

- Lower Secondary Education ✓
- Upper Secondary Education

Age range:

11-15

Teacher guide:

This task is about designing and producing an artifact. The students can choose between designing a vacuum cleaner, a toy car or a hair dryer.

For the teacher, this task can be used to reflect upon gender issues in STEM.

Objective → To highlight the nature of a task by considering its strengths and weaknesses in relation to gender balance

Theme → How to meet, motivate & inspire both girls and boys in STEM careers

Impact → This is an activity to inform teachers be aware of possible preferences of boys and girls while making decisions for classroom tasks

For the students, some of the objectives of the task are:

- To learn about electric circuits and the direction of current;
- To learn how to use batteries, small motors and (design) fans;
- To learn about the different parts of an own vacuum cleaner, hair dryer or toy car.
- To experience the importance of group work in arriving at creative solutions to a challenging problem

Working method for designing the artifact

Group work → Groups of 4-5 students.

- brainstorming, the inquiry, planning and design and drawing on a sheet (30 minutes),
- the building of a chosen artifact (60 minutes),
- presenting present their design/actual artifact to their classmates (30 minutes)

World of Work Dimensions**Context**

The task has a direct connection to the world of work. Students explore the nature of some basic products such as vacuum cleaner or hair dryer. They generate creative solutions to a challenging problem and works like engineers.

Role

Students work in groups as designers and engineers to produce an artifact



Activity

Students both design and build their own vacuum cleaner, hair dryer, or toy car. Students are given opportunity to choose one task among three based on their interest.

Product

Vacuum cleaner or hair dryer or toy car are the actual products.

Related profession:

Becoming a(n)...

electrical engineer, designer

Materials needed

- Pencil and paper for each participant

Actual materials that are necessary to carry out the activity can also be provided to participants and they can carry out these tasks:

- Small motors 1,5-3V,
- Batteries 4,5V or 3x1,5 V,
- 3 x AA Battery Box,
- Solid Core Wire,
- Solid Core Wire resistance,
- Plastic bottles from 0,5l-2l and plastic bottle lids,
- Paper fasteners,
- Paper clips,
- Wire strippers,
- Pieces of card board 10x10 cm,
- Debris from a hole puncher,
- Glue pistol,
- CDs,
- thin wood sticks or Lollipop sticks

More information

If you want to know more about gender issues in STEM and how vacuum cleaners or hair dryer work you can look at these websites:

<http://home.howstuffworks.com/vacuum-cleaner.htm>

<http://home.howstuffworks.com/hair-dryer.htm>

<http://www.engineer-project.eu/download/design-your-own-small-vacuum-cleaner/index.html>

<http://j-stem.net>

<http://stingeuproject.com>



