

Parent/Guardians Information Sheet

Dear Parents/Guardians,

Thank you for supporting our workshop! We are so glad your child actively participated and enjoyed the activities. This information sheet provides a summary of the workshop and instructions for further exploration. If you would like, you can continue STEM learning at home with your child.

In **Workshop 4**, we built a **wind turbine** while exploring the principles of **electromagnetism** and **renewable energy**. We learned how electricity and magnetism are connected, how wind energy can be converted into electrical energy, and how the design of turbine blades affects energy generation. Working in small groups, students conducted experiments to **test how different numbers and shapes of propeller blades impact wind power generation**.

We encourage you to support your child if they'd like to explore further and experiment with different blade designs or other renewable energy projects at home. Thank you for being part of this exciting journey! If you have any questions/suggestions/feedback, please feel free to contact us through email/WhatsApp/Instagram or **give comment on our website blogs**.

Kind regards,

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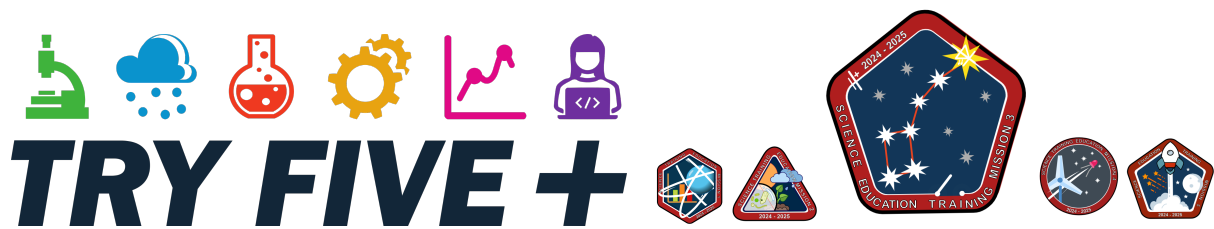


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Department of Education

Taighde Éireann
Research Ireland

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WIND TURBINE

1. How it works

A wind turbine turns wind energy into electricity using the power of spinning blades and electromagnetism:

1) **Wind Turns the Blades:**

When the wind blows, it pushes against the turbine blades, causing them to spin. The shape and design of the blades help them capture as much wind energy as possible.

2) **Spinning the Shaft:**

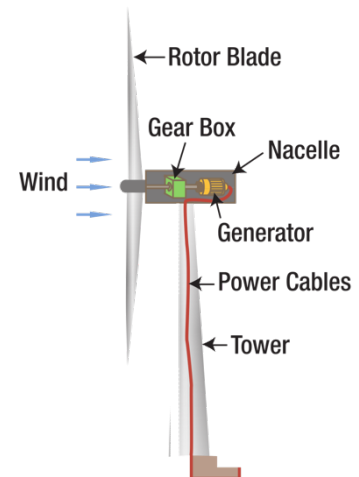
The blades are connected to a shaft inside the turbine. When the blades spin, the shaft spins too.

3) **Generating Electricity:**

The spinning shaft is connected to a **motor (or generator)**. Inside the motor, the movement of the shaft causes magnets to rotate near coils of wire. This creates an **electric current** through a process called **electromagnetic induction**.

4) **Powering Devices:**

The electricity generated can be used to power devices or stored for later use.



2. Do Experiment at Home

What other factors can influence its efficiency? Here is something you can test at home:

1) **Wind Scale & Number of Blades:**

- Fewer blades (e.g., 2 or 3) often spin faster and are more efficient in strong winds.
- More blades (e.g., 4 or 5) can capture more wind energy in lighter winds but may spin slower.

2) **Shape of Blades:**

- Curved or aerodynamically shaped blades (like airplane wings) are better at capturing wind energy.
- Flat blades are simpler but less efficient.

3) **Angle of the Blades (Pitch):**

- Blades tilted at an optimal angle can catch more wind and spin more effectively.
- If the angle is too steep or too flat, the blades may not spin as well.

4) **Size of Blades:**

- Longer blades can capture more wind energy but may require stronger materials to avoid breaking.
- Shorter blades are sturdier but may generate less energy.