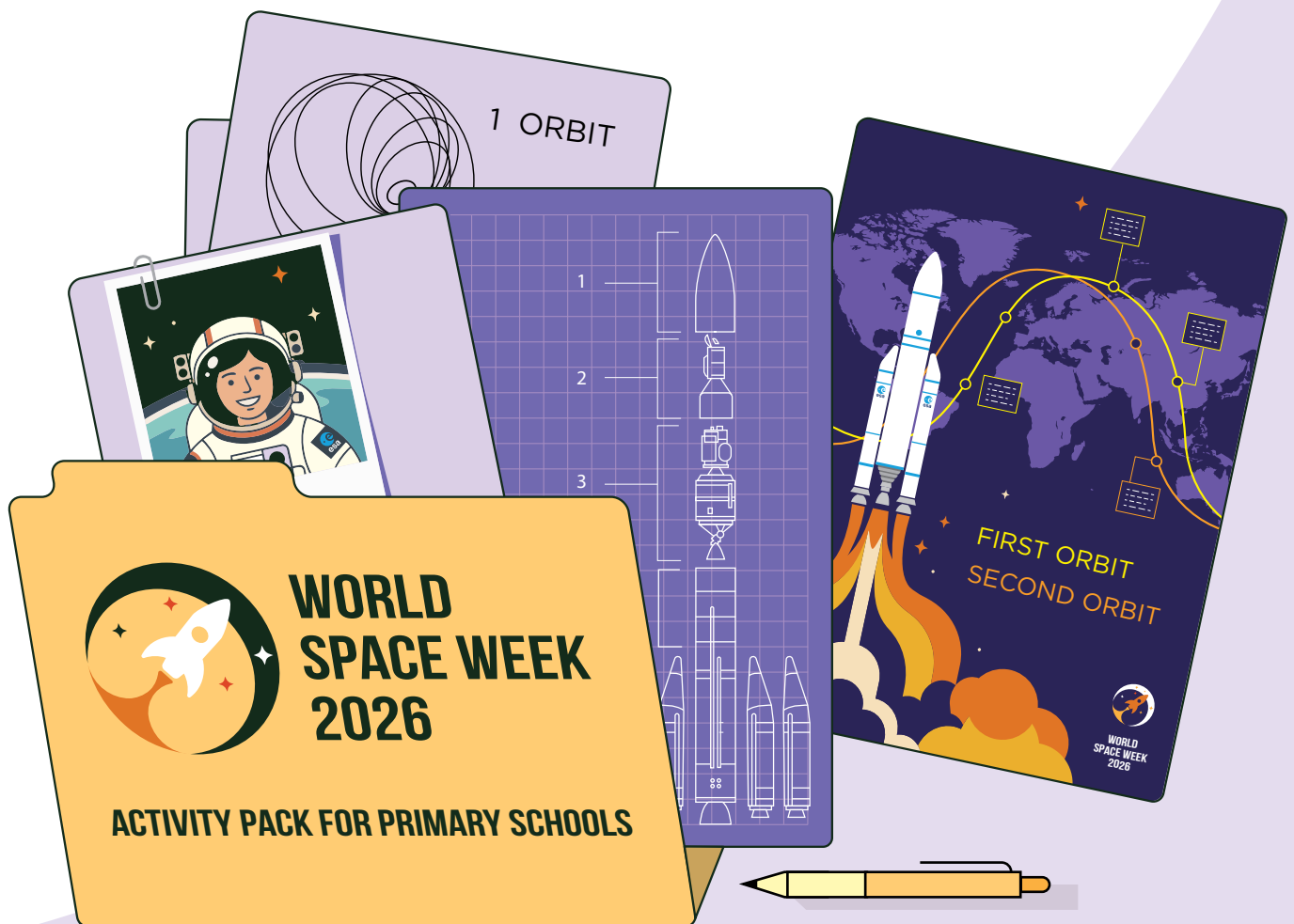


ESERO Ireland Space Week 2026 Activity Pack for Primary Schools



What is World Space Week?

World Space Week happens every year on the 4th – 10th of October. It is a special week that celebrates space, science, and the wonderful things we can discover in our Universe. Each year has a theme.

This year's theme is ***'Rocket Revolution'***.

Space Week is the perfect time to learn about space and imagine what it would be like to travel into space one day. This ESERO Ireland Space Week Activity Pack contains everything you need to know about Space Week 2026, from events you can be part of and projects you can get involved in, to activities you can try out in your own classroom!

