



TARGET GROUP

STUDENTS 13-19

YEARS OLD

Content of TOOL-KIT

- PRESENTATION
- WEBINAR RECORDING
- DETAILED LESSON PLAN
- EXPERIMENT SCENARIO
- WORKSHEET FOR STUDENTS
- WORKSHEET WITH ANSWERS FOR TEACHER

GLOSSARY

- [Albedo](#)
- [Arctic](#)
- [Arctic amplification](#)
- [Climate](#)
- [Emission scenarios](#)
- [Greenhouse effect](#)
- [Greenhouse gas](#)
- [Permafrost](#)
- [Permafrost Carbon Cycle](#)
- [Sea ice](#)
- [Sea ice minimum](#)
- [Weather](#)

EDUCATIONAL TOOL-KIT

SYLLABUS

INTRODUCTION

The Arctic is changing rapidly. The warming trend in the Arctic is at least twice as large as the global average in recent decades. We call it **Arctic amplification** - the fact that temperature rise in polar regions is large in comparison to the temperature rise in lower latitudes and may further accelerate climate warming well beyond the Arctic. The loss of sea ice is one of the most cited reasons of Arctic amplification. When reflective ice melts, a darker ocean dominates. This amplifies the warming trend because the ocean surface absorbs more sun heat than the surface of snow and ice. Decrease in sea ice extent **reduces Earth's albedo** and accelerates the global warming.

The climate change accelerates also melting of glaciers, which causes sea level rise. Scientists estimate that due to melting of ice the sea level will increase **by 100 cm** by the end of the century.

Reduced snow cover on land affects boreal forests. They become more susceptible to drought, and consequently – to **fire**.

From decaying organic matter, trapped previously in **permafrost** and revealed due to thawing of permafrost, additional greenhouse gases are released to the atmosphere. It accelerates the temperature rise.

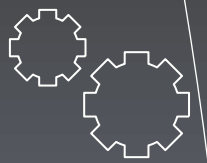
As the temperature in the Arctic is rising more rapidly than in the rest of the globe and the temperature on the Equator is increasing slowly, the differences between the North Pole and the Equator is decreasing. It slows down the **global circulation** and may affect the weather patterns far beyond the Arctic.

ARCTIC ISSUES: The changing Arctic



THINGS TO LEARN - 5 basic questions

1. What kind of feedback loops are effective in the Arctic?
2. How does the changing sea ice extent impact the albedo?
3. What is "Arctic amplification"?
4. What are the effects of thawing permafrost?
5. What are the main challenges that the Arctic faces due to climate change?



ADDITIONAL RESOURCES:

[INTERACT & BBC Arctic Climate Magnification \(video\)](#)

[INTERACT & BBC Extreme Causes For Concern \(video\)](#)

[TED-Ed animation: Why the Arctic Is a canary in a coal mine](#)

[National Snow and Ice Data Center](#)

[Interactive sea ice chart \(by NSIDC\)](#)

[Arctic sea ice 1984-2018 \(video\)](#)

[Fill in the Blanks Game: Arctic amplification](#)

