



Teaching with Sky Sci for Kids

**Learning resources for grades K-4 about
weather, climate, and things in the sky**

Where are you joining from? What grade do you teach?

Anchorage project: Land Acknowledgement

- land.codeforanchorage.org



About the UCAR Center for Science Education

- Develop K-12 learning resources
- Host school groups & the public at the NSF NCAR Mesa Lab (virtual options too!)
- Connect NSF NCAR & UCAR science to all learners

SciEd website: scied.ucar.edu





**A weather & climate
science website for
elementary learners**



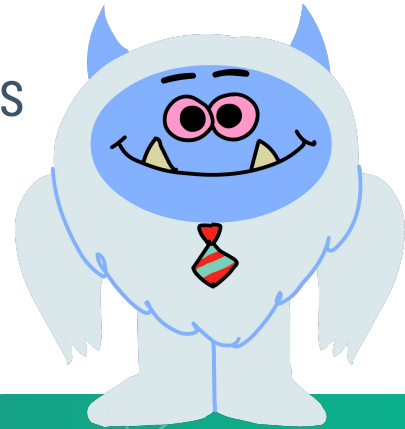
scied.ucar.edu/kids



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In today's workshop...

- In depth look at the SkySci for Kids learning resources
- Ideas for how to use SkySci to teach about weather, climate, and "stuff in the sky"
- Share SciEd resources



What SkySci topics do your students explore in K-4?

Stuff in the sky
Weather
Climate

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade +
ex: what is the weather like today	ex: objects in the sky (Sun)	ex: where water is found on Earth and in the atmosphere	ex: environmental change	ex: how natural hazards affect humans



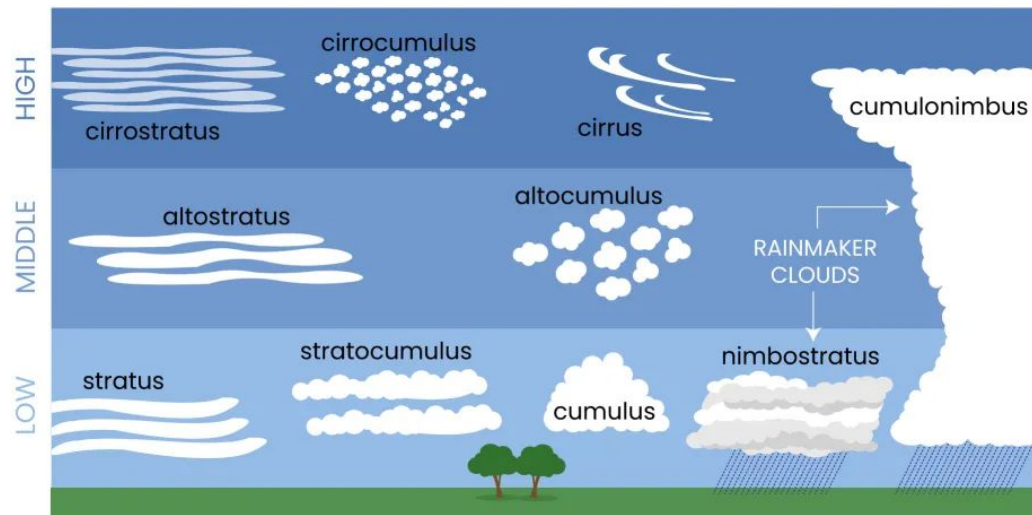
Clouds and Raindrops: things we can see!

Learn about clouds

- Questions about clouds, cloud names, types of clouds, how clouds form

Cloud activities

- Observe clouds outside ([cloud viewer](#))
- Make a model with cotton balls
- Video: [Making Clouds](#)
- Game: [In the Clouds with Mindy](#)