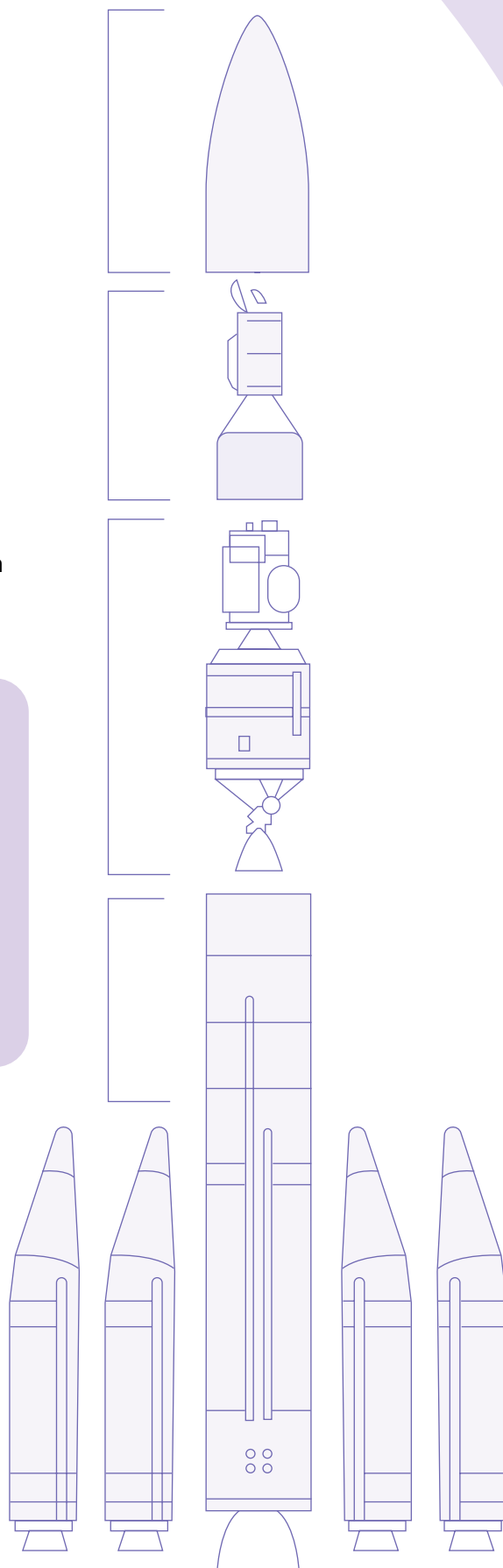


Why not start of your space week with a BLAST?!

Here is a video of an ESA rocket launch – you can play it in your class and get everyone involved – **launch in T minus 3...2...1... GO SPACE WEEK!**

On 15th September 2026, The European Space Agency (ESA)'s state-of-the-art FLEX Earth Explorer satellite and the Copernicus Sentinel-3C satellite launched together aboard a Vega-C rocket from Europe's Spaceport in French Guiana, marking a new milestone in Europe's Earth Observation Programmes. [Watch the launch here!](#)

Discover more and check for up to date Space Week event listings at esero.ie/spaceweek2026



Contents

What is World Space Week?	2
Who works in space? Not just astronauts!	4
What's on for Space Week 2026?	5
ESERO & Dream Space LIVE for Space Week	5
ESERO Space Goes to School	5
Space Week Events around Ireland	6
Town Scientist Dundalk Family Space Day	6
Alien Life Workshop Galway Atlantaquaria	6
Stargazing at Dublin Zoo	7
Sustainable Space Workshops	7
Space is not just for Space Week...	8
Space as a Tool for Teaching STEM	8
Astro Pi Challenge	8
Climate Detectives	9
Moon Camp Challenge	9
Mission X	9
Places near you to explore Space	10
DIAS Dunsink Observatory, Dublin	10
MTU Blackrock Castle Observatory, Cork	10
Mayo Dark Sky Park	11
Armagh Observatory and Planetarium	11
Birr Castle Demense, Offaly	11
Activities	12
ESA Spacecraft Materials Kit	12
Design and Make a Paper Rocket	13
Rocket Launch with a Balloon	19
Make a Foam Rocket and Investigate its Flight Path	21
Curious Minds / ESERO Ireland Framework for Inquiry	29
Who are we?	30
What is ESERO Ireland and what is Curious Minds?	30

Who works in space? Not just astronauts!



There are many different people who work in space and in areas related to space, and they need lots of different types of skills for the work they do.

Here are just some of the types of people who work on and in space, in Ireland, Europe, and around the world. Some people help find new places to explore in space, some like to think about how to live in space, and others like to build things on Earth that go into space!

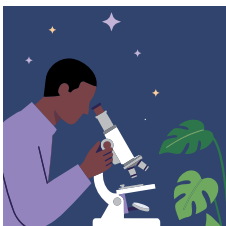
Let's meet some of my friends who work on space science and technology!

They have lots of different skills, like being good at teamwork, solving problems, and coming up with creative ideas!



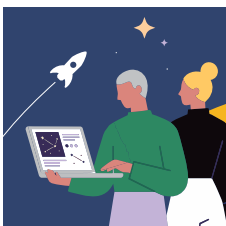
Astronomer

I look at the stars, far away galaxies, and the planets and moons in our solar system using really powerful telescopes on Earth and sometimes even telescopes in space. I need to be patient and good at analysing data using computer programmes and using my maths skills, and I am always thinking about how things are connected in space and where they came from!



Astrobiologist

I study plants and animals growing on Earth in very difficult and unusual or “extreme” places to try and understand how life might live on other planets or moons. I am interested in growing plants, and studying different things in lots of detail using microscopes to understand how they work!



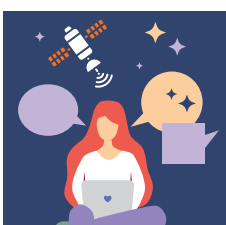
Computer Programmer

I write computer programmes to control the movement of satellites around the Earth like ones that study the weather, and to guide spacecraft like the rovers on Mars. I need to understand maths and coding languages and be good at problem solving and finding creative solutions!



Rocket Engineer

I like to design rockets that take people and robots into space and out to other planets and moons. I have to work out how much fuel I need for different missions and tell other people how much they can take up into space for each rocket launch. I need to understand maths and engineering and I'm good at fixing things!



Science Communicator

I write and talk about all of the amazing new discoveries space researchers make and how they find things out. I am great at explaining things so that everyone understands, so I need to understand enough about the discoveries to tell others! It's a big job to explain all the discoveries and the different types of jobs and people involved in space science and technology.

What's on for Space Week 2026?



ESERO & Dream Space LIVE for Space Week

Celebrating World Space Week and this year's theme, Rocket Revolution, experts from ESERO Ireland are delighted to join the Dream Space team for Dream Space LIVE.

Together, students will explore how gravity and thrust affect a rocket, consider the purpose of different rocket features and make their own engineering choices as they design a rocket for the journey from Earth into space, and get to grips with coding as they create a simple rocket game of their own!

The session is designed for upper primary and lower post-primary students, is run online and free for classes to join.

Find out more and register to take part at esero.ie/dream-space-live-2026



ESERO Space Goes to School

The ESERO Space Goes to School program brings real Space Industry professionals to your classroom via videoconference, for FREE! Your students will have a chance to learn from these experts and to engage with them.

Find out more and sign up at esero.ie/spaceweek2026



Space Week Events around Ireland

For more details and to book any of these events, and to see more, go to

esero.ie/super-space-week-events-26



Town Scientist Dundalk Family Space Day 2026 - The Rocket edition!

