
SCIENCE
TRAINING
EDUCATION
MISSION 1
2024 - 2025


DUBLIN
TRY FIVE +
workday.
An Roinn Oideachais
Department of Education
Taighde Éireann
Research Ireland


SCIENCE
EDUCATION
TRAINING
MISSION 5
2024 - 2025


SCIENCE
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MISSION 2
2024 - 2025


2024 - 2025
SCIENCE
EDUCATION
TRAINING
MISSION 3


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2024 - 2025

MISSION 4

THE SUSTAINABLE SPACE EXPLORER

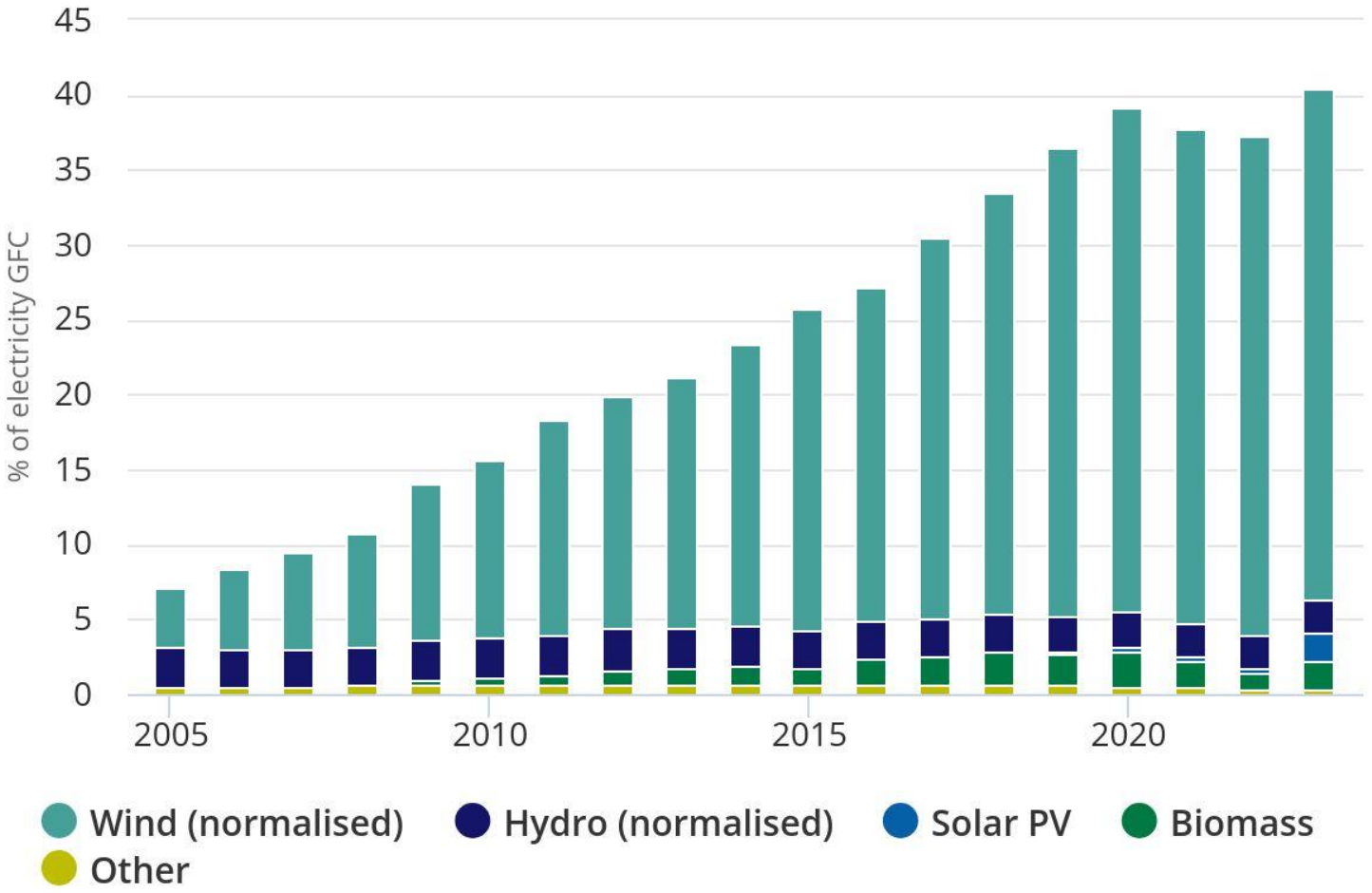
Activities

- Scissors
- Skewers/toothpicks
- Batteries

RENEWABLE ENERGY?

