curious minds
Discover STEM

SCIENCE WEEK #scienceweek
Supported by Research Ireland

Back-To-School Pack

Celebrate Science Week's 30th birthday this year!

Be creative and make your own windmill with this resource.

Celebrate what you love about science and reflect on the Science Week theme:
Then. Today. Tomorrow.

Send a photo or video of your class with their windmills to curiousminds@researchireland.ie to be part of the Curious Minds Science Week Show on 10 November.

Taighde Éireann
Research Ireland

Curious Minds: supporting STEM education in your school

September 2025

Dear Principal,

Taighde Éireann – Research Ireland is delighted to welcome your school back for another academic year. Our Curious Minds programme is ready for another year of inspiring learning in science, technology, engineering and maths (STEM). Our programme supports schools to nurture curiosity in young people, and develop their critical thinking skills through a hands-on, inquiry-based approach to STEM learning. Please find enclosed a digital copy of our 2025/2026 Wall Planner, which highlights key STEM events and dates throughout the year. If would like a hard copy for your classroom, staffroom or school noticeboard, you can request one at www.curiousminds.ie.

We hope your school will participate in elements of our programme, such as the Curious Minds Awards, CPD workshops, the Discover Centre Network, our fantastic STEM-themed classroom resources and national STEM weeks. This year, we have included our Science Week-themed resource in our pack, and encourage you to take part in our Science Week Show by submitting a video of your learners with their windmills to curiousminds@researchireland.ie!

Taighde Éireann – Research Ireland is also home to ESERO Ireland, the European Space Education Resource Office, which uses space as a theme to inspire and engage young people in STEM. There are a whole host of activities on the ESERO Ireland website.

Register now for Free Teacher Continuous Professional Development

Our free three-part course of CPD workshops, run in partnership with ESERO Ireland, shows primary school teachers how they can apply inquiry-based learning across a range of STEM subjects in a captivating, fun, hands-on way.

Curious Minds Awards

Every year, we're amazed by the innovative ways Irish educators are teaching STEM subjects. Our Curious Minds Awards are the perfect way to celebrate schools going above and beyond with their STEM lessons. For registration details, visit the awards page on our website.

Discover Centre Network

Taighde Éireann – Research Ireland's STEM-related Discover Centres offer accredited workshops for primary schools. The centres engage learners in science outside of the classroom in a curriculum-relevant, hands-on way. From national parks to zoos, there is a wide range of choices for all interests. For details, see our website.

Curious Minds Support and Information

Visit www.curiousminds.ie to explore our full range of support and classroom resources. You can keep up to date with our Curious Minds newsletter or follow @ResearchIreland on Instagram and TikTok. Please remember that you can always contact our team at curiousminds@researchireland.ie with any queries. We look forward to working with you in 2025/2026 and beyond. Yours sincerely,

Abigail Ruth Freeman

Dr Abigail Ruth Freeman
Director of Science for Society, Taighde Éireann – Research Ireland

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Classroom Resource

Investigating Wind Energy Using Simple Windmills

Taighde Éireann
Research Ireland

Investigation

Investigating Wind Energy Using Simple Windmills

Class Level – All

Curriculum Links

Strand:	Energy and Forces; Environmental Awareness and Care
Strand Unit:	Forces; Environmental Awareness: Science and the Environment
Curriculum Objectives:	Investigate how forces act on objects; become aware of and explore how moving water and moving air can make things move; become aware of the importance of the Earth's renewable and non-renewable resources; come to appreciate the need to conserve resources; identify some ways in which science and technology contributes positively to society
Skills Development:	Questioning; observing; predicting; investigating and experimenting; analysing recording and communicating
New words/ vocabulary:	Beaufort scale, kinetic energy, atmosphere, anemometer
Focail nua:	Scála Beaufort, fuinneamh cinéiteach, atmaisféar, ainéimiméadar
Cross curricular links:	• Maths: lines, angles, triangles, measures, data, averages, tables and graphs • Geography: Weather, Climate and Atmosphere • History • Art
Equipment/ materials	• Assorted types of paper • A pencil or wooden stick to form part of each windmill • A drawing pin for each windmill • A small bead for each windmill • Pencils and Rulers for drawing • Scissors • Coloured pencils, crayons or markers for decorating

Engage

Prompt questions

- Where does the wind come from?
- Could we make something to harness the energy of the wind?
- What was wind energy used for in the past?
- What is wind energy used for today?
- How is wind speed measured?
- How could we use our windmill to measure the speed of the wind?
- How could we create a square from a rectangular piece of paper? How many ways can you think of to do this?