Location: Dundalk- Foresters Building and Library

Date/Time: 10th October 10:00-16:00

Across 3 locations in the town the Family Space Day will be out of this world! With Planetarium Shows, Space Camp activities, talks from space experts, and even a Rocket build and launch activity, there will be lots to take part in.



Alien Life Workshop Galway Atlantaquaria

Location: Galway Atlantaquaria

Date/Time: 5-9th October, 10:00-11.30

Take part in a creative hands-on workshop in Galway Atlantaquaria imagining how life might evolve on other planets. Students will evaluate and interpret the adaptations of aquatic animals which inhabit extreme environments on Earth.





Stargazing at Dublin Zoo

Location: Dublin Zoo

Date/Time: 3rd October 18:00-21:00

Look up and discover the wonders of the night sky at Dublin Zoo this World Space Week. Join us for an evening of space, science and stargazing, featuring an inspiring line-up of speakers, celestial explorers and expert stargazers.



Sustainable Space Workshops

Location: The Rediscovery Centre, Ballymun, Dún Laoghaire Lexicon, and Carrickmacross Library

Dates: 3rd, 7th and 9th of October

The Rediscovery Centre will be delivering Sustainable Space workshops for primary learners throughout Space Week. These workshops will include hands-on, interactive activities related to space, how space exploration can lead to discoveries here on Earth, and how we can do it sustainably.

For more details and to book any of these events, and to see more, go to esero.ie/super-space-week-events-26

Space is not Just for Space Week...



We can all enjoy and explore space any time of the year, not just during Space Week!

You can get your students involved with the ESA School Projects and take a trip to a space and astronomy focused spot in your area. Keep reading to find out more...

Space as a Tool for Teaching STEM

Bring STEM learning to life in your classroom with these exciting, hands-on projects from the European Space Agency (ESA) that inspire curiosity, problem-solving, and innovation. Each project offers students the opportunity to engage with real-world science and technology challenges, fostering inquiry-based learning and developing 21st-century skills. Whether it's coding for the International Space Station, designing a lunar habitat, investigating local climate issues, or training like an astronaut, these projects will captivate learners and provide valuable cross-curricular learning experiences.

Below are details on each project, complete with resources and instructions on how to get your class involved.

To find out more and register for the projects, go to esero.ie/projects/



Astro Pi Challenge

Engage Your Students with Real Coding in Space!

The Astro Pi Challenge, created by ESA and the Raspberry Pi Foundation, offers an incredible opportunity for your students to send their code to the International Space Station (ISS). This project helps students learn hands-on programming using Raspberry Pi and create pixel art images on the LED matrix to display to the astronauts on the ISS!

This project is ideal for introducing coding, data analysis, and space science in an engaging and practical way. Teachers can access lesson plans and activity guides to integrate the challenge into their classroom.

For registration and additional information, visit esero.ie/astro-pi



CLIMATE DETECTIVES

Climate Detectives

Investigate Climate Change with Your Students!

Empower your students to tackle real-world climate issues with the Climate Detectives project by ESA. This initiative allows students to become young climate scientists. They can complete Earth related activities, collect evidence and earn Detectives badges.

For registration and additional information, visit esero.ie/climate-detectives



MOON CAMP

Moon Camp Challenge

Help Your Students Design Space Habitats!

Get your students thinking about space exploration with the Moon Camp Challenge, a project run by ESA and the Airbus Foundation. In this challenge, students will design a lunar base capable of sustaining human life on the Moon, or a space base further afield in our Solar System. They will explore the challenges of living in extreme environments and then create a model of their solution.

For registration and additional information, visit esero.ie/moon-camp



MISSION X

TRAIN LIKE AN ASTRONAUT

Mission X

Train like an astronaut!

Challenge your students to complete real astronaut-inspired training missions that combine physical activity with scientific investigation and get them ready to train like space explorers do! Through fun physical exercises and science investigations, students develop key skills while helping mascots Luna and Leo on their virtual journey to the Moon.

For registration and additional information, visit esero.ie/mission-x

Places near you to explore Space

Across Ireland, from Cork to Armagh and Dublin to Mayo, there are amazing places to go and explore space and astronomy. Find one near you below and contact them to plan a trip!



DIAS Dunsink Observatory, Dublin

www.dunsink.dias.ie

DIAS Dunsink Observatory is a historic astronomy centre located in Dublin. The observatory has several telescopes and is connected to astronomy research and education in Ireland. It is also famous for being the workplace of mathematician and astronomer William Rowan Hamilton. Today, Dunsink is an important part of Ireland's astronomy history and helps people learn more about space and science.



MTU Blackrock Castle Observatory, Cork

www.bco.ie

MTU Blackrock Castle Observatory brings together the castle's rich history with the fascinating worlds of astronomy and space. Whether you're planning a visit, or simply want resources to elevate your day-to-day teaching, Blackrock Castle Observatory has everything you need for all things Space.



Mayo Dark Sky Park

www.mayodarkskypark.ie

Wild Nephin National Park becomes **Mayo Dark Sky Park** at night. The site is completely free to access anytime, day or night and they have 3 signature viewing sites for you to choose from where the night sky is very dark because there are very few artificial lights. Mayo Dark Sky gives people the chance to enjoy and learn about space while experiencing the beauty of the night sky.



Armagh Observatory and Planetarium

<https://armagh.space>

Armagh Observatory and Planetarium is a space and science centre in Armagh, Northern Ireland. Visitors can watch shows about space inside a special dome that looks like the night sky. The planetarium also has activities and displays about astronomy and science. Armagh Planetarium is a great place for people who are interested in astronauts, planets, stars and exploring the universe, and also supports astronomy education and research.



Birr Castle Demense, Offaly

www.birrcastle.com

Birr Castle was home to the largest telescope in the world in the 19th and 20th century, called the Leviathan telescope. Scientists used it to study stars, planets and galaxies, and to discover details about spiral galaxies. Today, a state-of-the-art radio telescope, I-LOFAR is also at Birr Castle and visitors can see both telescopes and learn about how people studied space in the past, and how they do so today too!