- ✓Not harmful to the environment
- ✓Not using more resources than the planet can provide for us
- ✓Provide fresh air, food, clean water and good quality of life
- ✓Avoid damage now - future generations

Renewable energy share in electricity (RES-E)



HARNESSING ENERGY FROM THE WIND


T+05:41
SN10

MISSION CONTROL

THE CREW HAS ARRIVED SAFELY IN MARS

THE FIRE HAS DESTROYED THE SOLAR PANELS AND SOME BATTERIES

THE CREW NEEDS YOUR HELP TO DESIGN A WIND TURBINE TO MAINTAIN LIFE SUPPORT UNTIL RESUPLY.

SPACE CADETS, Your help is needed

Time is limited!

Support from a Senior Scientist to explain about wind generation

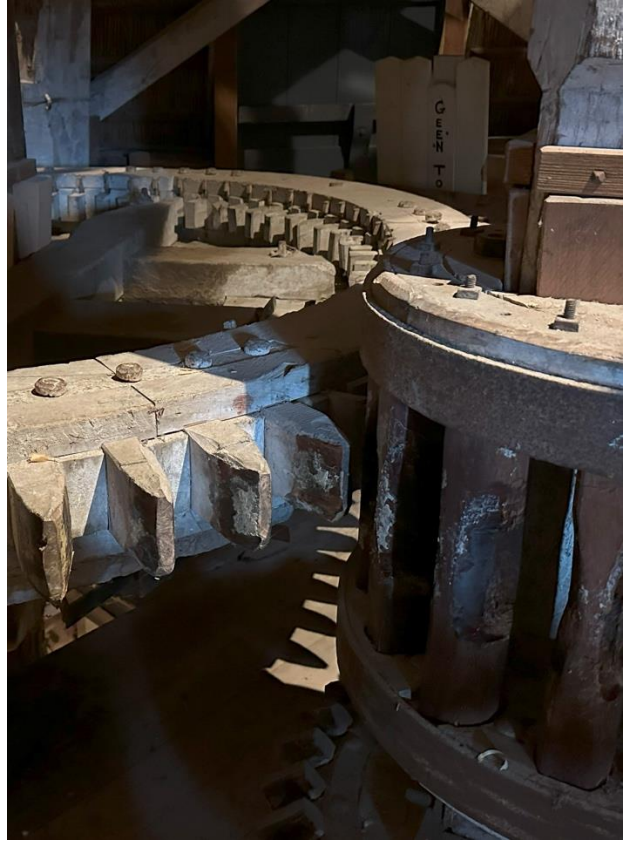
Work in groups/pairs to research wind propellers.

Design your own propeller and present your results.

	Earth	Mars
Air Thickness	Thick air = strong wind = lots of power!	Thin air = weak wind = less power (but still possible!)
Wind Speed	Medium wind = perfect for turbines	Fast wind during dust storms = turbines can spin, but air is too thin for big power.
Dust Storm	Rare and small = no problem	more wind but dust can clog turbines
Energy from Wind	Lots of power for homes and cities	Less power, but enough for small bases or robots (great backup for solar panels!)

Can we use wind energy in Mars?



WHAT HAPPENS INSIDE?