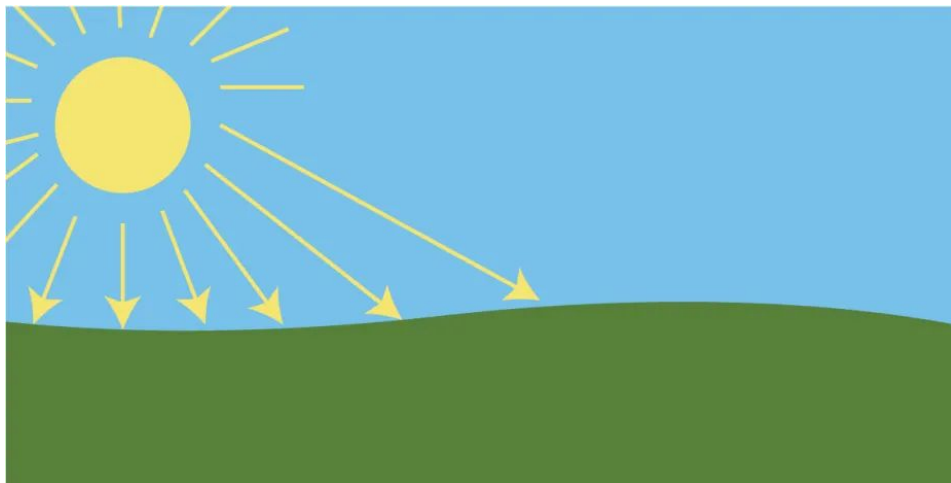
Sunshine & Heat

An introduction to [solar science](#)

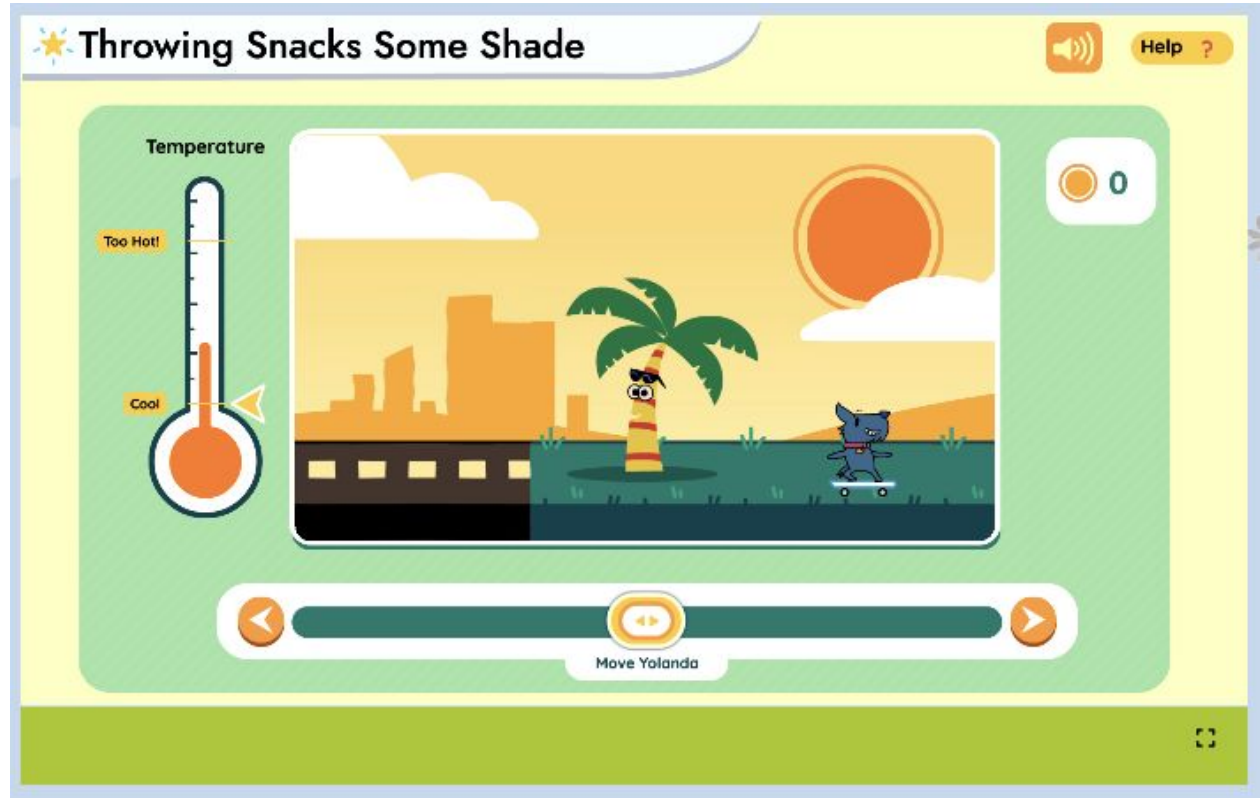
- Sunspots, animation of the Sun, How energy from the Sun warms the Earth, Rainbows

Sun Activities

- Light explorations with a Sun catcher
- Make a list/draw how to protect our bodies from the Sun
- Explore shadows



Web Game: Throwing Snacks Some Shade



The Earth is Getting Warmer...

Learn how heat affects us

- Heat in cities: An introduction to urban heat islands & actions to help, Heat Waves (video)

Heat activities

- Albedo experiments (dark surfaces are warmer than light surfaces)
- Cool Playgrounds Activity



Activity: Cool Playgrounds (part 1)



Cool Playgrounds

The Temperature Scavenger Hunt

Find an example of each surface below and measure its temperature in the sun and shade. If you find other types of surfaces, add them to the table and take their temperature too!