Background information

Wind is the movement of air near the surface of the Earth caused by changes in temperature. Heat energy from the sun warms parts of the Earth's surface. This in turn warms the air and causes it to rise. Cold air then moves in to replace the warm air, forming wind. Wind affects the weather in lots of ways. Winds can bring cold air to warm places or can bring rain or snow. Some winds are very gentle while others are very strong. For the purposes of weather forecasting, wind speeds are measured using a device called an anemometer. The energy of movement is known as kinetic energy. The kinetic energy of the wind provides the force that pushes the blades of a windmill to make it work.

Real World Application

In 1806, a naval officer from County Meath called Sir Francis Beaufort came up with a way to classify wind speeds and estimate them at sea based on the appearance of the waves, or on land by the movement of trees and other objects. The Beaufort Scale goes from 0 (Calm) to 12 (Hurricane).

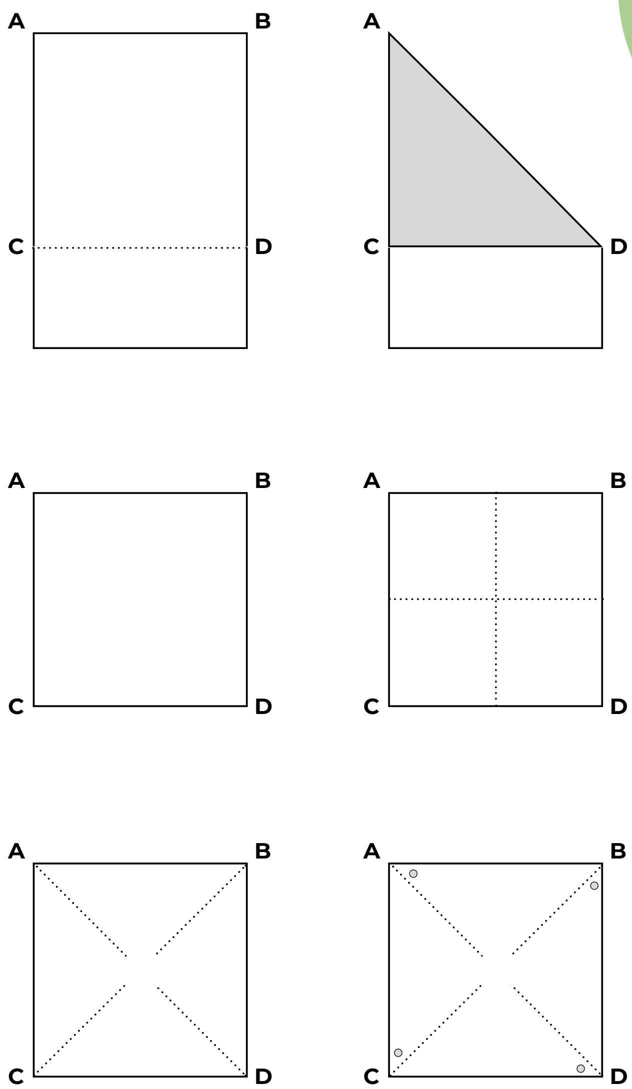
In the past, the power of the wind was used to power windmills for grinding wheat into flour or pumping water. Now, we can harness the energy of the wind in a wind turbine which turns the kinetic energy of the wind into electrical energy to power our homes, schools and businesses. We are increasing the amount of wind energy we use in Ireland every year as wind is a renewable energy resource that helps reduce our reliance on fossils fuels.

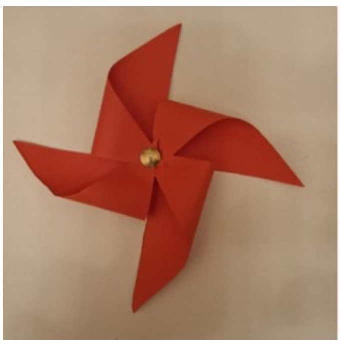
Exploring

To build a simple windmill:

Take a small square sheet of paper (you can use the method shown below to cut 4 small square sheets from a rectangular A4 page.

