

# SCIENCE WEEK

#scienceweek

7-14 Nov 2021

Supported by Science Foundation Ireland

# SUSTAINING OUR ENVIRONMENT

# ABOUT 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 our young people. All ideas will be captured and will help inform the future direction of research and innovation in Ireland.

Secondary school students are invited to take part in this national conversation on research. Research carried out in the present will have an impact on your future, and you have the opportunity to have your say on research that will help to make a better future for all in Ireland.

Some of us are excited to go back to exactly the way things were before the pandemic, others have found recent times to be a relief and want to keep the changes we've experienced, others want to hold on to some of the changes but not all of them. Our impact on the environment has improved in so many ways, such as air quality, and yet deteriorated in others, such as the use of single-use plastics. Remote working is the new norm for a significant number, this has directly impacted on quality of life in the positive and the negative for so many, for others it has resulted in a serious hit to livelihoods as footfall in office areas drop. Through all of this journey, the public has been largely united in turning to science for the data to inform decisions for today, and to bring hope for tomorrow.

Use these discussion toolkits in the weeks leading up to Science Week to debate and discuss STEM topics with your class that will affect our future, from changes in the fashion industry to using technology to enhance our cities and communities. During Science Week, submit your own idea to [creatingourfuture.ie](https://creatingourfuture.ie) to help researchers in Ireland to create a better future.

This toolkit provides background and discussion stimulus on Sustainable Mining. There are video and news sources linked throughout the document to help stimulate the conversation.

# INTRODUCTION AND BACKGROUND

## Sustainable Mining

### What are minerals and why do we need them?

Technically speaking, minerals are naturally occurring chemical compounds that have a specific crystal structure – they are the constituent parts of a rock. Let's break down what that means. If you think of a rock as a sentence, the minerals within the rock are like the words of that sentence. You can't have a sentence without words and you couldn't have a rock without minerals. Minerals are made up of elements, elements are like the letters that make up the word. Minerals are important to our society because of the elements, like metals, they contain.

Our society is reliant on technology, and as we try to create a sustainable future for our society, we need more and more green technologies. In turn, we can't build these technologies without their component parts – the metals. The thing is, if something doesn't grow on the Earth's surface, it has to be mined.

As the demand for technology rises, so too does the demand for the metals that are used to build the technology. This has a knock on effect on the amount of material we must mine to keep up with this demand. Increases in mining are a contentious issue, let's discuss this further below.



*Developed in collaboration with:*

**iCRAG**

# DISCUSSION STIMULUS



## Mining a Sustainable Future

This video addresses society's need for minerals and metals. When you watch the video, note the many different issues the presenters talk about. Do all of these issues apply to Ireland? How are researchers looking to solve these issues and can you think of any other things they could do?

## Mining in Ireland has key role in ensuring sustainable future

Among lots of other facts about mining and sustainability, this article mentions that "Europe is 75% dependent on imports for almost all metals and up to 100% for some critical minerals". Can you think of any problems that might come from this dependency?

[Read more](#)

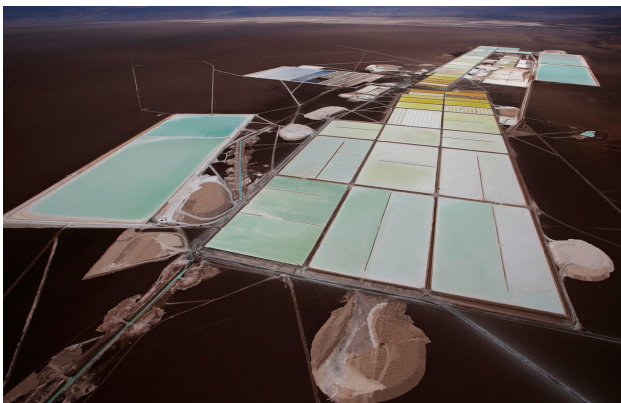




# Compare and Contrast

When reading an article, we must always consider the biases of that article – does the author want to show you a certain view point or do they show you a balanced opinion?