Activities

Time to get hands-on and be part of the World Space Week 2026 **Rocket Revolution!**

Here are detailed activity plans to build a range of different types of rockets in your classroom, using simple materials like paper, foam insulation, and balloons, as well as a Framework for inquiry based learning, and a kit you can use to see which materials make the best spacecrafts.



Which rocket is the best?! Test them all to see which one can go the furthest and the fastest!

ESA Spacecraft Materials Kit

Looking for something new to do with your class? Students can use the ESA Spacecraft Materials Kit to experimentally investigate a variety of different materials to determine the best material to build a spacecraft.

A set of five activities enables pupils to get acquainted with the properties of different materials, comparing and grouping everyday materials based on: electrical conductivity, thermal conductivity, mass, magnetism, and resistance to impact. Pupils will consider which materials are best suited for different parts of a spacecraft.

The ESA Spacecraft Materials Kit can be used in many ways, including as a resource for your Moon Camp project!

Available to borrow from Education Centres around Ireland, see esero.ie/spacecraft-materials-kit for more information and to find one near you.



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DESIGN AND MAKE A PAPER ROCKET



BASED ON AN ACTIVITY FROM THE INTERNATIONAL SPACE STATION (ISS) EDUCATION KIT

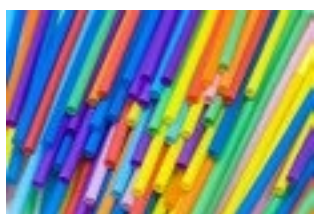
Learning Objective

"The child should be enabled to become aware of and explore how moving air can make things move"
(SESE: Science Curriculum page 45).

Strand: Energy and Forces. Strand Unit: Forces

Equipment

A4 sheet of paper, straw (wide diameter if possible), scissors, pencil (of approximately the same diameter as the straw), sellotape and measuring tape.



Suggested Class Level

Middle and Senior

(some of the Middle children may need help, especially starting rolling the paper at the correct angle round the pencil).

Preparation

Collection of materials.

This activity can be designed and made in the classroom, but a larger space such as the school hall, or outdoors on a still day, would be desirable for launching the rockets.

A starting point should be marked out for the launching.

Background information

(Technically the paper rocket is a rocket in appearance only.

Real rockets get their energy from burning fuels emitting gases from the back of them, which send them forwards. See DPSM activities 'Rocket Launch' and 'Make a Rocket' which are based more on the principle of real rockets).

Moving air can move many things. A light breeze can move leaves on trees, while a hurricane can cause great damage to buildings and even blow ships onto rocks. Electricity is made on wind farms from moving air. Sailing ships rely on moving air to drive them. (See DPSM Junior activity 'Moving Air').

(Trapped air can also have a good deal of power.

See under 'Pneumatics' in 'Air and Water Power' Activity).



DESIGN AND MAKE A PAPER ROCKET

Prompt questions

What is the hardest part about going into space?

(Getting off the ground!).

Why is this?

(The strong pull of Earth's gravity brings things back to the ground).

So how does something huge and heavy like a spacecraft manage to break away from Earth's gravity?

(A powerful rocket blasts it into space).

What is a rocket?

(A cylinder full of materials which produce gases).

How does it work?

(Gases going out the back of the rocket push it forward, like an untied blown-up balloon goes forward when you let it go while the air goes out the back).

Where do these gases come from?

(From burning fuel).

For something to burn what do you need?

(Air/oxygen)

But there is no air in Space! So how do the fuels burn?

(Rockets carry their own oxygen with them).

Content

Science:

Forces

Maths:

Number: Operations
(averages)

Measures: Length

Shape and Space:
2-D shapes (circle),
3-D shapes (cone),
Lines and Angles

Data: Representing
and Interpreting

Skills

Investigating (Fair Testing)

Estimating and Measuring

Designing and Making,
Recording, Analysing

Cross-curricular links

Geography: Planet Earth in
Space

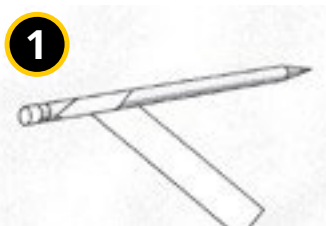
Art: Rocket Design

Activity

Children should be encouraged to Design and Make their own rocket, given the above materials. One possible suggestion is as follows:

Cut a strip, 5 cm. wide, from the long side of an A4 sheet of paper. Then:

1. Starting at one end of the pencil, hold the paper at an angle of approximately 45° to the pencil.



2. Roll the paper strip around the pencil fairly tightly until you get to the other end.



3. Tape the tube at each end and at the middle of the rocket.



DESIGN AND MAKE A PAPER ROCKET

4. Cut off both ends of the tube.

4



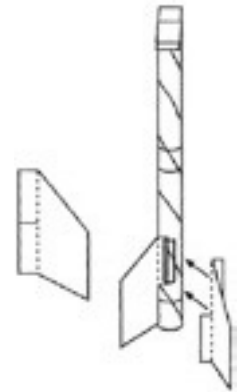
5. Fold the upper end firmly and tape it.

5



6. Design the rocket's nose* and fins.

6



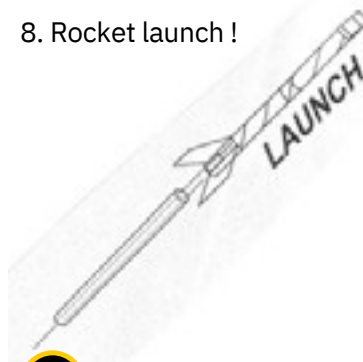
7. Launch the rocket by inserting the straw in the open end and blow.

7

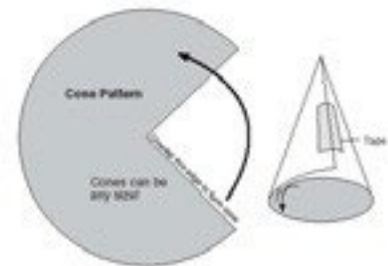


8. Rocket launch !

8



*One possible way of making a nose cone is as follows: draw and cut out a circle, then remove a segment from the circle. Overlap the straight edges and tape down.



