

SCIENCE WEEK

#scienceweek

7-14 Nov 2021

Supported by Science Foundation Ireland

CREATING OUR FUTURE: TRANSPORT

Classroom Resource Booklet



INTRODUCTION

**CREATING
OUR
FUTURE**

Creating Our Future is a Government of Ireland campaign to stimulate a national conversation between everyone in Ireland on their ideas on how to make our country better for all. While we might not always think about it, research and innovation affect nearly every part of our lives. The COVID-19 pandemic in particular has shown the importance and value of research and innovation in our lives – medically, socially, politically, and economically. Ideas are the starting point for all research and innovation. Anyone, anywhere can have an idea that inspires research and innovation. It could be based on an opportunity or challenge that someone has identified in their own life, for their community, for Ireland or for the world. Or it could be based on a topic that someone is curious or passionate about. Creating Our Future wants to hear them all – in particular from primary school learners. All ideas will be captured and will help inform the future direction of research and innovation in Ireland.

Science Foundation Ireland is inviting primary schools to get involved in the process of generating ideas. We will be introducing six themes over a period of six weeks and presenting a lesson resource on these themes.

Each resource will incorporate some different ideas for introducing the topic in your classroom with trigger questions to aid discussion, a related science investigation or design and make project and some ideas for carrying out your own research on the topic. The resource is not designed as a complete lesson plan but rather some suggestions to inspire you to create your own lesson on the theme. Teachers can choose to engage with any of the resources or even all six. For Science Week, we are asking teachers to capture their learners' ideas and submit them to Creating Our Future to ensure that the ideas and voices of primary school students are incorporated into Creating Our Future. Fill out our PowerPoint template during Science Week or in the weeks leading up to Science Week. Each learner will create a slide with their idea for the future of research in Ireland in one sentence, along with any images, drawings or anything extra that they would like to add in. Email this presentation back to creatingourfuture@sfi.ie and present your ideas to another class in your school as part the show and tell step (step 5) of your Discover Primary Science and Maths Award! More information can be found at CreatingOurFuture.ie

BACKGROUND

This week's theme is Transport. With around 20% of Ireland's Greenhouse Gas emissions coming from transport with large increases in recent years, we need to think about how we get around. We can change the way our vehicles are powered and make them more energy efficient. We can develop more public transport routes to cut down on private cars and we can also make walking and cycling safer and easier. Changing the way we get around can not only help us achieve some of our targets in combatting climate change but can also improve our air quality and make us healthier but we also need to ensure that transport is accessible to all and that improving our transport infrastructure does not destroy natural habitats and have a negative impact on biodiversity.

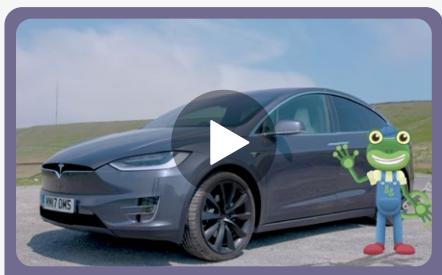


TRIGGER QUESTIONS FOR DISCUSSION



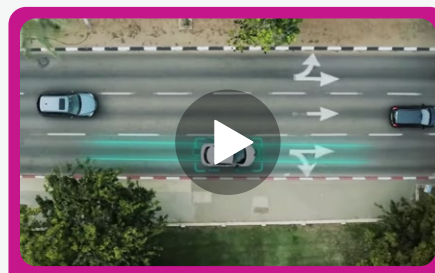
Cars

Are electric vehicles the cars of the future?



Source: YouTube - Toddler Fun Learning

Where will the electricity come from to power these cars? What about the batteries – will we have enough resources to make them? How can we make it easier to charge electric vehicles?



Source: YouTube - Top Electric

What about hydrogen powered cars?



Source: YouTube - BBC News

Many companies have already developed self-driving cars but how will these self-driving cars make decisions? Machine's Eye View, an artwork by Peter Nash looks at some of the scenarios a self-driving car will encounter while making its way around its environment.



Source: YouTube - SFI Discover

Check out the full resource which is included in our STEAM Art Collaboration booklet



TRIGGER QUESTIONS FOR DISCUSSION

Public Transport

Is public transport an easy way to get around our cities? There was a video with over 7 million views on YouTube in which someone tried to race the tube from one station to another on foot, and succeeded.

But is public transport always accessible to everyone? Have a look at the following video of a wheelchair user attempting the same challenge.

