

Making Earrings from   
Plastic Bottle Caps

Mynd sem inniheldur innandyra, flaska

Lýsing sjálfkrafa búin til með miðlungsáreiðanleika

Learning objectives

Students will learn how to create unique and eco-friendly earrings by melting plastic bottle caps, pressing them into sheets, and cutting out models using a laser cutter. They will also attach clips to the models to make wearable earrings. In this exercise the aim is to have a fun first interaction with designing a small object and learning about making a vector file and cut out.

Learning objectives: Designing your own ideas and cutting out with a laser cuter, recycling, upcycling, designing, environment tech; heating, laser cutting, melting plastics.

B&T dimensions and types covered

* **Dimensions**:
  + **Dimension 2: Confidence in technopolitical progress:** By combining technical and art elements the students can build up confidence through small success, and then apply their skills to construct bigger items.
  + **Dimension 3: Interest in new technology:** Students explore and engage with both technical and hands on activities depending on their creative proses.
  + **Dimension 4 – Appreciation and Respect**: Understanding and respecting for natural elements like clay being combined with technological knowledge.
* **Types**:
  + **Creative makers:** Engage with the designing in a technical manner.
  + **Explorers:** This activity provides a safe, guided space to experiment and learn by trial and error. Testing materials for conductivity and discovering how 3D modeling and 3D clay printing works.

# Teacher Prerequisite Knowledge

The teacher(s) for this lesson must know how to teach students to use a 2D design software like Inkscape or Illustrator. They should also know how to operate a laser and teach laser safety.

|  |  |
| --- | --- |
|  |  |

Grade Level

Middle school / junior high school (grades 5/6/7–8/9) from 11 to 15 years old Group of ca. 6 students.

High School / College Level / Girls, Women 16 -30 Art, Design, Human tech. Group of ca.10 students.

Subjects

**Natural Sciences:** material properties.

**Technology:** Working with vector files and using a laser cuter

**Art:** Designing a form

**Mathematics:** Measuring and classifying materials based on conductivity.

Materials

**Materials Needed:**

* Plastic bottle caps (variety of colours)
* Small oven
* Metal press, heat press or other device to melt the caps and form
* Laser cutting machine
* Clips for earrings
* Protective gloves
* Safety goggles
* Heat-resistant mats
* Baking sheets
* Parchment paper
* Sandpaper
* Design templates (for laser cutting)
* Rulers and markers
* Tweezers

**Safety Precautions & tips:**

* Always wear protective gloves and safety goggles when handling hot materials and equipment.
* Ensure proper ventilation in the workspace.
* Supervise the use of the oven and laser cutter at all times.
* The plastic heats up when being laser cut, it is hot and must be taken from the laser cutting area directly after laser cutting, otherwise it might melt back together.

Preparation

Collect plastic caps, preheat them in oven or press, laser cutting machine.

Duration

**Duration:** 3 hours

Lesson Plan

In a room with space to design and cut the earrings start with an introduction

Introduction (15 minutes)

* Welcome students and explain the objective of the lesson.
* Discuss the importance of recycling and how it can be applied in creating jewellery.
* Show examples of earrings made from recycled plastic.

step-by-step development

**Preparing the Plastic (30 minutes)**

* Have students collect plastic bottle caps and sort them by colour.
* Preheat the oven to 175°C (350°F ).
* Place the bottle caps on a baking sheet lined with parchment paper.
* Put the baking sheet in the oven and bake until the plastic is melted (approximately 5-10 minutes).
* Carefully remove the baking sheet from the oven and let the melted plastic cool slightly.

**Pressing into Sheets (20 minutes)**

* Once the melted plastic is cool enough to handle but still pliable, place it between two sheets of parchment paper.
* Use the metal press or heat press to flatten the plastic into a thin sheet. Ensure even pressure for a uniform thickness.
* Allow the plastic sheet to cool completely.

**Alternative using heat press or heat gun to heat up the plastic and press.**

* Option 1: Heat a cap with a heat gun and then press with steel spatula other firm objects between baking paper.
* Option 2: use baking paper place it in a heat press and place a plastic cap on the press. Press together open and press with spatula or another firm object.

**Designing and Cutting (40 minutes)**

* Provide students with design templates for their earrings or allow them to create their own designs.
* Transfer the designs onto the cooled plastic sheets using a marker.
* Use the laser cutting machine to cut out the designs from the plastic sheet.
* Demonstrate the proper and safe use of the laser cutting machine.

**Finishing Touches (30 minutes)**

* Smooth the edges of the cut-out designs with sandpaper to avoid sharp edges.
* Attach clips to the plastic models using tweezers.
* Ensure the clips are securely attached and the earrings are ready to wear.

**Review and Showcase (15 minutes)**

* Have students share their finished earrings with the group.
* Discuss the process and any challenges faced.
* Encourage students to think of other ways to recycle materials creatively.

wrap- up & reflection

**Cleanup (10 minutes)**

* Ensure all materials and tools are properly cleaned and stored.
* Make sure the workspace is tidy.

**Conclusion (10 minutes)**

* Recap the lesson and highlight the importance of recycling and creativity.
* Encourage students to continue exploring eco-friendly crafts.

Extension activities

The exercise can be repeated with a greater emphasise on design elements. Using nature for example as an inspiration of form and cutting out in plexi or wood, see additional resources for inspiration.

Additional Resources

Studyoni on Instagram

<https://hinttadesign.fi/>

See LP website.

**Additional Notes:**

* Adjust the duration of each segment based on the class’s pace and engagement.
* Consider having additional helpers or instructors to assist with the use of the oven and laser cutter for safety.