

Mission: Protect our oceans

The Arctic Ocean guide



Mission: Protect our oceans offers a creative approach to learning about the oceans and issues that affect us all: the environment, the impacts of climate change, and our future. Developed with the Natural Sciences and Engineering Research Council of Canada (NSERC) in partnership with the Canadian Commission for the United Nations Educational, Scientific and Cultural Organization (CCUNESCO).

Students will be able to draw and submit their own inventions to appear on nserc.littleinventors.org, where they will be reviewed by the Little Inventors team, NSERC and CCUNESCO! Their idea might even be chosen as team favourite, turned into an animation or even made into a real object by one of our Magnificent Makers.

You can download the resources from nserc.littleinventors.org.

The resources have been designed to support scaffolded learning for students age 5 to 15 years old to stretch their imagination and creativity.

Use the notes in the presentation to deliver your workshop. You can choose the slides that you think are most appropriate to support your lesson, whether for elementary or secondary students. The notes are coded in regular font for content that is more accessible and **in bold for content that is more advanced**.



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Familiarize yourself with the resources available before the workshop

The Arctic Ocean

- Presentation
- 1x Time to reflect activity sheet per student

And of course don't forget to give your students invention sheets to capture their ingenious ideas!

Tools or materials needed during the workshop

Make sure you have plenty of black pens and colouring pens available for the workshop!

The Arctic Ocean presentation

This presentation focuses on the role of the Arctic Ocean and its importance in the fight against climate change, and presents slides accessible for elementary students, but also for secondary students. Go through the slides with your class:

- Slides 2 **'A world of ice'** introduces the geographical position of the Arctic ocean.
- Slide 3 **'Cool weather friend'** explores typical Arctic climate and why it is crucial to keeping the temperature of the planet down.
- Slide 4 **'White out'** explains that the whiteness of the ice acts as a shield to the ocean, stopping it from getting warmer.
- Slide 5 **'Temperature's rising'** explores how climate change is melting the ice and seeing temperatures rise much faster in the Arctic, a phenomenon known as Arctic amplification.
- Slide 6 **'Glaciers'** explains what they are and their place in the water cycle, and how they are a great indicator of climate change throughout the ages.
- Slide 7 **'Permafrost'** explains what permafrost is and how it is threatened to thaw by climate change, at the potential risks of land collapsing and release of methane and other greenhouse gases trapped underneath, which could fuel climate change further.
- Slide 8 **'Glimmers of hope'** looks at current solutions being explored by scientists to preserve the ice in the Arctic.
- Slide 9 **'Time to reflect'** supports the activity sheet of the same name, to encourage students to think about ways to stop ice from melting, for the sun to not reach the surface or keep the temperature down in the Arctic Ocean region.
- Slide 10 **'Coming up with ideas'** offers tips to get ideas flowing!

You can make this PowerPoint as interactive as you wish by asking your students questions throughout, such as:

- What do you know about the Arctic Ocean?
- What is the weather like in the Arctic?
- What are the land features in the Arctic?
- What are glaciers? What is permafrost?
- Why is ice so important?
- What causes climate change?
- Why do we need to look after our oceans?
- What could the future of the oceans look like?
- What would a happy ocean be like?



Then use the activity sheet 'Time to reflect' to think about ways to stop ice from melting, to stop the sun from reaching the surface, or keep the temperature down in the Arctic Ocean region.

Finish by getting them to think up and draw an invention that tackles the issue of climate change and submit it to the Mission: Protect our oceans challenge on nserc.littleinventors.org for a chance to see their invention being made real!

Customization: Focus on the weather in the Arctic and why it is important to the rest of the world.

Extended activity: You could ask students to research more information about the role of glaciers in the water cycle, or look at methane as a gas specifically.

You could also include a hands on activity on reaching the Arctic here

<https://letstalkscience.ca/educational-resources/stem-in-context/reaching-arctic>

Round-up!

After running the activity, gather all the student invention drawings in a gallery around the classroom/ workspace.

Get students to discuss their favourite ideas—what do they like and why? Encourage positive feedback throughout.

- What do they think of their invention?
- What are its strengths and weaknesses?
- How do they think their invention would work in real life?
- Can they imagine their invention being used by other people? What would they say?
- What other ideas or challenges can they think of?
- Why are inventions useful?
- How will they approach problems in the future?

Give students extra invention sheets to come up with more invention ideas at home. They can also download more invention sheets for free on nserc.littleinventors.org.

After the workshop: Make sure you collect all invention sheets during the workshop. Invention drawings should be scanned (rather than photographed) to be uploaded on nserc.littleinventors.org for a chance to get picked as Little Inventors team favourites, turned into animations or even get made into real objects!

With thanks to Let's Talk Science for contributing their expertise in bringing these resources together.

You can find useful learning strategies and further ocean related resources - <https://letstalkscience.ca/educational-resources/learning-strategies>.

<https://letstalkscience.ca/resources/search> (type "ocean" in the search box)