- WINDMILL & WIND TURBINE

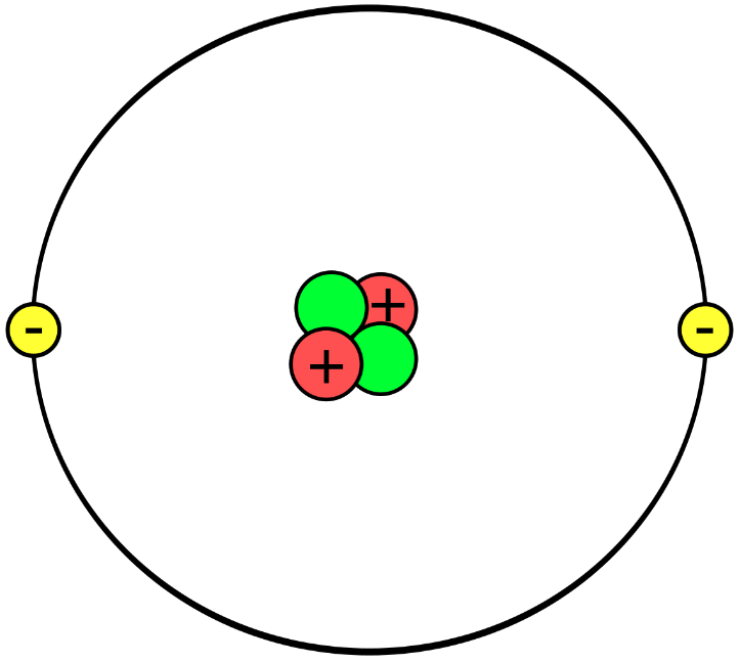
One of the last wind-driven mills: chalkmill the Admiral