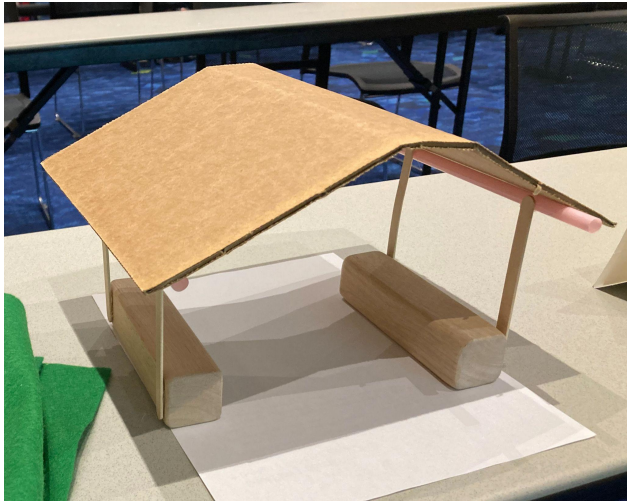
Type of surface	Temperature in the sunshine	Temperature in the shade
Pavement		
Grass or garden		
Mulch or soil		
Wood		
We found another surface:		
We found another surface:		

Visit the dark- and light-colored tiles and take their temperature. They are both in the sunshine.

Color	Temperature in the sunshine
The dark tile	
The light tile	

Activity: Cool Playgrounds (part 2)

Students apply what they've learned to design a shade structure to keep a playground cooler during hot summer days.



Cool Playgrounds

Design a Cool Playground

Version 1: Making a shade structure

- Draw what you want the playground shade structure to look like.
- Draw and label the types of ground surfaces you'd like to have in and around the playground to stay cool.
- Add a place in the shade where people can rest and a drinking fountain so that people get enough water when it's hot.



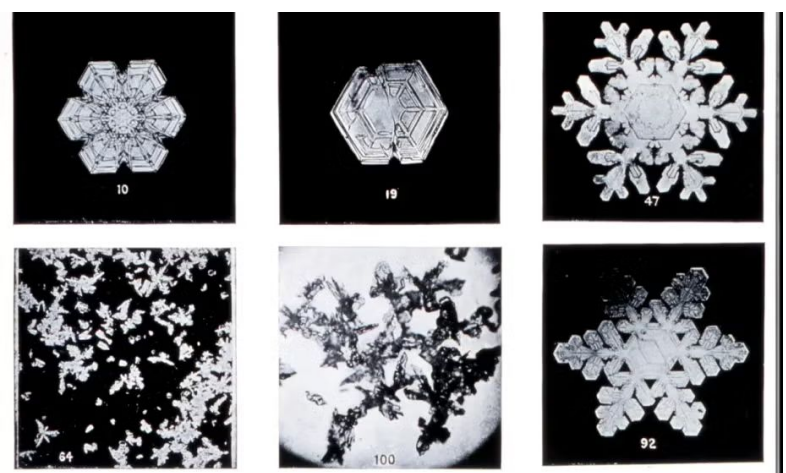
Weather Wonders

[Learn about weather:](#)

- Thunderstorms, snowstorms, hurricanes, safety, and more!

Weather activities:

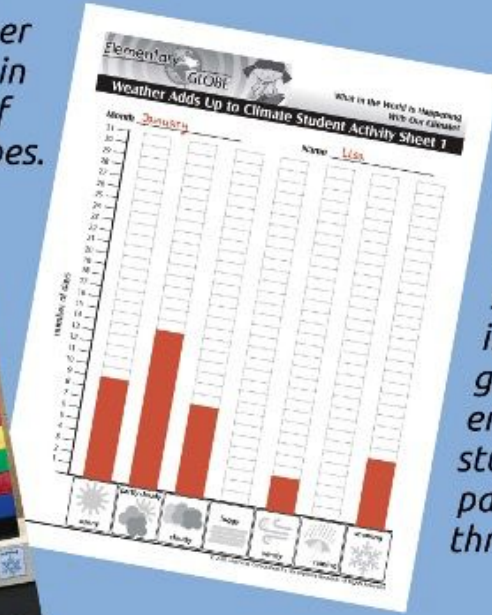
- Catching snowflakes on black paper
- [Weather Yeti](#)
- [Hurricane Allie Game](#)