Can they make a cone from a quarter of a circular disc?

Maths

- The children should predict how far their rocket will go.
- What instrument will they choose to measure the actual distance?
- How will they decide what to measure in order to make it a fair test? (i.e. they need to decide what part of the rocket is being used for the measurement, so that it is the same for everybody)
- They should launch their rockets a number of times, firstly estimating the distances travelled , and then measuring them and taking the average distance.

DISTANCE TRAVELLED (cm)			
1st go	2nd go	3rd go	Average

DESIGN AND MAKE A PAPER ROCKET

- Does the angle make a difference to the distance travelled?
- Does it make a difference how far you push the straw into the rocket when you blow?
- If students have done the DPSM Foam Rocket activity, can they compare the two types of rocket for (a) distance travelled; (b) accuracy in relation to Fair Testing (e.g. the angle of launching).

REMEMBER: FOR FAIR TESTING - ONLY CHANGE ONE THING AT A TIME.

Further Question:

What do you think might happen if air leaks out of the nose of the rocket? Try and see!

Why do you think this might happen?

Safety

Do not point the rocket at other children when you are launching it - even though it is soft it might frighten them.

Follow-up activity

1. Try out different lengths of rocket. Does a longer or shorter rocket make a difference to the distance it travels?

Length of Rocket (cm)	DISTANCE TRAVELLED (cm)			
	1st go	2nd go	3rd go	Average

Conclusion.....

2. Experiment with different shapes of fins and noses

Is there any difference in controlling the direction of the rockets between those with fins and those without fins?

Does the shape of the nose make any difference?



(made by Celine Lynch at 'Space' summer course at BCO, Cork, July 2013).

DESIGN AND MAKE A PAPER ROCKET

3. Can you think of any other ways of making a paper rocket which might go further?
4. Larger pencils could be tried with larger straws (available from Art and Craft catalogues) to see if these rockets would go further.



Children Can:

- Find out what rockets have been used for in various places down the years.

Did You Know?

- Sound needs something to travel through. Because Space is a vacuum (i.e. nothing there at all, not even air) astronauts use radios to talk to each other. (Radio waves can travel through a vacuum).
- Some of the discoveries during Space research have various uses on the ground: e.g. solar cars, dental work, 'cot death' prevention, and potato crisp factories getting crisps into bags quickly without breaking them!



- In 1865 the science fiction writer Jules Verne suggested using a powerful gun to send people to the Moon!

- Rockets were invented in China over 800 years ago. The first ones were very simple - a cardboard tube packed with gunpowder and attached to a guide stick - a bit like the fireworks we use today.



- A space shuttle is a launch vehicle that blasts into space like a rocket, but it comes back to land on a runway, and can be used again and again.

- Satellites - which beam TV pictures and phone calls around the world, watch the weather, and do lots of other things - are launched into space by rockets or space shuttles.

DESIGN AND MAKE A PAPER ROCKET

Useful Websites:

- There is lots more information about rockets on the European Space Agency's website for kids:
http://www.esa.int/esaKIDSen/SEMOWIXJD1E_Technology_0.html
- For lots of activities and information about rockets, astronauts, space exploration, space shuttles, solar system, and galaxies, have a look at the American Space Agency's Kids Club:
www.nasa.gov/audience/for_kids/kidsclub/flash/index.html

Visit the websites of three space-related Discover Science Centres:

Blackrock Castle Observatory, Cork www.bco.ie

Birr Castle (home of the giant telescope - the Leviathan), Co. Offaly www.birrcastle.com

Armagh Planetarium, Co. Armagh www.armaghplanet.com



Rocket Launch



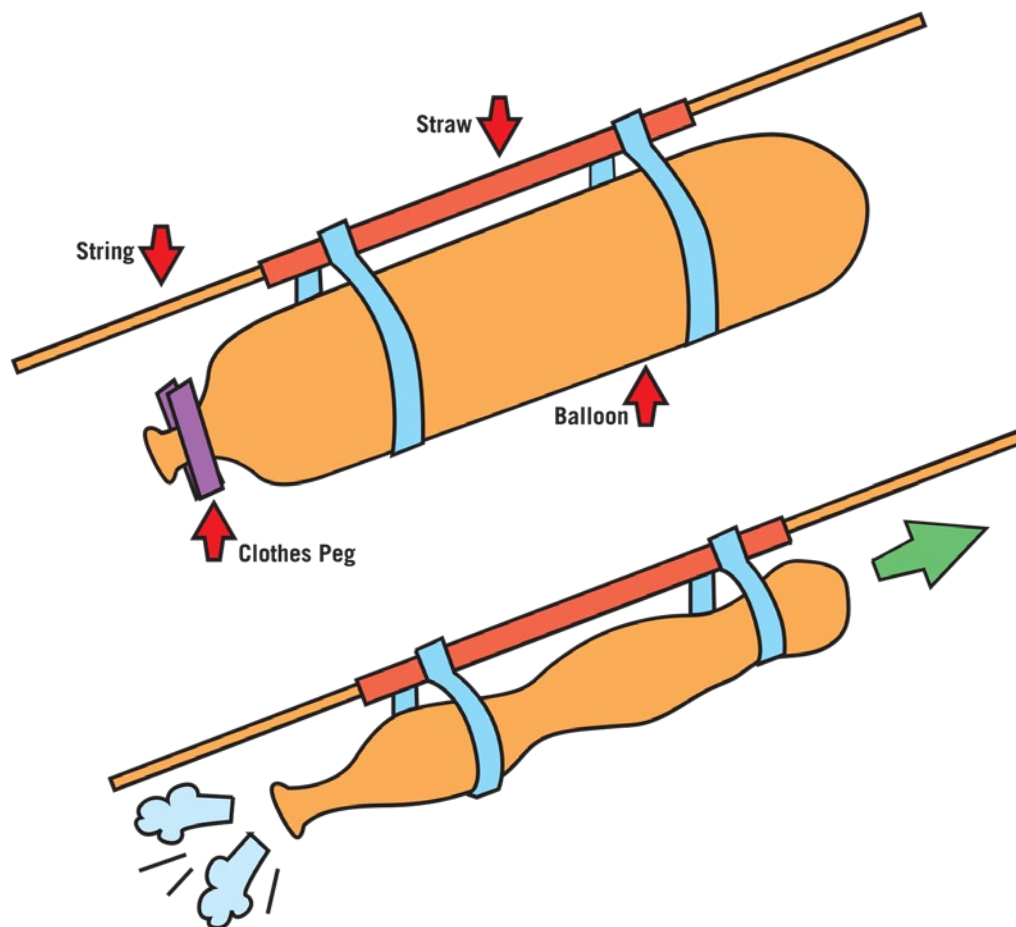
EQUIPMENT	Large balloons (long shaped) (Round ones will work but the long balloons look more like a rocket.), Balloon pump, String OR cotton thread OR fishing line 3-4 m long, Drinking straw, Clothes-peg, Sellotape, Two chairs
PREPARATION	Collection of materials
BACKGROUND INFORMATION	The air coming out of the back of the balloon pushes the balloon forward. This is how rockets work – the hot burning gases rushing out the back of the rockets push them forwards.
SKILLS	Investigating and experimenting
ACTIVITY	Blow up a long shaped balloon and let it go. Notice what happens. <i>(The balloon will travel off in random fashion as the air rushes out the back of it.)</i> Now control the path of the balloon by connecting it to a piece of string. <i>(The balloon will whiz along the string.)</i> Care with the string.
SAFETY	





