

# Engineering Energy

Energy is the ability to do work. It is also known as power and is happening all around us. It comes in many forms and in this activity, you will explore a specific type of energy, wind energy.

## Time Required



30-40 minutes

## Goals and Outcomes

- Understand the Engineering Design Process.
- Leadership Outcomes
  - Innovate to create positive impact.
  - Make choices rooted in her values.
  - Challenge herself to understand and take into account different perspectives.

## What You'll Need

- Paper
- Rubber bands
- Straws
- Scissors
- Hole punch
- Lego
- Paper cup
- String
- Fan or wind of some kind
- Any additional materials available to use.

## Before the Activity

- Organise the materials so they are ready for participants to use.
- Participants can start by reflecting on the following questions:
  - What are some types of energy that you know of? Are these types of energy renewable?
  - Where do you see this energy in your life?
  - Why might we be interested in using renewable energy in our lives?

# Engineering Energy

## What To Do

- Participants will be instructed that they are engineers exploring a new renewable energy method: wind energy. They are responsible for designing a working wind turbine.
- Before they start building, on a piece of paper create a design of a wind turbine. If available, they can do some research online about the design of turbines.
  - How does this turbine look like?
  - What size should the blades be?
  - How should everything be connected?
- Once participants have a design, using the resources provided, design they will build a working wind turbine
- Once the wind turbine is built test it out. A fan can be used to test the
- Repeat steps 2-4 two times and keep changing and improving the previous design.
- When participants have created and tested two or three designs, discuss the following:
  - What did you notice about the size of the wind turbines blades? How would changing the size affect the wind turbine?
  - Is there anything you would change about your design if you were able to do the challenge again? Explain.
  - How important do you think the position of your wind turbine was?
  - Did some of the wind turbines work better than others?

## After the Activity

- If time remains, allow participants to continue to use different materials and create a design that is completely different from their previous design.
- Reinforce that engineering is a lot of trial and error and that using engineering you can create innovative solutions which can solve some of the greatest problems in the world.
- Participants can reflect on the following questions:
  - How can this engineering design process be used in your day-to-day life?
  - Why is it important to always improve the work that you do and iterate over your designs or solutions to different situations?
  - What problems could you solve using the engineering design process? What problems are you interested in solving (if any) in the real world?

# Engineering Energy

## Tips and Tricks

- For older groups, it is possible to make this into a challenge and have them design based on different specifications (e.g. has to go a certain speed or lift a certain weight).
- Definition of Renewable Energy: Renewable energy is a type of energy that comes from natural resources and has an endless supply due to human nature.