How does a Dutch chalk mill work ? Krijtmolen d' Admiraal

WIND ENERGY – MECHANICAL ENERGY – ELECTRICAL ENERGY

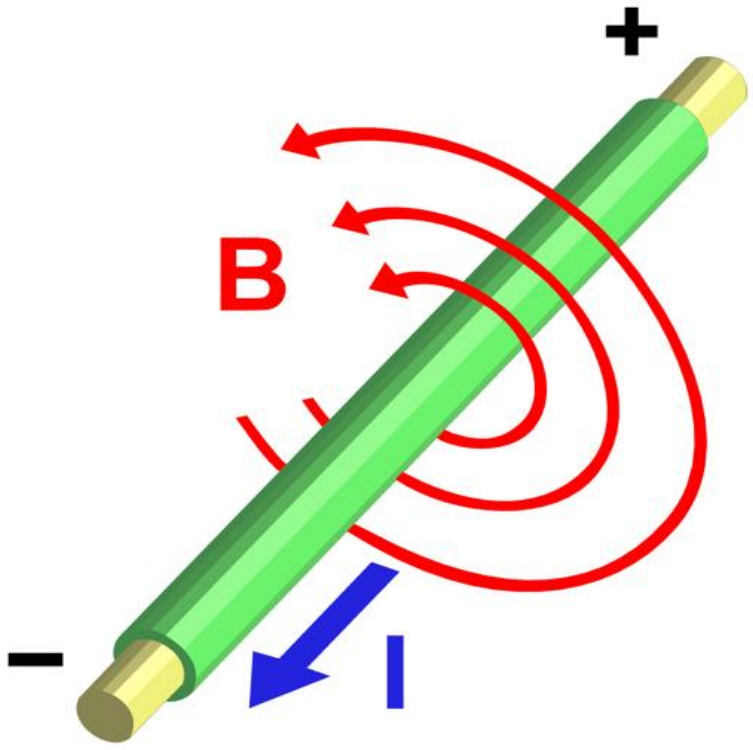
(WINDMILL) **(WIND TURBINE)**

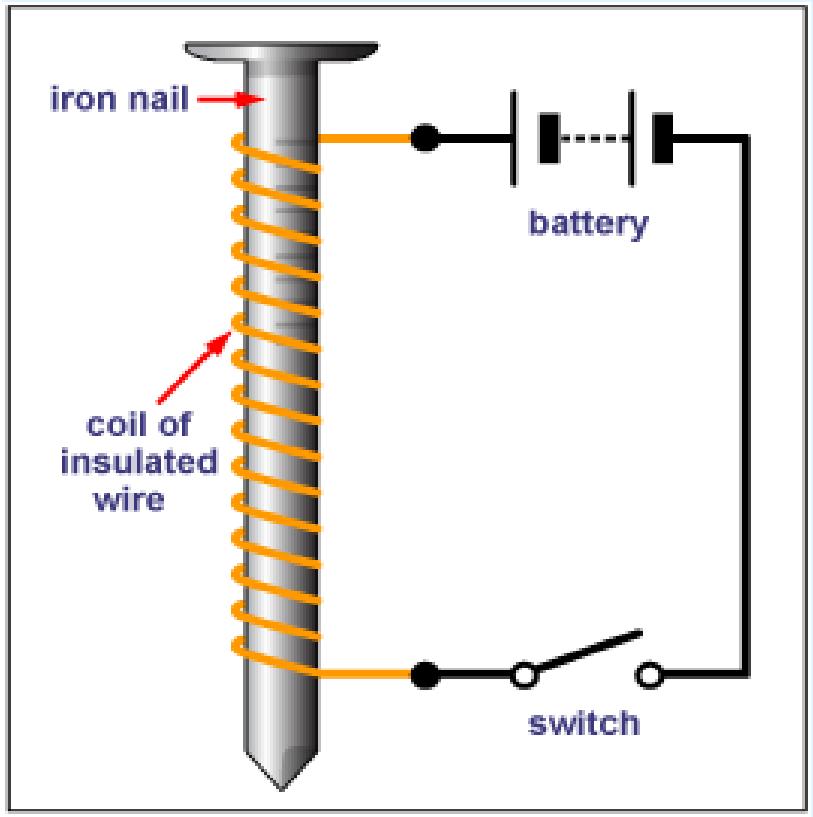
WHAT IS ELECTRIC ENERGY?



- Electricity is produced by the flow of electric charge.
- It can also mean the energy you get when electrons flow from place to place.
- This is useful because electricity that is generated can be controlled and sent through wires. It can then power such things as heaters, light bulbs, and computers.

ELECTROMAGNETISM





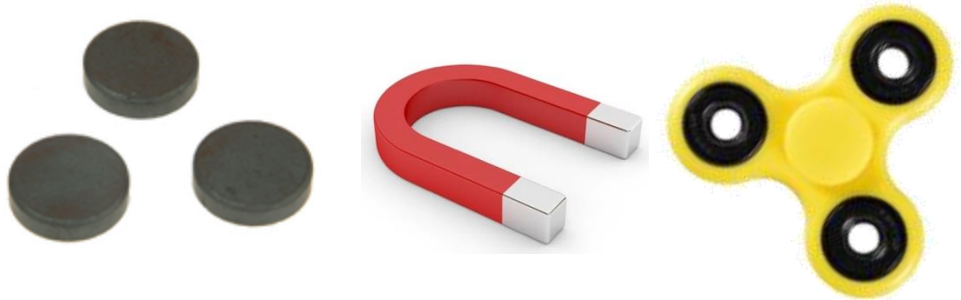
MAGNETIC FIELDS

The magnetic field created by the current travelling through the wire, will affect the compass.