Rocket Launch Continued

1. Blow up a long-shaped balloon and let it go.
2. Notice what happens.
3. Pull string through a drinking straw.
4. Tie the string to two chairs and pull it tight.
5. Blow up a long-shaped balloon and keep the air in it using a clothes peg.
6. Using sellotape attach the balloon to the side of the straw.
7. Pull the whole thing back to the beginning of the string and take off the clothes peg and ...launch your rocket!





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Classroom Resource

Make a Rocket and Investigate its Flight Path



Design Challenge

Make a Rocket and Investigate its Flight Path

Class Level – Senior

Curriculum Links

Strand:	Energy and Forces
Strand Unit:	Forces
Curriculum Objectives:	Identify and explore how objects and materials may be moved
Skills Development:	Design and Make - Explore, Plan, Make and Evaluate; Working Scientifically – Questioning, Observing, Predicting, Investigating and Experimenting, Estimating and Measuring, Analysing, Recording and Communicating
New words / vocabulary:	Angle of launch, force, trajectory, projectile
Focail nua:	Roicéad (Rocket), Laineáil (Launch)
Cross curricular links:	Maths – 2D and 3D shapes, measurements, angles; History of flight; PE – throwing and kicking balls
Equipment / materials	• For foam rockets: foam pipe insulation, wide rubber band, duct tape, cardboard (for fins), scissors, ruler • Other materials such as cardboard tubes, plastic bottles etc. can be substituted for pipe insulation • For launching and measuring: metre stick (and launcher quadrant pattern provided), long tape measure / trundle wheel



Engage

Prompt questions / wondering:

- What are rockets? Cylinders full of materials which produce gases.
- How do they work? Gases going out the back of the rocket push it forward, like an untied blown-up balloon goes forward when you let it go and the air goes out the back.
- What are rockets used for? Sending objects into the air with great force to escape Earth's gravity.
- If you sent your rocket straight up into the air, where do you think it would land?
- If you want to throw or kick a ball a very long distance, how would you throw or kick it?
- Does the angle matter?
- What force will send our rocket up?
- What force will bring it down again? Gravity.

Background information:

This foam rocket is based on stored energy. When you pull back the elastic band, the elastic band stores this energy. When you let it go, it releases this energy as it returns to its original length. The foam rocket is stabilised by the fins, which keep it pointed in the desired direction.

Technically the foam rocket is a rocket in appearance only. Real rockets get their energy when burning fuels emit gases from the back, which, in turn, send the rocket in the opposite direction. Things that are sent into the air, and that have no energy source of their own (e.g., a ball, javelin) are called projectiles. Gravity gradually brings them down.

Real-world application:

The flight path or trajectory of the rocket depends on the angle of launch and the force applied (the amount of energy stored in the elastic by pulling it back). These same factors apply in the case of any object that is thrown or kicked, such as a ball.



Design Challenge

Explore

Show the learners a foam rocket and demonstrate how it works. Either show them how to make the basic model as suggested below or provide some pre-made ones. One rocket per group should be enough for initial exploration.

Making the Rocket

- Using scissors, cut one 30 cm length of pipe insulation for each rocket.
- Cut four equally-spaced slits, each about 8 cm long, at one end of the tube. This will be the tail of the rocket. The fins will go into these slits.

Front of rocket

- Cut a 12 cm length of duct tape down the middle to make two pieces. Place one piece over the other, sticky to shiny side, to make the tape extra-strong.
- Place a single strand of a rubber band across the top of the foam tube.
- Tape the rubber band down to the tube, using the double strength duct tape at right angles to the rubber band.
- Press the tape down to the sides of the tube.
- Reinforce this tape with another length of tape wrapped around the top end of the side of the tube.

Back of rocket

- Cut four fins from cardboard. A suggested way is as follows: Cut a 10 cm square, draw a diagonal and cut along the diagonal (forming two isosceles triangles).
- Cut halfway down the height of one triangle and halfway up the other. Now nest the fins together and place them in the slit.
- Close off the slits with another piece of duct tape wrapped around the foam tube.

Launching the rocket

- Loop the rubber band at the top of the rocket over the end of the metre stick.
- Pull on the bottom end of the rocket, holding it below the fins as you point it up into the air.
- Now let the rocket go.
- What happened to the rocket?

Allow the learners to explore with the rockets. The best place for launching is outdoors on a calm day as the rockets will travel quite far. Alternatively, a school hall can be used: the larger the better. Learners should explore how they can make their rocket travel as far as possible. Could they improve the design to make it travel further? Could they change something about the way it is launched?

