

What's Up with Climate Change? Learning Lab Teachers Guide (grades 6–8)

Preparing Before Your Upcoming Field Trip

Thank you for joining us for the “What’s Up with Climate Change?” field trip! Below are some resources to help prepare your students for our field trip together. This program will provide students with an opportunity to learn more about our atmosphere, climate change, impacts of climate change, and get them thinking about solutions.

Suggested Discussion Prompts Prior to Program

- What have you heard or learned about climate change?
- What is the difference between weather and climate?
- What are some changes to weather patterns and/or climate you have seen where you live? (e.g. It hasn’t snowed on Christmas in Denver in years)
- How does learning and/or talking about climate change make you feel?
 - Before sharing out with the full class consider having students share their responses with a partner, journal, and/or draw about their feelings.
 - If students are feeling distressed in any way, make a point to share that there are ways to take action (see below for climate mental health resources).

Optional Activity to Help Students Build Connection with the Environment Prior to Program

[Connecting with Special Places in Nature Activity](#)*

Learning Objectives:

- To identify emotions that students have for places in nature through drawing.
- To identify students’ everyday connections to nature.
- To help students build reciprocal relationships with natural places.

*Source: [CIRES Mental Health Support Activity Guide](#)

Resources to Introduce Climate Change Prior to Program

- [Why Earth is Warming](#) (UCAR Center for Science Education)
- [Why Does Climate Change?](#) (UCAR Center for Science Education)
- [The Climate System](#) (UCAR Center for Science Education)
- [Climate Basics for Kids](#) (Center for Climate and Energy Solutions)

Videos to Introduce Climate Change Prior to Program

- [“How Do Greenhouse Gases Actually Work”](#) [3 min] (MinuteEarth)
- [“What Does the Atmosphere Do?”](#) [11 min] (Crash Course Geography)
- [“Climate Change 101 with Bill Nye”](#) [4 min] (National Geographic)
- [“What is Climate Change”](#) [13 min] (Crash Course Geography)

Supplemental Activities & Resources

Dig Deeper and Keep Exploring After Your Field Trip!

Post Program Activities

1. Streams and Steam

[Streams and Steam Activity Guide](#)*

Learning Objectives:

- Students will predict how increasing temperatures on Earth will affect the water cycle.
- Students will synthesize information about the effects of climate change on the water cycle.
- Students will explain how changes in the water cycle affect humans.

Educational Standards:

- [MS-ESS2.A](#) Earth Materials and Systems
- [MS-ESS3.A](#) Natural Resources
- [MS-ESS3.C](#) Human Impacts on Earth Systems

*Source: USDA Southwest Climate Hub's *Climate Change and the Water Cycle* curriculum. The full 10-day curriculum can be found on the [USDA Southwest Climate Hub website](#).

2. Mitigation or Adaptation?

[Mitigation or Adaptation Activity Guide](#) (UCAR)

Learning Objectives:

- Students will consider the risks due to climate change.
- Students will learn to distinguish between mitigation and adaptation actions as climate solutions.
- Students will explore several current climate solutions.
- Students will make connections between their own ideas about climate actions and those that currently exist.

Educational Standards:

- [MS-ESS3-5](#). Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.
 - [MS-LS2-5](#). Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
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3. What's the Bigger Picture? Using the Power of Art to Teach Science

[What's the Bigger Picture Activity Guide](#) (*Shape of Life*)

[Artist Jill Pelto's website](#)

[Graphs for Student Assignment](#)

Learning Objectives:

- Students will consider issues that are associated with climate change.
- Students will consider the data scientists collect that provide evidence of climate change.
- Students will consider how climate change science can be communicated through art.

Educational Standards:

- [MS-LS2.A](#): Interdependent Relationships in Ecosystems
- [MS-LS2.C](#): Ecosystem Dynamics, Functioning and Resilience
- [MS-ESS2.D](#): Climate and Weather
- [MS-ESS3.C](#): Human Impacts on Earth Systems
- [MS-ESS3.D](#): Global Climate Change

4. Your Place in Focus

[Your Place in Focus Activity Guide](#) (*PBS*)

Learning Objectives:

- Students will explore and understand their local community, climate, and the changes impacting their local environment.
- Students will research and communicate all of the ways climate changes are affecting their community and produce a digital story that communicates what they've learned.

Educational Standards:

- [MS-ESS3.D](#): Global Climate Change
- [MS-ETS1.B.1](#): Developing Possible Solutions

5. Enough Energy? Play Renew-a-bead Game

[Renew-a-bead Game Activity Guide](#) (*Teach Engineering*)

Learning Objectives:

- Students will explore why an increased dependence on renewable energy sources is an inevitable part of our future.
- Students will be able to describe how the depletion of fossil fuels is a serious global issue.

Educational Standards:

- [MS-ESS3-4](#). Construct an argument supported by evidence for how increases in human population and per capita consumption of natural resources impact Earth's systems.
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CLIMATE RESOURCES

Resources for Teaching Climate Change

- [Guidance in Teaching About Climate and Energy](#) (*Climate Literacy and Energy Awareness Network*)
- [Your Guide to Talking with Kids of All Ages about Climate Change](#) (*NRDC*)
- [Climate Mental Health](#) (*Climate Literacy and Energy Awareness Network*)
- [What is Climate Grief](#) (*Climate and Mind*)
- [NOAA Climate Change Preliminary Reading Resources](#) (*National Oceanic and Atmospheric Administration*)

Online Resources

- [Impacts of Climate Change](#) (*UCAR Center for Science Education*)
- [Predictions of Future Global Climate](#) (*UCAR Center for Science Education*)
- [Future Climate: Explore the Possibilities](#) (*UCAR Center for Science Education*)
- [Sounding Climate](#) (*NCAR, UCAR Center for Science Education*)
- [18 Simple Things You Can Do About Climate Change](#) (*University of California, Davis*)
- [How to Save the Planet: A Kids' Guide](#) (*National Geographic Kids*)
- [Technologies that Reduce Greenhouse Gases](#) (*Environmental Protection Agency*)
- [Table of Solutions](#) (*Project Drawdown*)
- [Climate Solutions for All](#) (*Enacting Climate*)
- [Taking Action & Self Care Worksheets](#) (*Climate Mental Health Network*)
- [Climate Mental Health Support Activity Guide](#) (*Climate Mental Health Network, Climate Literacy and Energy Awareness Network, Cooperative Institute for Research in Environmental Sciences*)
 - [Nature Appreciation Activity](#)
 - [Climate Solutions Activity](#)
 - [You Are a Climate Leader Activity](#)
- [Climate Change and the Water Cycle](#) (*USDA Southwest Climate Hub*)
- [What Can We Do to Help?](#) (*NASA*)

Videos

- [Study Past Climate to Predict Future](#) [2 min] (*UCAR Center for Science Education*)
- [What Makes Cities So Hot?](#) [1 min] (*NCAR & UCAR Science Education*)
- [Sustainable Cities](#) [11 min] (*Crash Course Geography*)
- [The Engineering Challenges of Renewable Energy](#) [12 min] (*Crash Course Engineering*)
- [The Future of Clean Energy](#) [11 min] (*Crash Course Engineering*)
- [Earth Day 1970-2017: What's Changed?](#) [4 min] (*American Museum of Natural History*)