USING MAGNETISM TO GENERATE ENERGY

IT WORKS BOTH WAYS

DC MOTORS



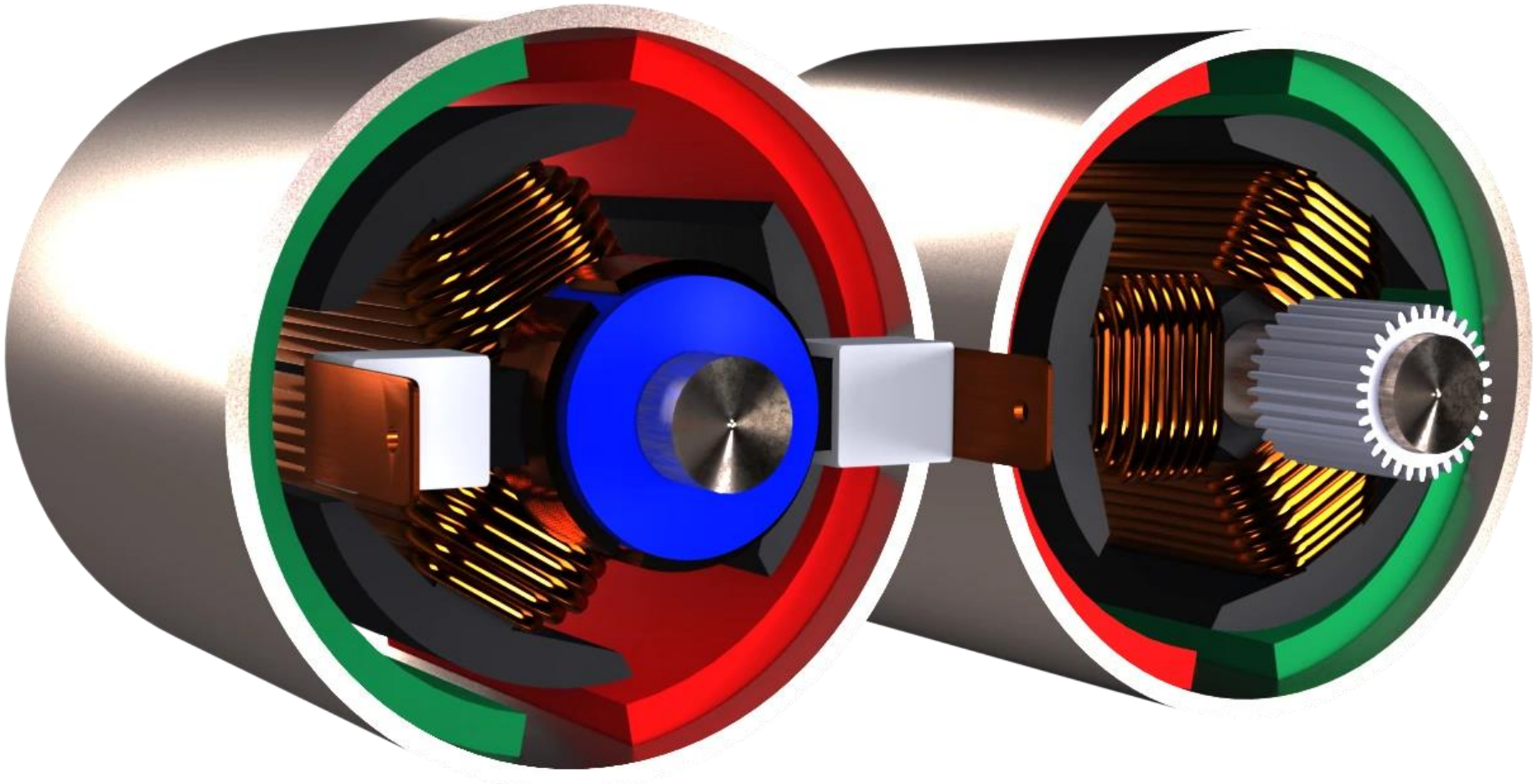
