

Lilliputian Engineers: Teacher's Notes

Lesson Plan Title	Crane
Lesson Objectives	<p>Aims</p> <ul style="list-style-type: none"> • Children will learn about the function of the pulley and the different constructions where it is used. • They will experiment with various weights. • They will be introduced to concepts such as gravity, forces, rotation, motion transmission, and recycling. • They will be engaged in hands-on experimentation. • It indirectly promotes environmental consciousness. <p>Detailed Lesson Plan</p> <p>Video: We start the lesson with a video in order to introduce children to the topic of our lesson and spark their curiosity. The aim is to get them thinking about the subject and encourage them to come up with their own questions.</p> <p>Slide 2: Prompt is a fundamental principle in preschool education to get children involved in an activity. It is the primary reason for engaging in construction afterward.</p> <p>We introduce the story (problem-solving) of Sam and Sara and show a picture. Sam and Sarah love nature and always make sure to recycle. That's why they have three big bins in their garden - one for plastic, one for glass, and one for paper. All three bins are full, but they can't lift them because they are very heavy, and they need to take them to the recycling center. Can you help them build a crane that will lift the bins?</p> <p>Slide 3 and 4: Real-life Relevance</p> <p>We begin by showing the picture of various cranes and discussing with the children why people came up with the idea of building a crane. How does it help us? What are the different parts it consists of?</p> <p>Then we ask the children to think and show us which pieces they might need from the box to build the crane. This real-life connection helps the children understand the practical</p>

applications of cranes and encourages them to engage in problem-solving and hands-on construction.

Construction

Construct a car with a steering wheel that will have:

- pulleys and gears to lift objects,
- wheels for mobility,
- the ability to be raised and lowered manually

Following the instructions on the upcoming slides, the children will build the car with a steering wheel.

Experimentation

- How does the crane move?
- Which parts of the crane move?
- How do the gears and pulleys move?
- Can it lift objects?
- What would happen if it had to lift a light and a heavy object? Give it a try.
- Do you think the bin with glass, plastic, or paper is heavier? I'm using three balls of the same size, one made of glass, one of plastic, and one of paper, so that the children can understand the different weights of each material. After they "weigh" each one with their hands, ask them again what they think about the bins.
- Let's have a short discussion about recycling. Do you think it's important to recycle and why?

Extension Activity

We divide the children into three groups. Each group recycles a different material. Glass (green bricks), plastic (red bricks), and paper (yellow bricks).

Each group has a crane with a plastic bag hanging from its hook.

On one side, there is a pile of bricks of different shapes that correspond to the materials and colors.

Each child from each group should simultaneously put in the bag as many bricks as it can hold of the correct color and transport them to the recycling center.

Whichever group manages to collect the most within 2 minutes is the best recycling team.

It is important to convey the message of recycling to children even in such a polluted environment. Perhaps some children, in

	<i>the future, having such stimuli and combining their studies with ecological awareness, will be able to achieve innovative things in this field</i>
--	---

VOCABULARY: DEFINITIONS

Pulley: A pulley is a rotating circular disk that is centered on an axis passing through its center and perpendicular to its plane.

Motion transmission: The transfer of motion, either in terms of position or velocity, from one object to another.

Weight: The weight of an object is typically considered as the force exerted on the object due to gravity.

Gravity: It is the property of material bodies to attract and be attracted mutually by other material bodies.

Rotation: Rotation, or rotational motion, refers to the motion in which an object changes its orientation in space. In this type of motion, there is an axis around which all points of the object rotate. This axis is called the axis of rotation.

Recycling: Recycling is the process by which partially or completely used materials, which are indirectly or directly a result of human activity and are no longer useful in their current form, are reused. In this process, waste materials are typically transformed into raw materials from which new goods are produced.

CONCEPTS OF NATURAL SCIENCES

SUMMARY

Introduce the story of Sam and Sarah.

Using real-life images and facilitating discussions that relate to the construction activity is important for children to understand the connection between what they are building and its relevance to real life.

Construction: Detailed instructions provided in a PowerPoint presentation, guiding the children through the construction process.

Experimentation: Asking questions and experimenting to find the answers.

Extension of the activity: Recycling game

REQUIRED MATERIALS & VISUAL AIDS

ESM Box

PowerPoint

Balls: plastic, paper, glass

Plastic bags