

Didactic Scenario

1. Title

Adventures with Simple Machines: Rope and Ice Catching Game!

2. Keywords

Science, gamification, nature, experiment.

3. Basic Information

STEAM Subject: Engineering

Typical interaction time with the instructional scenario in teaching hours for in-school work: 60 minutes

General description of the scenario:

Phases	Stage	Time
1	Introduction	5 minutes
2	Preparation	10 minutes
3	Game Progress	20 minutes

Age group: 6 – 11 years old

Estimated difficulty level:

Very Easy	Easy	Moderate	Challenging	Very Challenging
		X		

Teaching resources
Material: 2 tables or chairs (one for each side) Thick rope or rope pieces Ice cubes or frozen fruit pieces (for the catching version of the game) 2 plastic buckets or bucket-like containers (one for each side)
School infrastructure: Not required.
Additional material from external sources/online tools: Materiale aggiuntivo da fonti esterne/strumenti online: https://edheads.org/play-simple-machines/
Develop by: Jaqueline Rinaldi - CEIPES

4. Educational Problem

This activity aims to teach students how to measure time and design a sundial by observing the movement of the sun and the formation of shadows. Students combine their scientific, mathematical, and design skills by creating a sundial that operates based on the movement of the sun. The activity focuses on direct observation, data collection, and analysis. It also helps students understand the basic concepts of the sun's movement and the angle of sunlight, fostering their interest in the sciences.

5. Learning Objective (-s)

1. Understand the importance of clean water and the challenges of water contamination.
2. Learn about the process of water filtration and the basic engineering principles involved in designing a filtration system.
3. Acquire problem-solving and critical thinking skills as they construct their water filtration devices.
4. Collaborate with their peers to test and improve their filtration systems, promoting teamwork and communication.

6. Phases of the Scenario

Phase 1

Title: Introduction

Indoor	Outdoor	Mixed
	X	

Phase duration in minutes: 5 minutes

Detailed description of the scenario phase:

Briefly explain what simple machines are and how they work.
Tell the students that they will better understand these physical principles by playing the "Rope and Ice Catching" game.

Activity sheets:

Phase 2

Title: Preparation

Indoor	Outdoor	Mixed
X		

Phase duration in minutes: 10 minutes

Detailed description of the scenario phase:

Divide the class into two teams and designate each team to one side.
Give each team a table or chair and a plastic bucket. Draw a line in the middle and position each team on one side of the line. Stretch a thick rope over the line between two buckets, letting it hang down from the edges of the buckets.

Activity sheets:

Phase 3

Title: Game Progress

Indoor	Outdoor	Mixed
	X	

Phase duration in minutes: 20 minutes

Detailed description of the scenario phase:

Place the players of each team on their respective side of the line.
Players should try to throw or swing the rope (like cutting paper with scissors) to the other side's bucket.
Players from the opposing team should try to block the rope using their hands or another rope.
If a player successfully gets ice or frozen fruit into the other side's bucket, they earn points.
Rotate the teams' positions and continue the game, then declare the team with the most points as the winner.

Activity sheets:

7. Evaluation Methodology

15 minutes

Discuss with the students how the game works and which physical principles are involved. Emphasize the practical applications and importance of simple machines in daily life.

Outcome:

This scenario allows students to learn by experiencing physical principles and developing teamwork skills. The "Rope and Ice Catching" game provides an enjoyable learning experience, helping students understand how simple machines work and increasing their interest in STEM subjects. Additionally, it supports students' problem-solving, communication, and collaboration abilities.