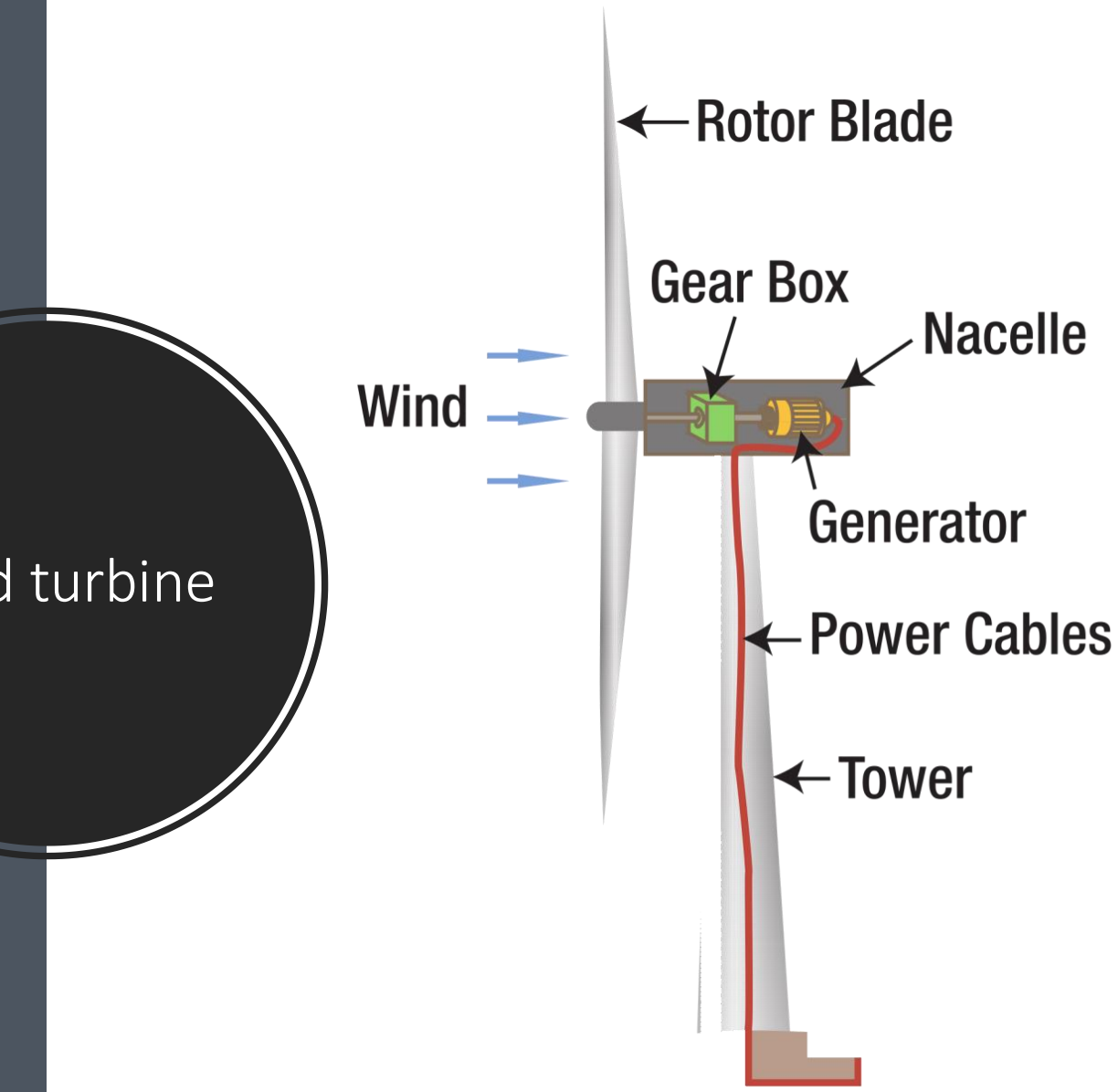
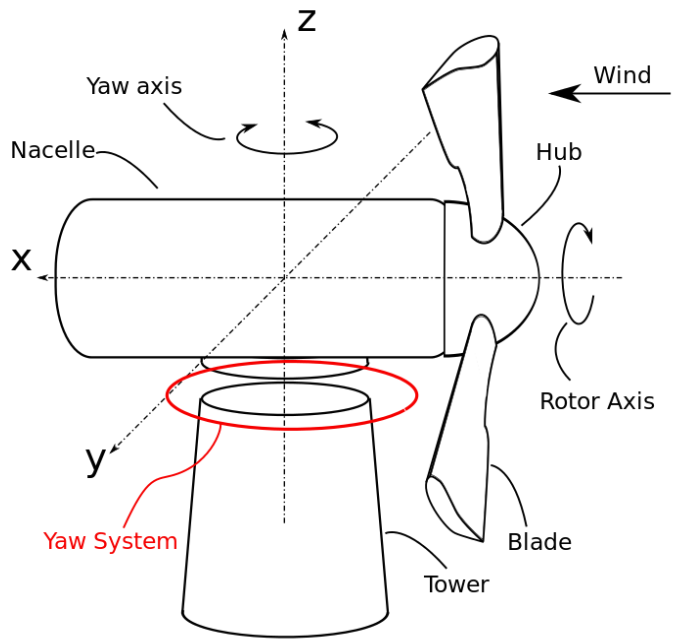