Activity: Weather Adds Up to Climate

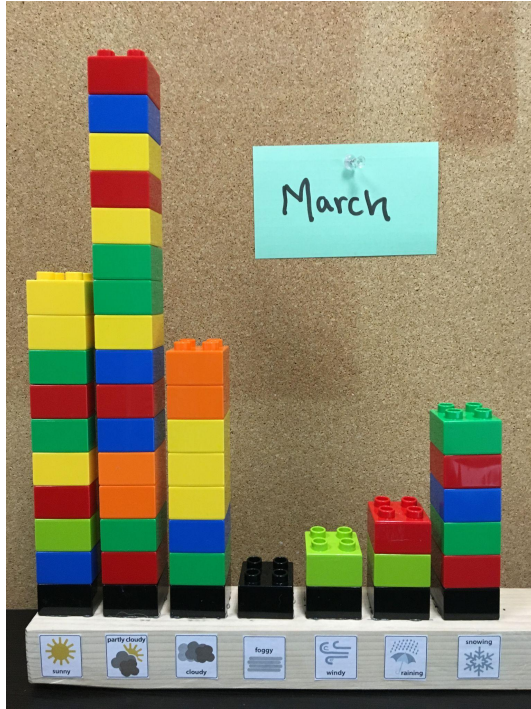
Class time: 3-5 minutes each day; time for data analysis at the end of each month

Students record weather observations each day in bar graphs made out of interlocking plastic cubes.

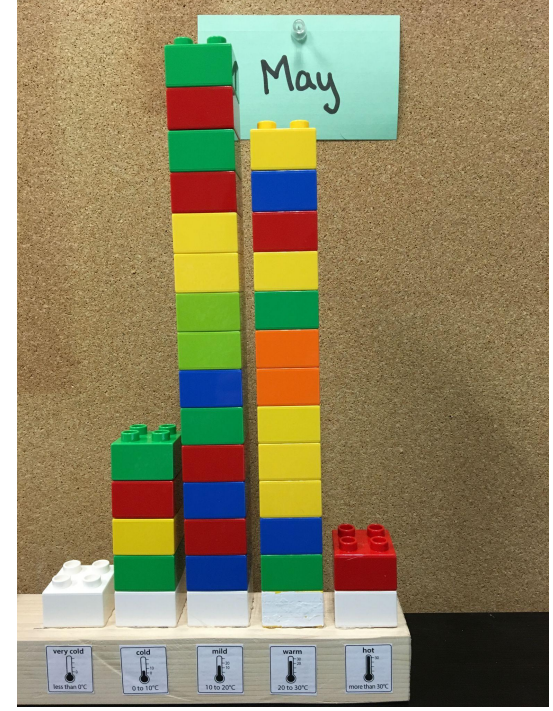
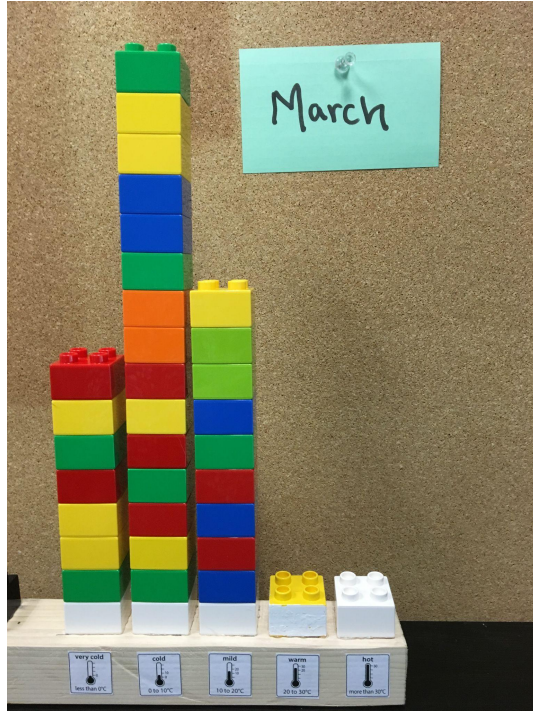


At the end of each month, students summarize the information in bar graphs. Then, at the end of the school year, students describe the patterns of weather through the year.

Activity: Weather Adds Up to Climate



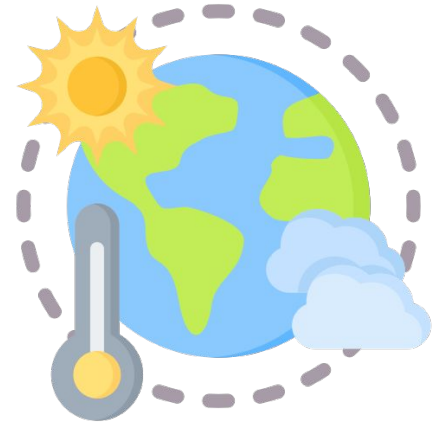
Activity: Weather Adds Up to Climate



Weather & Climate Basics

Weather changes day to day, hour to hour.

