

Didactic Scenario

1. Title

Marble run

2. Keywords

Gravitation, construction, ball

3. Basic Information

STEAM Subject: science, engineering, math

Typical interaction time with the instructional scenario in teaching hours for in-school work:
45 minutes

General description of the scenario:

<u>Phases</u>	<u>Stage</u>	<u>Time</u>
Introduction	Preparation	8 minutes
Main part	Implementation	33 minutes
Conclusions	Evaluation	4 minutes

Age group: 10 years old

Estimated difficulty level:

Very Easy	Easy	Moderate	Challenging	Very Challenging
			X	

Teaching resources

Material: slides, worksheets, LEGO blocks, very small balls, meter, markers

School infrastructure: Media, Computer

Additional material from external sources/online tools: N/A

Differentiated Instruction for students of differing abilities and learning styles in the same class: N/A

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4. Educational Problem

Marble runs and gravity provide a practical and engaging platform for learning and problem-solving. They help individuals, especially students, develop a deeper understanding of physics concepts while promoting skills such as critical thinking, spatial reasoning, teamwork, and creativity which are very important these days.

5. Learning Objective (-s)

1. Build a marble run's track;
2. Measure marble run;
3. Documenting their own learning process;
4. Teamwork;

6. Phases of the Scenario

Phase 1

Title: Introduction - Slides about marble run

Indoor	Outdoor	Mixed
X		

Phase duration in minutes: 8 minutes

Detailed description of the scenario phase:
The teacher shows the slides.
Slides:
-marble ball from different materials;
-marble game (can be showed less than all video);
-gravitation, what is it?
- Marble run and how is gravity working in marble run? Marble run examples in the world (what materials are used?)
TASK:
-To build a marble run using LEGO blocks in the groups of 3 - 4.
- The height of the track is at least 15 cm.
- One turn or more.
- use the stairs method.

Activity sheets: Before building Marble runs, children write their guesses how they will manage to do marble run challenges in their worksheets.

Phase 2		
Title: Main part		

Indoor	Outdoor	Mixed
X		

Phase duration in minutes: 33 minutes

Detailed description of the scenario phase:
Children build their marble run's track.
Write in their worksheets. Measure

Activity sheets: Activity Sheet attached

Phase 3		
Title: Conclusions - reflection		

Indoor	Outdoor	Mixed
X		
Phase duration in minutes: 4 minutes		
Detailed description of the scenario phase: At the end of the activity all children watch marble run tracks of other teams. Teacher with children discuss their work - what problems arose and what you are happy about?		
Activity sheets: N/A		

7. Evaluation Methodology

Students are motivated to take an active part in the various stages of learning. Assessment components include: active participation in activities, worksheet tasks, building marble run model and conducting an experiment.

8. Additional Resources for the teacher

Attached slides and an example of the worksheet.

*This activity can be done longer if you want to build longer marble runs and also calculate with children the speed of the ball's running.