## The curse of ‘white oil’: electric vehicles’ dirty secret

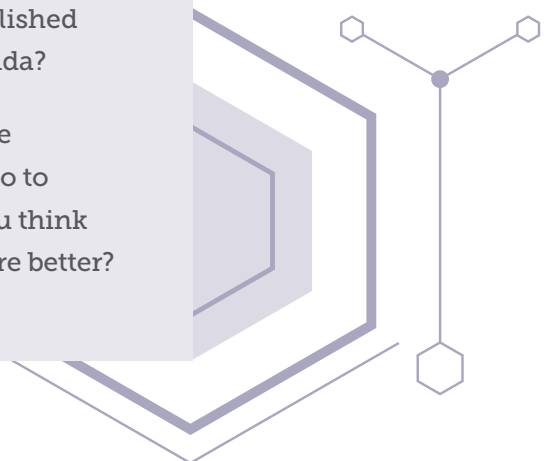
[Read more](#)

## Lisheen Mine: closure and rehabilitation

[Read more](#)

Is the first article biased and what are those biases? Who published the information for the second article? Do they have an agenda?

Do either of these articles make you think differently about the minerals we need for our sustainable future? What could we do to overcome the problems raised in this ‘white oil’ article? Do you think the Lisheen Mine could have done anything to make its closure better?



# Guiding Questions

## 1. Minerals and metals: how do we become more sustainable without increasing our consumption?

- a. Think about your personal recycling. Do you recycle everything you use?
- b. Do you contribute to the 'urban mine'? If you have old mobile phones, laptops and other tech that you don't use shut in a drawer somewhere then you just might! Do you think it will ever be possible to access the rare and important minerals and metals trapped in these items through recycling?
- c. Is it possible to recycle everything? You may wish to do some more research on this. If certain materials or metals that we need can't be recycled, what should we do? Does this raise any ethical issues?
- d. Knowing what you do about green technologies, like electric cars, would you still consider switching to this over non-green technology?

## 2. Mining, a necessary 'evil' or just a normal industry with bad PR?

- a. One of the articles you read claims that mining 'leaves a nasty scar on the landscape' and another gave you a real-life Irish example where a mine was responsibly closed. Can they both be true?
- b. Should we mine in Ireland?
- c. If we don't mine in Ireland, where do we get our metals from? (1) We will continue to need minerals and metals, in not mining for them in Ireland, do we force mining to occur in other parts of the world where environmental and safety regulations are not as strong? Is this ethical?
- d. If we don't mine in Ireland, where do we get our metals from? (2) you have found out that Europe is 75% reliant on imports for most metals, and 100% reliant on imports for some critical metals. By importing the resources we need to build green technologies, aren't we contributing more emissions and actually increasing climate change? Do you think this is a good reason to mine in Ireland or Europe?



# Additional Resources

[Miningasustainablefuture.org](http://Miningasustainablefuture.org) - Resource produced by iCRAG and the Natural History Museum for the Royal Society Summer Science Exhibition

Mining 'Energy Critical Elements' and making it sustainable – watch iCRAG and Natural History Museum research video

Read the Institute of Geologists of Ireland fact sheets on Minerals Information

iCRAG Geoscience Fact Sheets

Read the International Energy Authority article for a global view on sustainable and responsible development of minerals