Plan

Learners should look at the rocket they have been exploring with. How could they improve the rocket's design to make it travel further while still using the elastic band to launch it? In planning, they might consider:

- The materials used – they may decide to construct their rocket from recycled materials such as a toilet roll / kitchen towel tube, an empty plastic bottle or even an old sock.
- The fins – they may decide to use a different material for the fins, to make them a different size or different shape or to place them in a different position.
- The size – they may decide to make their rocket shorter or to use a different pipe insulation diameter.

Once they have decided on materials, the learners should draw a plan of their rocket with materials and measurements. This will be useful if they want to adapt their design.

Make

Groups make their rocket according to their plans.

Evaluate

The following questions may help with rocket testing and evaluation:

- How far can your rocket travel? Can it travel further than the first foam rocket you tried?
- Is your rocket strong enough? Does it stay together when you pull back the elastic to launch it?
- Are you happy with your design? What do you think you could do to improve it?
- If you want to improve your rocket, use your initial plan to make a new rocket. Change one variable at a time and retest.

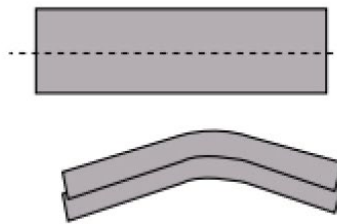
1

Cut four slits 12 cm long 90 degrees apart.

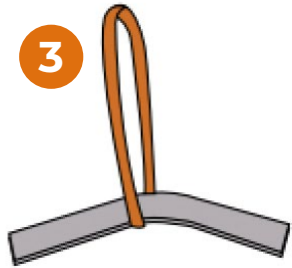


2

Cut 12 cm strip of duct tape in half lengthwise. Place one strip on top of other.



3



4

Tape launcher rubber band to nose end of rocket.



Add tape strip around the nose to strengthen the attachment.



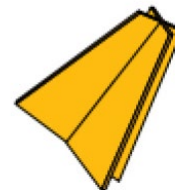
5

Cut out fins with notches.



6

Slide fins together.



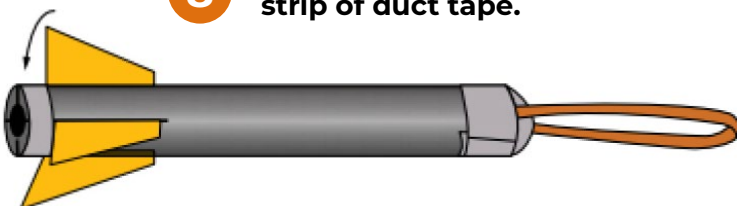
7

Slide fins into slits.



8

Close fin slits with narrow strip of duct tape.



Ready for flight!

Investigate

Use your rocket to design a fair test investigation. Each group should come up with a testable question and change one thing about the way their rocket is made or launched. Some possible testable questions are suggested below. For fair testing, remember to only change one variable at a time, e.g., if changing a design feature such as rocket length, all other design features and all launch conditions should be kept the same.

Testable questions

Launch conditions

- How does the angle of launch affect the distance travelled?
- How does the force (the amount of stretch on the elastic) affect the distance travelled?
- How does the wind direction affect the distance travelled (launched with the wind, against the wind, across the wind)?
- How does the position of launch (standing, sitting, kneeling) affect the distance travelled?

Design Features

- How does the size of the fins affect the distance travelled?
- How does the length of the rocket affect the distance travelled?
- How does the position of the fins affect the distance travelled?

Prediction

Groups should make a prediction based on their chosen question, e.g., "I predict that the rocket will travel furthest at an angle of 30°".

Conducting the investigation

- Groups should discuss how to carry out their investigation and how to make it a fair test. They should record their data in some way (tables, graphs, video).

The following is a suggested way to compare the launch angle to the distance the rocket travels:

- Print out the launcher quadrant pattern provided onto card.
- Cut out the pattern and fold it on the dashed line.
- Tape the quadrant to the metre stick so that the black dot lies directly over the 60 cm mark on the stick and the long arm points towards the 10 cm mark.
- Press a drawing pin into the black dot.
- Tie a string to the drawing pin and hang a small weight (e.g., plasticine) to the string. Make sure the string hangs freely.
- Loop the rubber band over the end of the metre stick. Pull on the fin end of the rocket until the nose is aligned with the 30 cm mark.
- Tilt the launcher up at the chosen angle as indicated with the string and weight on the quadrant.
- Release the rocket and measure the distance travelled. To help measure long distances, the learners can measure and place markers at 1 metre intervals, starting at 5 metres and going up to 20 metres.
- The launch should be repeated three times for each angle to determine an average distance.

How will you make this a fair test?

- What will you keep the same? – use the same rocket each time, stretch the rubber band the same distance each time, e.g., the nose is aligned with the 30 cm mark on the metre stick, start from the same position, launch in the same direction.
- What will you change? The angle of launch.
- What will you measure and record? The distance travelled (measured along the ground).

Sharing data/results

Groups should present their findings to the rest of the class.

Take the Next Step

Adapt for home:

The rocket could easily be constructed and tested at home using readily available materials such as toilet roll inserts.

Adapt for junior/senior level:

The rocket can be quite challenging to construct, especially the attachment of the elastic band and the cutting of evenly spaced slits in the foam. Younger classes may need help with construction or to be given pre-cut slits and/or fins.

For testing, younger classes could be challenged to hit a particular target, such as a hula hoop on the ground, an empty bucket or a particular line on the basketball court. They could discuss pointing the metre stick in a different direction or pulling back the rocket further without having to measure. Leaning the metre stick against the seat and back of an infant chair can be a good way to keep the angle the same without having to measure.