Image by OSMOS - https://oswos.com/dc-motors/

Wind turbine





SPACE CADETS, Your help is needed

Time is limited!

Not a lot of margin for error! Limited supplies and materials.

Work in groups/pairs to research wind propellers.

Design your own propeller and present your results.

PROTOTYPE

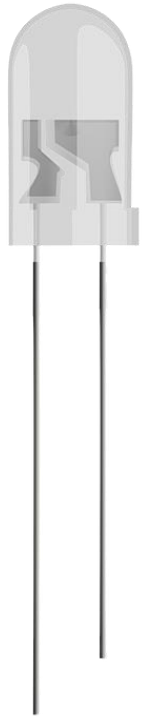
- Wood support/Foam
- Tape
- Motor
- Cables and spring clips
- Multimeter
- Paper
- Toothpicks
- Cork/EVA core

HOW DO WE TEST?

- Wind Generator

Remember your training!

Generating electricity



Can you light the LED with your hands?

RESEARCH

- Wood support
- Tape
- Motor
- Cables and spring clips
- Multimeter

HOW DO WE TEST?

- Wind Generator

RESEARCH!

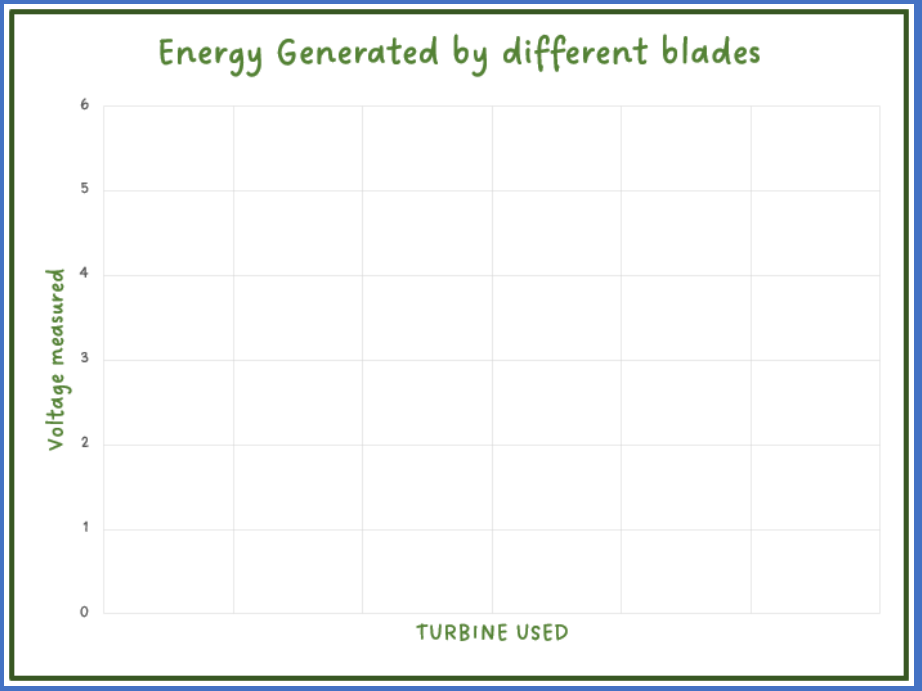
PROPELLER DRAWING	WHAT IS DIFFERENT ABOUT THIS DESIGN/ WHAT CHANGES DID YOU MAKE?	VOLTAGE GENERATED	OBSERVATIONS
	This is my first try.		