Watch - Mining our way to a low carbon future Lucy Crane - Ted X



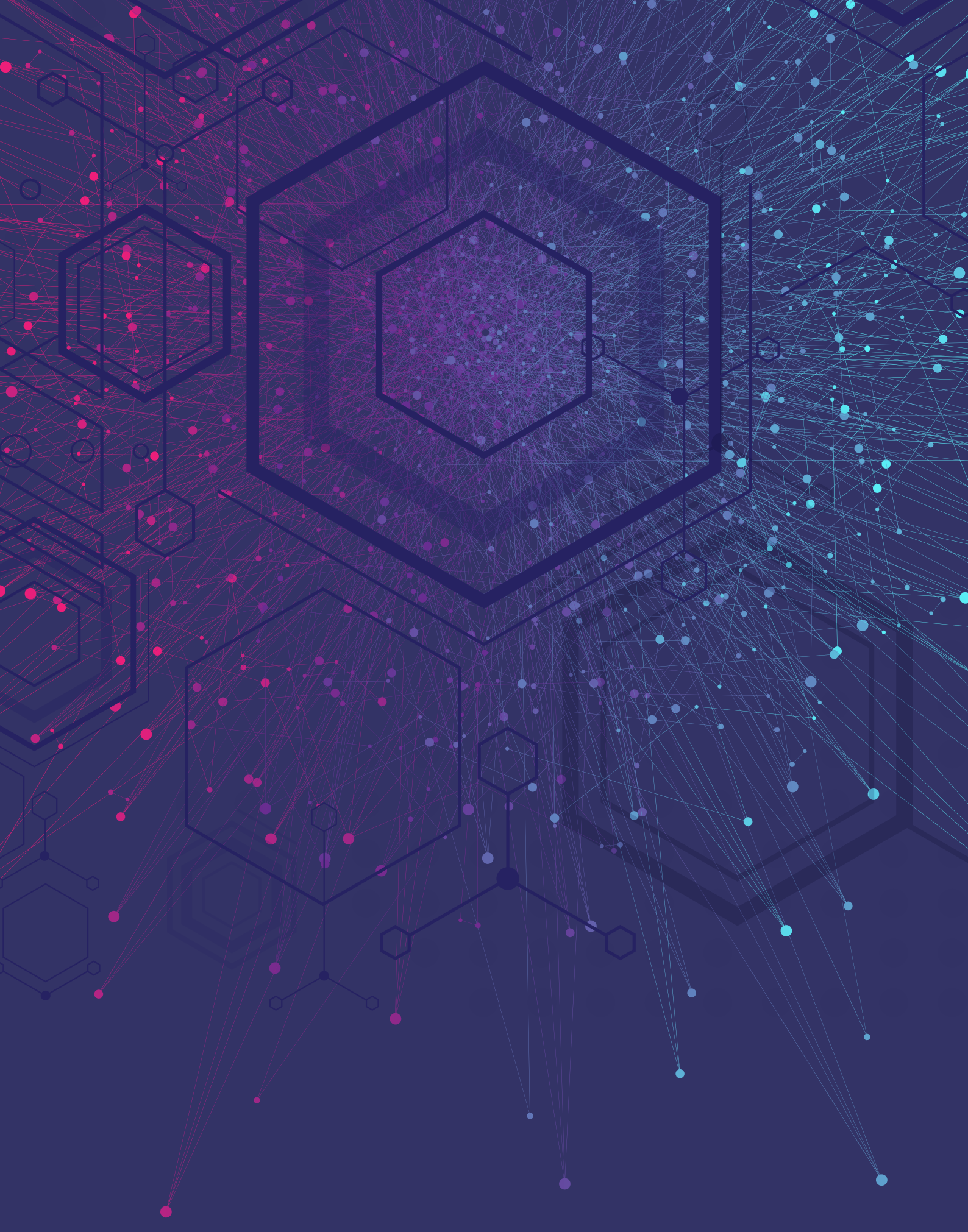
## Ireland's Biggest Brainstorm - have your ideas heard!

Now that you have discussed a Sustainable Future and heard about mining take five minutes to think of an opportunity or challenge you see for yourself, your community, Ireland or the world on this topic.

These can be captured in the classroom using this [template](#) and emailed to [creatingourfuture@sfi.ie](mailto:creatingourfuture@sfi.ie) or if you have access to a computer lab log onto to [creatingourfuture.ie](http://creatingourfuture.ie) and submit your idea directly on the website.







Science Foundation Ireland  
3 Park Place,  
Hatch Street Upper, Dublin 2.  
[scienceweek@sfi.ie](mailto:scienceweek@sfi.ie)

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

CREATING  
**OUR**  
FUTURE