

**Building and Launching Water Rockets**

Mynd sem inniheldur teikning

Lýsing sjálfkrafa búin til

# Learning objectives

Shooting a coca cola bottle, transferred into a rocket, into the sky is conducted simultaneously with lessons on the universe and physics, students learn all about space, pressure and physics. As a practical activity, they make a water rocket. Video of the launcher will be available in resources. Water is necessary to make the rocket go higher.

**Objectives:**

• Understand basic principles of physics, including pressure and forces.

• Learn about space and rocket science.

• Apply creativity in designing and decorating rockets.

• Develop teamwork and collaboration skills

B&T dimensions and types covered

**Dimension:**

**1. Self-Confidence in Science and Technology.** Students build their **confidence** as they successfully create rocket and make it fly.

**6. Technology Can Be Learned.** The activity of taking a simple every day object and applying physics, step-by-step process, students learn about space pressure and physics.

**7. Practical Orientation.** This activity focuses on hands-on learning by changing everyday material into something els using physics.

**Type:**

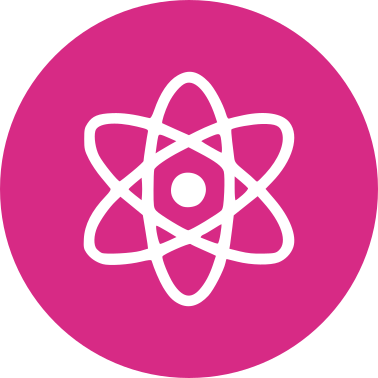
**Creative Makers:** This activity involves physically building and experimenting with objects, which resonates strongly with their preference for creating tangible objects.

**Doer:** Assembling the rocket, making it by hand

**Explorers:** Benefit from the guidance of building a rocket, helping them gain confidence while exploring elements of physics.

# Teacher Prerequisite Knowledge

The teacher(s) for this lesson need to be able to teach physics principles. Also, teach basic safety and construction with cardboard materials.



Grade Level

* Elementary school (grades K/1–2/3/4/5/6)- from 5 to 10 years old.
* Intermediate school (3/4–5/6) from 8 to 12 years old.
* Middle school / junior high school (grades 5/6/7–8/9) from 11 to 15 years old.
* High school / senior high school (grades 9/10–12) from 15 to 17/18 years old.

Subjects

* **Natural Sciences:** material properties.
* **Art:** Designing, decorating the rocket
* **Mathematics:** Measuring and mathematics

Materials

Preparation: Launching platform, pump

* Empty Coca-Cola bottles (one per group)
* Cardboard
* Scissors
* Tape and glue.
* Water
* Bicycle pump or air compressor.
* Launch pad (detailed instructions and videos available, teacher only needs one for the class)
* Paints, markers, and other decorating materials

**Safety rules & tips**

Don’t push the pressure above 8 bar bottles can explode!

While launching beware of the direction of the rocket flying to (buildings, cars, people) best to do on a sports field!

Duration

Two hours

Lesson Plan

Building and Launching Water Rockets the students in class 2 will build and launch water rockets within 2 hours. The rockets are made from Coca-Cola bottles and cardboard. Students work in groups of 2 or 3. Two rockets will be launched simultaneously each turn, allowing the students to compete against each other.

Introduction (20 minutes)

* + Welcome and Overview (5 minutes)
  + Brief introduction to the project and its objectives.
  + Explain the scientific principles behind the water rockets: pressure, force, and how rockets launch.

Step-by-step development

2. Lesson on Space and Physics (15 minutes)

* Discuss the basics of space and the universe.
* Introduce the concept of pressure and how it propels rockets.
* Use visual aids and videos to enhance understanding.

3. Group Formation and Material Distribution (10 minutes)

* Divide students into groups of 2 or 3.
* Distribute materials to each group.

4. Building the Water Rockets (30 minutes)

* Design and Planning (5 minutes): Each group sketches their rocket design and plans decoration.
* Cutting and Assembling (15 minutes):
* Cut cardboard fins and nose cones.
* Attach fins and nose cone to the Coca-Cola bottle using tape and glue.
* Allow students to decorate their rockets using paints, markers, and other materials (10 minutes)

**5.Preparing for Launch (10 minutes)**

* Demonstrate how to fill the bottle with water (about one-third full).
* Show how to attach the bottle to the launch pad.
* Ensure safety precautions are understood.

**6.** **Launch Procedures (40 minutes)**

* Launch two rockets simultaneously for each turn.
* Allow each group to have a turn.
* Measure and record the height and speed of each launch.
* Encourage students to cheer for their classmates and discuss the results.

Wrap- up & reflection

1. **Discussion, conclusion and Reflection (10 minutes)**
   * Discuss what happened during the launches.
   * Ask students what they learned about pressure, forces, and teamwork.
   * Reflect on what could be improved for future launches.
2. **Cleanup and Organizing (10 minutes)**
   * Ensure all materials are collected and the area is cleaned up.
   * Store reusable materials for future projects.

Extension activities

Related and supporting activities/modules

**Assessment:**

* Participation and teamwork during the activity.
* Creativity and effort in rocket design and decoration.
* Understanding of scientific principles as demonstrated during discussion and reflection.

**Extension Activities:**

* Research and present on different types of rockets used in space exploration.
* Write a short essay or draw a picture of their favourite part of the activity.

Additional Resources

Building plan for rocket

Building plan for launch pad.

Video of the rocket launching