

Didactic Scenario

1. Title

Siirt Golden Gate

2. Keywords

Rope, bridge, construction, transportation

3. Basic Information

STEAM Subject: Engineering, Maths, Technology, Science, Art

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

General description of the scenario:

The objective for students is to observe the advantages of simple machines in daily life and to understand the working principle of suspension bridges, of which there are many examples in daily life.

Phases	Stage	Time
Introduction	Preparation phase	15'
Implementation	Implementation phase	40'
Evaluation	Evaluation phase	25'

Age group: 9-12 years old

Estimated difficulty level:

Very Easy	Easy	Moderate	Challenging	Very Challenging
		X		

Teaching resources

Material:

- Wooden Lath (5x5x150 Cm 7 Pieces)
- Screw (50 pieces)
- Rope 6 mm 20 Meters- 5 lt su
- White Glue 0.70 kg
- Fixed reel 3 pieces
- Poster 2 pieces
- Spray dye (500 ml.)

School infrastructure: Smartboard, desks, projector

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

In the suspension bridge setup, fixed pulleys of three different lengths are attached to the pillars used as bridge towers. One end of the ropes that are used to represent the rope carrying the bridge is fixed to one of the bridge towers, while the other is passed through the fixed pulley at the same height. A water bottle is tied to the bridge to make it heavy. After giving brief information about the construction of suspension bridges with posters suitable for the topic prepared in advance, students are asked to pull the ropes carrying the bridge in turn. They are asked in which case transportation is more comfortable and what is the reason for this.

5. Learning Objective (-s)

1. Students learn the type of people travelling types in their country
2. In the study, it is asked in which situation transportation is more comfortable and the reason is considered.
3. Students get awareness on the types of transportation and geographical difficulties.

6. Phases of the Scenario

Phase 1

Title: Introduction

Indoor	Outdoor	Mixed
X		

Phase duration in minutes: 15 minutes

Detailed description of the scenario phase:

In this engaging educational activity designed for elementary school children, students will be introduced to the concept of simple machines through the use of suspension bridges. The session will start with a brief discussion about different types of bridges and their purposes, emphasizing the importance of suspension bridges in supporting heavy loads. Students will then learn about the basic components of suspension bridges, including ropes and bridge towers. This introduction will provide the necessary background and spark interest by highlighting how engineers use these principles in real-world applications to solve problems and build structures that can carry substantial weights.

Activity sheets: N/A

Phase 2

Title: Impementation

Indoor	Outdoor	Mixed
X		

Phase duration in minutes: 40 minutes

Detailed description of the scenario phase:

During the implementation phase, students will engage in hands-on experimentation with pre-prepared suspension bridge setups. These setups will feature ropes of three different lengths and corresponding bridge pillars. Working in small groups, students will first predict how the length of the rope might affect the bridge's ability to carry a load. They will then test their hypotheses by placing weights on the bridge and observing the results. As they extend the length of the lever (rope), they will see how it influences the force required to carry the load. Through this interactive experience, students will gain a practical understanding of the formula $\text{Force} \times \text{lever} = \text{Load} \times \text{lever}$, directly observing how a longer lever reduces the force needed to

lift or support a load, thereby reinforcing their understanding of the second type of lever in simple machines.

Activity sheets: N/A

Phase 3

Title: Evaluation

Indoor	Outdoor	Mixed
X		

Phase duration in minutes: 25 minutes

Detailed description of the scenario phase:

In the evaluation phase, students will come together to discuss their findings and reflect on the activity. They will compare their initial predictions with the actual results, fostering a deeper understanding of the principles they have learned. Teachers will guide the discussion, encouraging students to articulate what they observed and why the longer rope made it easier to carry the load. This phase will also include a Q&A session where students can ask questions and clarify any doubts. To reinforce learning, students might be asked to draw diagrams or write short explanations of how the suspension bridge works, using the concepts of force and leverage. This reflection and discussion will help solidify the students' grasp of the concepts and provide an opportunity for teachers to assess their comprehension and address any misconceptions.

Activity sheets: N/A

7. Evaluation Methodology

Participants observe an example of a type 2 lever, which is one of the simple machines used in daily life. Teachers may use any type of evaluation for their students!

8. Additional Resources for the teacher

N/A