1. Bring corner B across to meet corner C
2. Fold along line AD to form a right-angled isosceles triangle
3. Cut along line CD to leave a large square
4. The larger square can be folded as shown and cut into 4 small squares
5. Using one of the smaller squares, draw 2 diagonal lines across the small square leaving a space in the middle as shown, and cut along these lines
6. Take each of the 4 corners shown by grey dots and fold them into the centre of the square making sure to overlap them
7. Push a drawing pin through the centre of the paper making sure that all 4 windmill blades are secured as seen below (this is tricky and might need to be redone a few times before all blades are secure).
8. The drawing pin should be pushed into the top end of a pencil or wooden stick (not into the eraser but the wood below it)
9. It can be difficult to get the windmill to spin if the paper rubs against the pencil. To overcome friction and allow the blades to spin freely, something like a small bead can be placed between the paper and the pencil as shown below. It will need to be small enough to allow the drawing pin to still stick into the pencil.





Test the windmill to see if it spins and adjust as necessary.

Investigate

Once the learners have tested their windmills and have managed to get them to spin, encourage them to design a fair test investigation using their windmills.

Prompt question

For a younger class, the teacher might assign a question to investigate, or the class might agree on one question following a class discussion. Older classes should be encouraged to work in groups to come up with their own question. Examples might include but are not limited to:

- Which type of paper makes the windmill spin fastest? (try different types of thicker or thinner paper)
- Does the windmill spin faster closer to the ground or higher above the ground? (holding it while sitting on the ground or while standing up)
- Which part of the school has the fastest wind speed?
- Does the size of the windmill affect how well it spins?

Predicting

Based on their chosen question, the learners should make a prediction on the outcome and give a reason for their prediction.

Conducting The Investigation

For each question they investigate, the learners should think about how they will make it a fair test i.e. changing only one variable at a time and keeping everything else constant. For example, if they are changing the type of paper, they should make a few windmills the same size and test them all in the same place and the same way.

Most questions will involve measuring the speed at which the windmill is spinning. This can be calculated as rotations per minute. Ask the learners to figure out how to test this and come up with their own solutions. They might need to consider things such:

- Colouring one blade a different colour to make it easier to count how many times it rotates in one minute.
- If the windmill is spinning too fast to count the rotations, they might video it and play it in slow motion.

Sharing data/results

Groups should decide how they will record their results and present them to the class. Will they draw a table of results, draw a graph, video the results?

Especially for older classes, the windmills can be used for a variety of practical maths activities to include:

- Identifying a right-angled isosceles triangle when folding paper to get a square. Measuring lines and angles.
- Counting or calculating the number of rotations per minute.
- Calculating averages by repeating each investigation a number of times.
- Ratios: Using different sized squares to make their windmills, they might work out the ratio of the width of the initial sheet to the diameter of the finished windmill.
- Data collection: for each different starter question, data can be gathered, and learners can choose how to represent it in graphs or tables. Can they come to any conclusions based on their data?
- For 5th and 6th class, they might fit their finished windmill into a circle to calculate the distances travelled in each rotation. The diameter of the circle will be equal to the distance from one blade tip to the opposite one and if they use this to calculate the circumference, this will be the distance travelled in each rotation. If they know the distance travelled and the number of rotations per minute, they could potentially work out the speed in metres per second.

Take the Next Step

Adapt for home:

This is a very simple investigation that can easily be replicated at home without any adaptation.

Adapt for Junior/Senior level:

Junior classes might make the windmills and carry out a simple investigation. For older classes, the level of maths and science can progress.

Follow-up challenge/project/citizen science link:

Investigating wind and weather

- Using the Class Weather Station resource from esero.ie, make an anemometer and other weather instruments to record the weather and compare to Met Eireann data
- Using the classroom resources and energy statistics from The Sustainable Energy Authority of Ireland at seai.ie, find out more about Ireland's use of wind energy
- Use technology to make a video of your windmill's rotation to help with calculating speeds

History

- Research Sir Francis Beaufort and the Beaufort Scale
- Find out about how windmills were used to grind flour in the past.

Art

- Get creative with the design of your windmill! If you decorate the page before making the windmill, how will the design appear once it is finished?

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Planner 2025-2026

Curious Minds Celebrating STEM Every Day

The Curious Minds programme supplies the tools to empower primary schools in teaching science, technology, engineering and maths, allowing teachers to spark fun and curiosity both inside and outside the classroom.

Curious Minds invites you to:

- Download a range of engaging STEM education resources.
- Register your school for a free STEM education Continuous Professional Development (CPD) course in partnership with ESERO Ireland.
- Visit a Discover Centre for a captivating informal STEM learning experience.
- Celebrate your school's STEM achievements by applying for a Curious Minds Award.
- Join us for our exciting online Science Week show and activities.

