Polar Extremes

A Multimedia Adventure From Pole to Pole

Gina Varamo
NOVA / WGBH Boston

POLAR EXTREMES

Polar Extremes, a two-hour broadcast special hosted by Kirk Johnson, Sant Director of the Smithsonian National Museum of Natural History

Antarctic Extremes, a 10-part digital series hosted by NOVA reporters Caitlin Saks & Arlo Pérez

NOVA Polar Lab, a web-based experience that uses 360 videos, interviews with scientists, and mini-games


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In Partnership with PBS Digital Studios

NOVA LABS

Online games and research projects for teens — the scientists and informed citizens of tomorrow

With the NOVA Labs platform, we are creating 21st century digital resources that help kids to **learn by doing** and use real scientific data to solve problems.


WEDDELL SEAL PUPPING SITE
29
NOVA
SEAL WEIGHT Using Photogrammetry
So it will go from about the size of a second grader

NOVA Polar Lab Lesson Plan

Lesson Plan Grades: 6-12 Collection: NOVA Labs

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Overview Procedure Support Materials Standards

Explore the fascinating natural history of Earth's poles in NOVA's **Polar Lab**. First, students consider and discuss the types of evidence scientists use to reconstruct past environments. Students are then introduced to the natural cycle between "hot house" and "ice house" that Earth has experienced throughout its history. Next, students use claims, evidence, and reasoning in a discussion of what the evidence about the poles from Earth's past can tell us about its future. Discussion questions and video quizzes allow educators to assess student understanding.

NOVA

Credits

Lesson summary

The interactive NOVA Polar Lab uses 360° interactive environments, interviews with scientists, and mini-games to send students on an immersive quest to understand how the poles are key to understanding Earth's climate—past, present, and future. The Polar Lab, hosted by Caitlin Saks, is made up of three missions:

- **Mission 1, Ellesmere Island, Canada:** Students land in the Arctic tundra and are guided through this mission by paleontologists Jim Basinger and Jaelyn Eberle. Players encounter a 360° petrified forest environment and, through videos and interactive mini-games, must piece together fossils from ancient trees and animals to determine what this environment looked like 50 million years ago

You May Also Like

NOVA Polar Lab
Interactive

Evidence of a Warm Arctic Climate |...
Media Gallery

Antarctica's Ice-Free Past | Polar Extremes
Video

Adaptations to Changes in...

In This Collection: *Video (6), Lesson Plan (1), Document (1), Interactive (1), Media Gallery (2) for Grades 6-13+*

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NOVA: Polar Extremes

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Following a trail of strange fossils found in all the wrong places—beech trees in Antarctica, hippo-like mammals in the Arctic—the NOVA documentary, Polar Extremes, uncovers the sometimes bizarre climate history of the poles, from miles-thick ice sheets to warm polar forests teeming with life. What caused such dramatic changes at the ends of the Earth? And what can the past reveal about our planet's climate today?

In this collection, you'll also find resources with excerpts from Antarctic Extremes, a 10-part digital series that discovers what it takes to live, work, and do science at the bottom of the world. Finally, send students on an interactive quest in the NOVA Polar Lab, an immersive experience that uses 360° videos, interviews with scientists, and data-based mini-games to help students learn how Earth's climate has changed over deep time and recent history and how studying our past can help predict our climate's future.


EXTREMES


POLAR
EXTREMES

Celebrate Earth Day with Dr. Kirk Johnnson

NOVA Education was live.
about 3 weeks ago ·

Following

Join NOVA Education for an Earth Day conversation with Dr. Kirk Johnson, Sant Director of the Smithsonian's National Museum of Natural History and host of NOVA "Polar Extremes," to discuss why we study the Earth and what we can do to protect it.