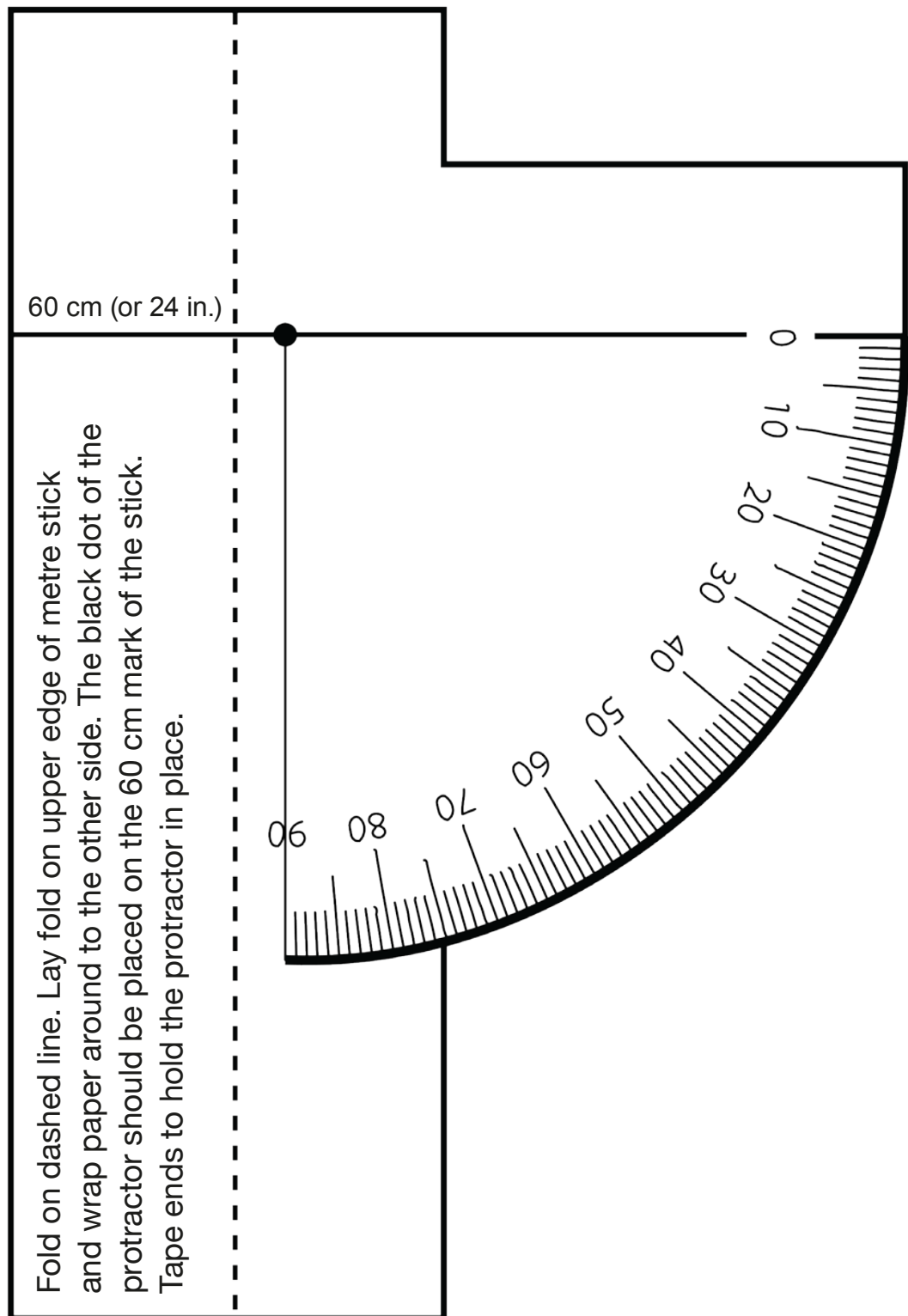
Follow-up challenge/project/citizen science link:

- Look at people playing sports such as ball sports, such as archery, javelin, darts or watch videos. Look at the trajectory of the ball/arrow/dart. How does it compare to your rocket launch?
- Research how real rockets are launched. How much fuel is used? Where are they launched from and why? What are rockets used for?



Launch Quadrant Pattern

(Actual Size)



THEME	Overall theme		
CURRICULUM	Strand:		
	Strand Unit:		
	Curriculum Objectives:		
	Skills Development:		

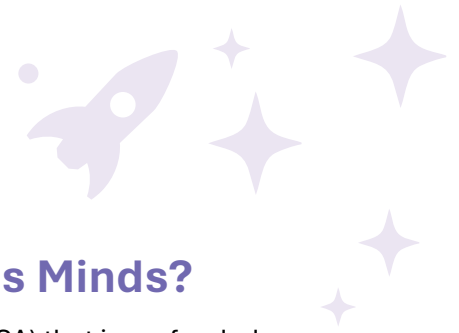
ENGAGE			Considerations for inclusion
THE PROMPT	WONDERING	EXPLORING	

INVESTIGATE			
STARTER QUESTION	PREDICTING	CONDUCTING THE INVESTIGATION	SHARING: INTERPRETING THE DATA / RESULTS

TAKE THE NEXT STEP		
APPLYING LEARNING	MAKING CONNECTIONS	THOUGHTFUL ACTIONS

REFLECTION	
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Who are we?



What is ESERO Ireland and what is Curious Minds?

ESERO Ireland is an education project of the European Space Agency (ESA) that is co-funded by Research Ireland while also working with national collaborators. Our aim is to spark young people's passion for STEM (science, technology, engineering, maths) through the exciting world of space, build their skills, and empower them to pursue careers in space. We also raise awareness of the vital role space research, exploration, and applications play in shaping modern society, using engaging resources and creative teaching methods, and inspiration from role models.

Find out more at esero.ie, and follow us on social media **@ResearchIreland**.

Curious Minds is part of Research Ireland's Education and Public Engagement activities and supports schools to develop the innate curiosity of children through a hands-on, inquiry-based approach to STEM learning. The Curious Minds programme supplies the tools to empower schools in teaching STEM, allowing teachers to spark fun and curiosity both inside and outside the classroom. Our goal is to help establish your school as a leading educator in STEM (Science, Technology, Engineering and Maths), creating a forward-focussed learning environment for both teacher and student.

Find out more at curiousminds.ie, and follow us on social media **@ResearchIreland**.