22ND SEPTEMBER 2014
1.23PM BLACKFRIARS

Source: YouTube - TheFreeHelpGuy

Can our public transport be powered by electricity?



Source: YouTube - Harris Group



Are there other ways to power public transport?
What do you think about the maglev train?

What is a maglev train?

Source: YouTube - Nathan Nagle



Walking and Cycling

How can we make cycling and walking easier and safer. What do you think of this school who closed their carpark for one day to encourage active travel to school



Source: YouTube - Sustrans

What do you think of this cycle path in South Korea that runs down the middle of a motorway?



Source: YouTube - Gwen

Did you know there are 4000 km of way marked walking trails in Ireland? Imagine walking them all!

How can we protect Biodiversity while making new walking and cycling trails?



Source: YouTube - Tough Soles

RESEARCH PROJECT IDEAS

Plan a trip around Ireland in an electric car. How often will you need to recharge and where will you do it? Which type of car will you choose: which has the best range, which is affordable? The SEAI website has information on range and costs of different models.

Read more

Do we have enough public transport options in Ireland? Plan a long distance trip from your home to another part of Ireland using only public transport. How long will it take to get to your destination? Do you need a car to get to your nearest train or bus station? What are the advantages and disadvantages of travelling this way?

Do a transport survey in your school and graph the results – why not try a human bar chart instead of plotting it on paper? What could your school do to encourage sustainable travel?

DESIGN AND MAKE ACTIVITY: THE TRAVELLING SPACE BUGGY

Space travel will also become much more common in the future as we improve the technologies to explore space. Private companies are now even exploring space tourism. The design and make activity here, which is adapted from an ESERO resource (The Travelling Space Buggy), encourages you to design a vehicle for travelling on an uneven surface on Mars but you could design a vehicle for any purpose. Think about the features you would like to have on your vehicle and how it will be powered. You could even try making it wind powered or adding magnets or an electric motor. A wheelchair is also a form of transport. The video for our Engineers Week activity on Designing and Making a Wheelchair has some useful tips on wheels and axles that you could use for any vehicle.



Source: SFIDiscover

ACTIVITY

THE TRAVELLING SPACE BUGGY

Space engineering

Discover Primary Science and maths
www.primaryscience.ie

Ireland **esero**

Design Challenge

30 MINS

Your Space Buggy

Examine a photograph of the Mars Lander and discuss the characteristics that help it to move along the surface of the planet.

An effective space buggy has the following characteristics:

- It is stable and is not easy to blow over (low centre of gravity)
- It can move forwards
- It can move over obstacles

Empty out a container of materials and examine the materials available for them to use. Sketch out a space buggy design and using the available materials, build a buggy that looks like the design. Provide assistance where needed.

Review the completed space buggies together and test out the buggy's movement.

- Is it strong? Try blowing against the space buggy to see if it falls over.
- Can it move over obstacles? Try moving the buggy over different surfaces.

Following this, evaluate the individual designs to see what design elements worked well and what could be improved on. After evaluating, adapt the space buggies, improving on your previous design so your buggy is better equipped to meet the requirements.

For example, you could make them heavier; they could change the position of the wheels, or use larger or smaller wheels.

This is one example of making a space buggy! Why not have a look in your recycling bin for materials to design your own space buggy?

If you share photographs of your space buggies on social media don't forget to tag us so that we can see your amazing creations! #DPSM

This activity can be used as part of your Discover Primary Science and Maths Award application!

Learning outcomes

- Understand how the different components of a vehicle work
- Identify the specifications and materials needed to travel on different surfaces
- Learn how to adapt designs to improve their movement

Suggested Materials

<ul style="list-style-type: none"> 1-litre drink cartons Containers Coloured card Wooden skewers Scissors Glue 	<ul style="list-style-type: none"> Paint Toilet paper rolls Large and small buttons Different surfaces e.g. sand, stones, carpet
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Engage

Discuss in a group how vehicles move and what components they need in order to move. Have a think about how vehicles travel over different surfaces, from smooth or bumpy surfaces to surfaces with lots of obstacles. Are certain types of vehicles better able to move over rough surfaces than others?

And if so, what features allow them to do so? What characteristics do you think a vehicle should have if it will be travelling over the surface of Mars?

Perhaps you could sketch out an everyday vehicle and add improvements that would allow it to move around on Mars!

Take the Next Step

30 MINS

Investigate how the space buggy moves over different surfaces. This can range from sand and stones to any surfaces you can find in your school grounds.

