

Ramping Racers	Grade 2 - Simple Machines and Movement
<h1 style="color: #1a3d4d;">Lesson Plan</h1>	
<p>Learning Outcomes</p> <p>Critical thinking and problem solving Self-directed learning</p>	<p>Specific Expectations</p> <p>Grade 2 – Simple Machines and Movement D1.2 assess the impact on the environment of technologies that use simple machines to facilitate movement D2.3 identify the six basic types of simple machines: lever, inclined plane, wedge, pulley, wheel and axle, and screw D2.4 describe ways in which each type of simple machine is used in daily life to make tasks easier</p>
<p>Description</p> <p>In this lesson we introduce 2nd-grade students to the concept of simple machines, specifically focusing on the "wheel and axle." Students will engage in hands-on activities to design and construct small cars using everyday materials. Additionally, they will create incline planes (ramps) with varying course materials to test and observe the functionality of their rolling racers over different materials. This lesson should be run over two sessions.</p>	
<p>Materials</p> <ul style="list-style-type: none"> • Toilet paper tubes • Straws • Toothpicks or skewers • Bottle caps • Craft sticks • Cardboard • Used cereal boxes • Paper • Tape • Scissors • Glue • Markers • Hot wheel or similar toy car (for demonstration) • Modeling clay (play dough) • Measuring tape 	

Introduction

Have a brief discussion on different types of machines they see all the time (bicycles, wheelbarrows, can openers, cars etc.).

Discuss the difference between simple machines and complex machines.

Conduct a hands-on demonstration showcasing a toy car, focusing on the wheel and axle. Allow students to touch and explore cars and think about how they would make their version of this. Ask questions like, “How does it work?” and “What do the wheels do?”

Action

Session 1:

- Let the students know they’ll be designing their own cars using the materials provided. They will also make their own ramps to launch those cars!
- Give students a chance to explore the provided materials, discussing their properties and potential uses.
- Place class into small work groups, break down the construction process into manageable steps making sure each student has a role in the construction. Discuss which materials will be which part of the car. For example, toilet paper tube is the body. The skewers are the axles. The bottle caps are the wheels.
- One student could oversee decorating while the other constructs the parts (wheels and axles) Emphasize safety while encouraging creativity in the design.
- Circulate the room to offer guidance, ensuring all students are actively participating and understanding the mechanics behind their creations.
- Allow for **30-45 minutes** for students to build their race cars.
- Have students share their designs with classmates, showing off the features of their rolling racers.

Session 2:

- Lead a discussion on incline planes, discussing how they can be found in everyday life (e.g., ramps, slides).
- Encourage students to brainstorm and sketch their incline plane designs before starting construction.
- Continue their teamwork by allowing students to work in their pairs or small groups to build their incline planes using cardboard or cereal boxes and other materials.
- Establish a rotation system for testing rolling racers on the different incline planes the students have built.
- Provide students with observation sheets to record their findings, such as which incline plane allowed their racer to travel the farthest.
- Encourage students to discuss their observations with classmates.

Consolidation/Extension

- Students can be encouraged to modify their race cars after testing them.
- Discuss real-world applications of simple machines and how they make tasks easier.

Additional Resources

Science for the Classroom: Simple Machines

<https://youtu.be/TKKjxdDHtdo?si=ev3r3a8vkNGmLPbe>

Machines simples mais astucieuses !

<https://youtu.be/duBZwhJPukY?si=YG44vkj9pO1YPtO0>