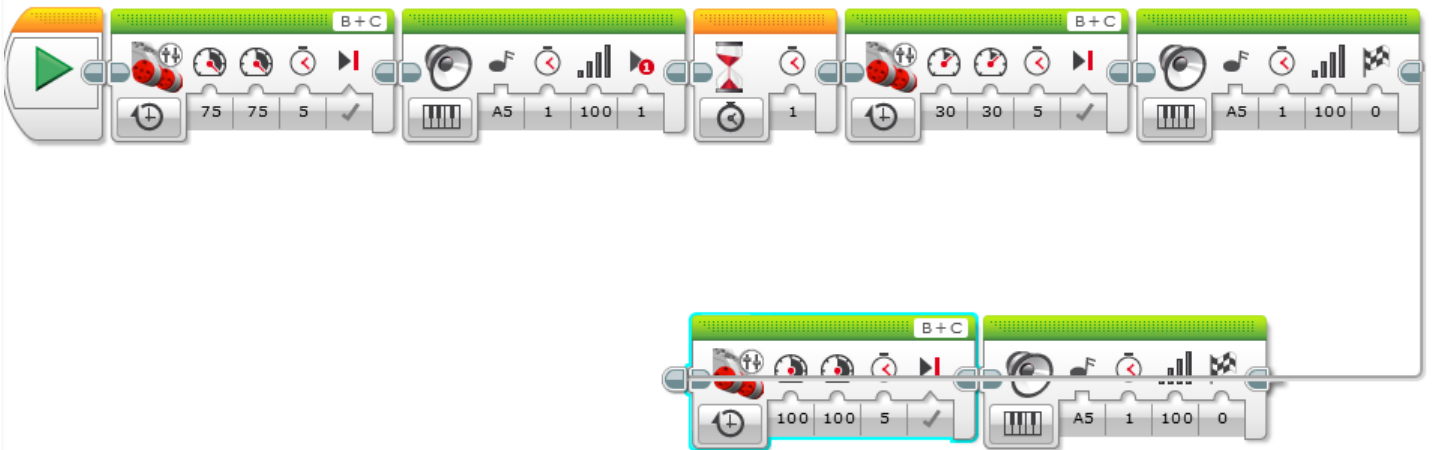


Erasmus+



InnoExperiment

INNOVATIVE APPROACH TO TEACHING THROUGH EXPERIMENT



### Students' Evaluation

The student will be assessed for commitment and proper performance of tasks.

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### Bibliography

Meetings with physics - Physics textbook for the seventh grade of primary school Authors: Grażyna Francuz-Ornat, Teresa Kulawik, Maria Nowotny-Różańska

<https://www.robocamp.pl/pl/lego-mindstorms-ev3-wersja-domowa-edukacyjna/>

### Scalability

Script modification and improvement.

### Moreinformation

Solving tasks using the program.

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