Now that the experiment to move the space buggy is complete, see how far their buggy can travel with a passenger!

Olympus Mons - the largest known volcano in the solar system!

Image of the Mars Lander

Ireland **sfi**
Science Foundation Ireland For what's next

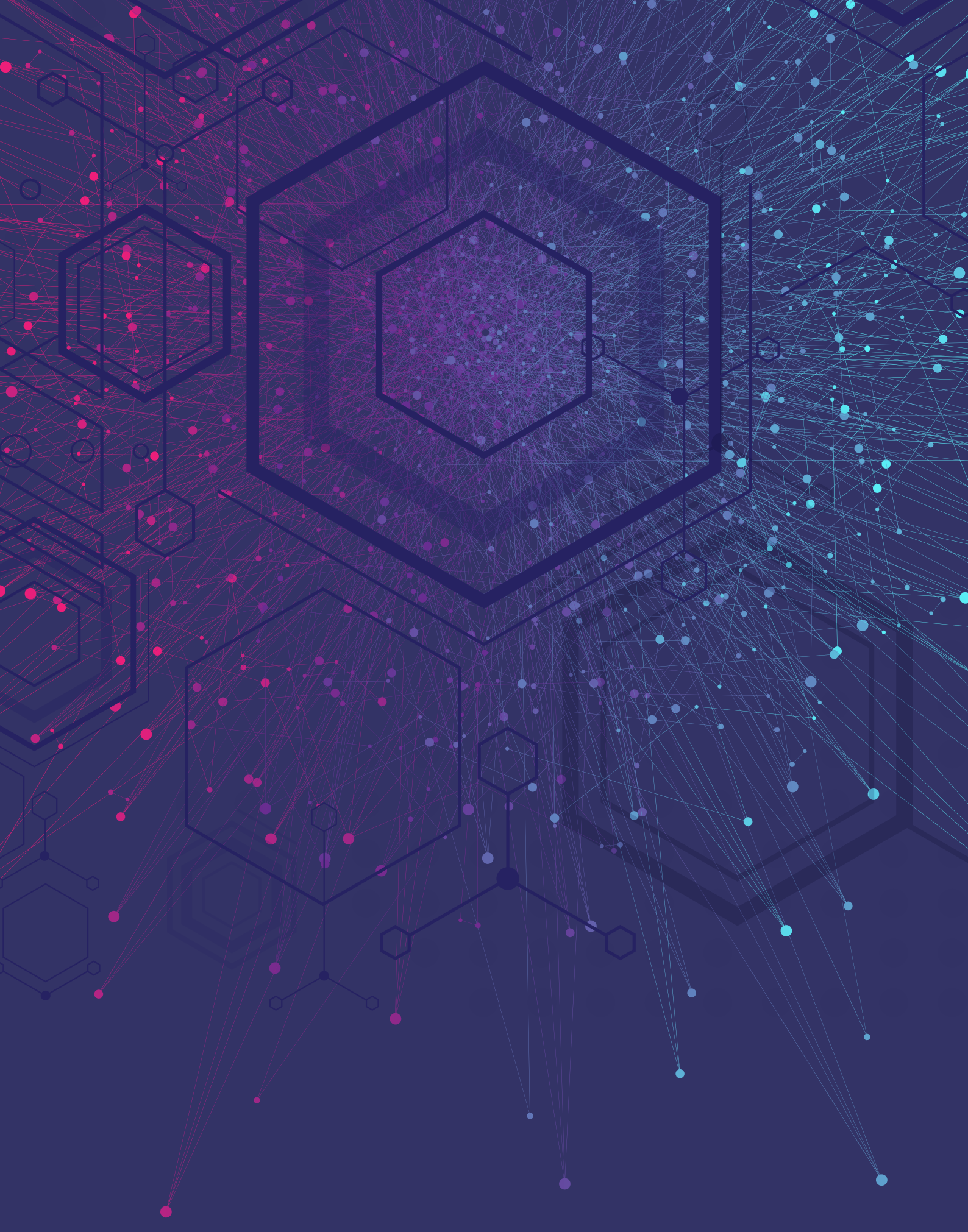


DESIGN AND MAKE ACTIVITY: THE TRAVELLING SPACE BUGGY

Have your ideas heard!

Now that you have discussed your ideas for Transport, collect the classes ideas using this [template](#) and email them to creatingourfuture@sfi.ie





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