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Frank Tellez · 7:31 Fossils are cool
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NOVA Education · 7:53 Submit your questions for Kirk in the comments!
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Marcus Rogers · 8:10 Was it scary to climb the whatever you climbed
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Amie Singh · 8:14 Thank you for this!
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WHAT'S INSIDE

POLAR EXTREMES

A Multimedia Adventure to the Poles of our Planet

Join NOVA for a multimedia experience that will take audiences back in time and across the globe to uncover the secrets of Earth's poles!

Join NOVA on a dramatic and surprising multimedia adventure from pole to pole and back in time with *Polar Extremes*, *Antarctic Extremes*, and the NOVA Polar Lab.

Hosted by renowned paleontologist Kirk Johnson, *Polar Extremes* is a two-hour special that takes viewers on an epic adventure through the last 650 million years to uncover the extraordinary climate history of Earth's poles. As Johnson travels the planet, uncovering clues of the polar past, NOVA's Caitlin Saks & Arlo Pérez explore the challenges of polar research today in *Antarctic Extremes*, a 10-part digital series that discovers what it takes to live, work, and do science at the bottom of the world. Classrooms can also experience the science of *Polar Extremes* first hand, with the NOVA Polar Lab, a web-based experience that uses 360° videos, interviews with scientists, and mini-games to send players on an immersive quest to understand how the poles are key to understanding Earth's climate—past, present, and future.

This multi-platform project brings the field of polar science to life for all kinds of learners through traditional storytelling and experiential, digital learning environments.

Join renowned paleontologist Kirk Johnson on an epic adventure through time at the polar extremes of our planet. Following a trail of strange fossils found in all the wrong places—beech trees in Antarctica, hippo-like mammals in the Arctic—Johnson uncovers the bizarre history of the poles, from miles-high ice sheets to warm polar forests teeming with life. What caused such dramatic changes at the ends of the Earth? And what controls the dial on Earth's thermostat? Today, the Arctic is warming faster than anywhere else in the world, and Antarctica has locked in its ice enough water to raise sea level by a terrifying 200 feet. The way that the poles respond to a warming climate is one of the greatest wildcards in predicting our climate future. Johnson uses Earth's history, written in stone, as a cipher to decode what is going on at our polar extremes today, and what the future may hold.

Stream the film on the NOVA website and learn more about the project:

pbs.org/polarextremes

Visit the *Polar Extremes* collection on PBS LearningMedia for free educational resources:

pbslearningmedia.org/collection/nova-polar-extremes

Polar Extremes Chapter Summaries

Below is a list of key sequences in *Polar Extremes* with timecodes for when those sequences begin in the film.

PART ONE: EARTH'S CLIMATE IN DEEP TIME

- 0:03:17 Arctic and Antarctic fossils reveal a warm polar landscape
- 0:29:42 Planetwide ice forms a "Snowball Earth"
- 0:34:20 Earth alternates between icehouse and hothouse climates
- 0:36:19 The carbon cycle dictates climate over deep time

PART TWO: THE ICEHOUSE OF THE LAST FEW MILLION YEARS & TODAY

- 0:49:27 Exploring the current icehouse
- 1:04:46 Earth's orbital cycles trigger the ice ages
- 1:12:48 Our poles today are starting to melt
- 1:21:10 Indigenous communities near the Arctic are feeling the effects of ice loss

PART THREE: EARTH'S CLIMATE FUTURE

- 1:26:17 Ice cores reveal CO_2 levels in ancient atmospheres
- 1:29:42 Visualizing current carbon emissions
- 1:32:48 Ancient shorelines forecast future sea level rise
- 1:36:48 Animals' evolutionary response to past climate change
- 1:44:03 Ice caves signal a looming tipping point for Earth's climate

Links & Contact Information

NOVA Polar Lab:
pbs.org/nova/labs

***Polar Extremes*:**
pbs.org/polarextremes

***Antarctic Extremes*:**
youtube.com/pbsterra

Polar Lab Collection:
pbslearningmedia.org/collection/polar-lab

***Polar Extremes* Collection:**
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novaeducation@wgbh.org

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