Blades

- The angle of the blades
- The shapes of the blades
- The size of the blades
- The number of the blades
- The thickness of the blades
- … …

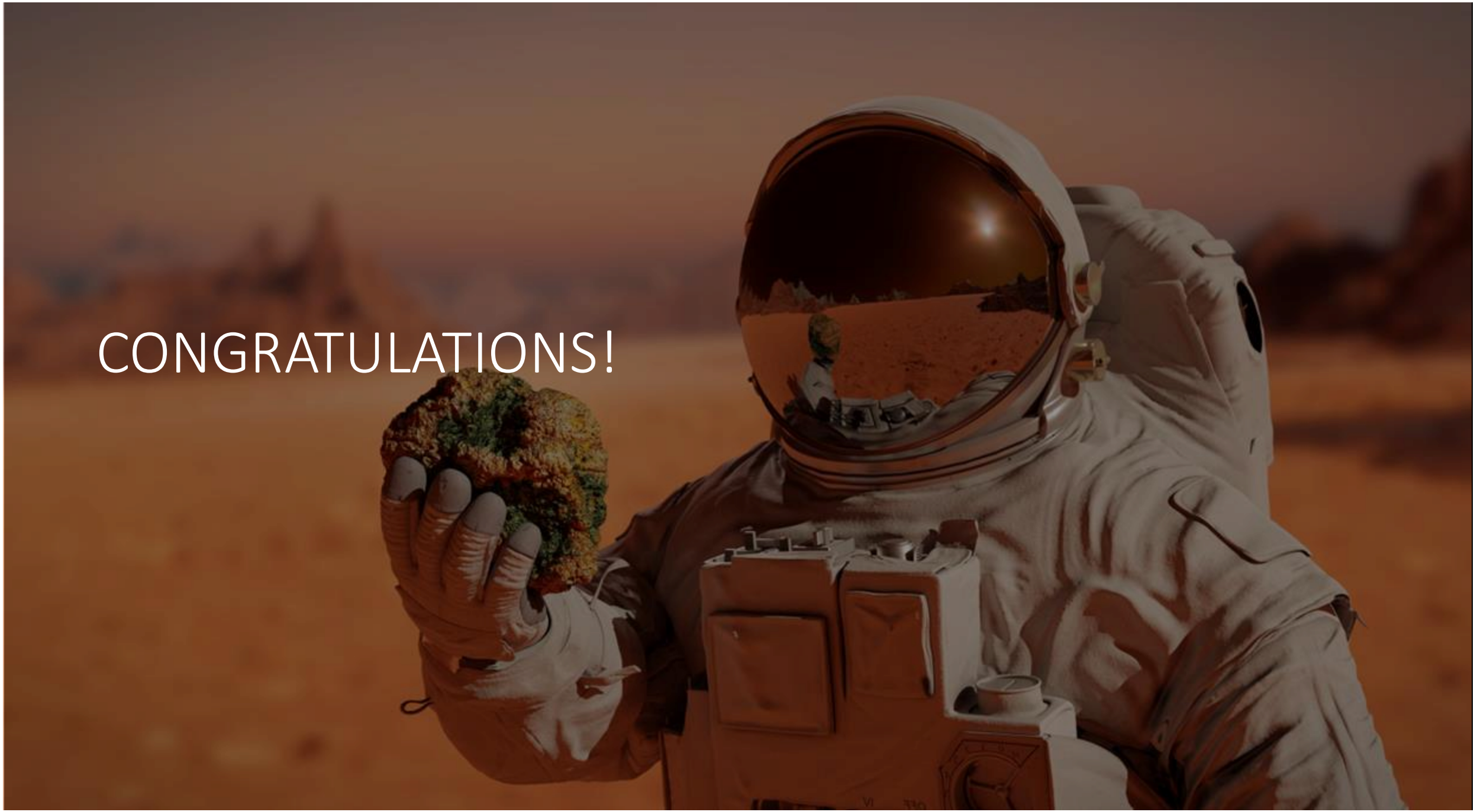
Foam

- Use more tapes to make it more stable
- Make it more in the centre
- … …



PROPELLER CODE	NUMBER OF BLADES	DIAMETER	VOLTAGE GENERATED	OBSERVATIONS


PRESENT YOUR RESULTS!


CONGRATULATIONS!