Learn more at: **www.curiousminds.ie**

ESERO Ireland

The Curious Minds programme is run in partnership with ESERO Ireland which uses space to inspire and engage young people in science and technology found in the world around them. Access Space themed resources, activities, games, images, videos and projects for your classroom at **www.esero.ie**

Curious Minds Awards Teacher Briefing Dates

Wednesday November 26th @ 3:30pm
Platinum Awards Applicants

Wednesday January 21st @ 3:30pm
Gold/Silver Applicants

Wednesday March 25th @ 3:30pm
Gold/Silver Applicants

Platinum Awards Dates

Platinum Award Sign-Up Deadline:
Friday 17 October 2025

Submission of pre-Platinum application form:
Friday 24 October 2025

Submission of full Platinum Award application:
Friday 1 May 2026

Dates to Remember

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SEPTEMBER

September 1: Curious Minds Awards Registration Opens **www.curiousminds.ie**

September 1: Registration is open for Curious Minds CPD **www.curiousminds.ie**

September 1: ReelLIFE SCIENCE Science Video Competition begins **www.reellifescience.com**

September 8: ESA Astro Pi – Mission Zero Coding Challenge launch **www.esero.ie/projects**

September 11: ESA Moon Camp launch **www.esero.ie/projects**

September 17: ESA Climate Detectives Kids launch **www.esero.ie/projects**

September 19: : ESA Mission X: Train like an Astronaut launch **www.esero.ie/projects**

OCTOBER

October 4 - 10: Space Week 2025 – Living in Space **www.spaceweek.ie**

October 4 - 10: ESERO Space Goes to School Programme **www.spaceweek.ie/space-speaker-in-your-classroom**

October 7: ESERO on Dream Space LIVE for Space Week Special **www.esero.ie/news-events**

October 10: ReelLIFE SCIENCE Video Competition deadline **www.reellifescience.com**

October 11 - 19: Maths Week **www.mathsweek.ie**

October 11 - 26: EU Code Week **www.codeweek.eu**

October 12 - 18: Earth Science Week **www.earthsciweek.org**

October 13 - 29: Bioeconomy Week **www.irishbioeconomy.ucd.ie/biw/**

NOVEMBER

November 3 - 7: Plan your Science Week Activities **www.scienceweek.ie**

November 9 - 16: Science Week **www.scienceweek.ie**

November 11: Curious Minds Science Week Show

November 10 - 14: Science Week ESERO Space Goes to School Programme **www.esero.ie**

November 10: The START Competition Registration opens **www.startcompetition.com**

November 12: Meet the Scientist Wednesday Webinar series begins **www.meetthescientist.ie**

DECEMBER

December 5: ESB Science Blast – Dublin Event Deadline **www.esbscienceblast.com**

JANUARY

January 7 - 10: Stripe Young Scientist and Technology Exhibition **www.btyoungscientist.com**

FEBRUARY

February 10: Safer Internet Day **www.webwise.ie/saferinternetday/**

MARCH

February 28 - March 6: Engineers Week **www.engineersweek.ie**

March 2 - 6: Engineers Week ESERO Space Goes to School Programme **www.esero.ie**

March 2 - 4: ESB Science Blast - Dublin Event **www.esbscienceblast.com**

March 5: ESB Science Blast Dublin Gaelscoileanna Event **www.esbscienceblast.com**

March 14: ESB Science Blast – Belfast and Limerick Event Deadline **www.esbscienceblast.com**

March TBC: Scratch Competition Entries Due **www.scratch.ie/competition**

March 22: UN World Water Day **www.h2oheroes.ie**

March 26: The START competition deadline **www.startcompetition.com**

MAY

May 1: Curious Minds Awards – Application Deadline **www.curiousminds.ie**

May 5: ESB Science Blast – Belfast Event **www.esbscienceblast.com**

May 15: The Start Competition Award Ceremony **www.startcompetition.com**

May 15 - 24: Biodiversity Week **www.biodiversityweek.ie**

May 19 - 21: ESB Science Blast - Limerick Event **www.esbscienceblast.com**

JUNE

June TBC: Curious Minds Award Ceremony **www.curiousminds.ie**

JULY/AUGUST

July 31: ESA Climate Detectives Kids final submission date **www.esero.ie**

Curious Minds / ESERO summer courses
www.curiousminds.ie

www.curiousminds.ie

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