Climate is the average of 30 years of weather data.



*Climate is what you
expect.*

Weather is what you get.



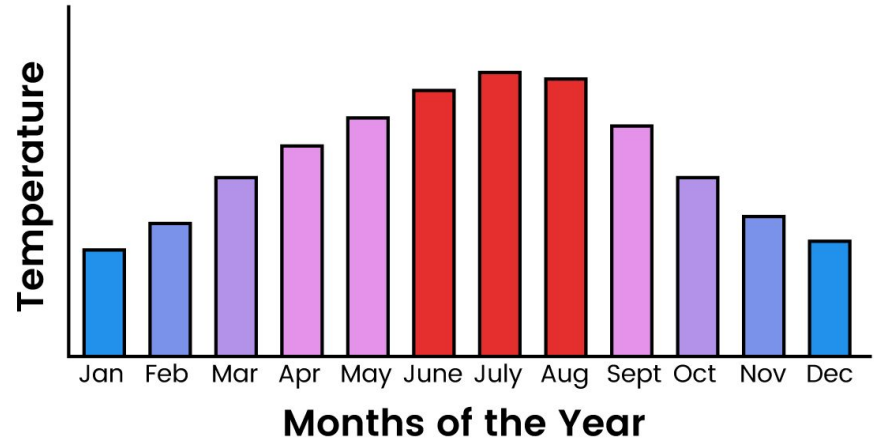
Climate Change

[Learn about climate change:](#)

- Weather vs climate, what is climate change, greenhouse gases, things that cause warming and things that slow warming

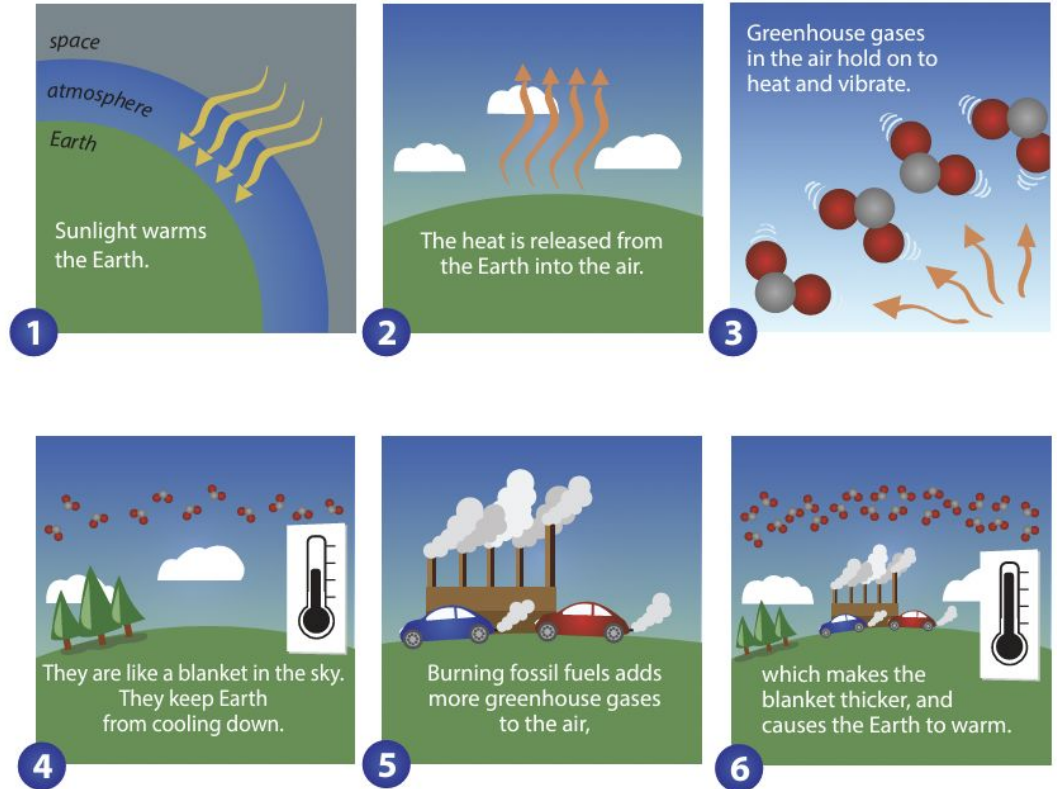
Climate change activities:

- Greenhouse Gas Acting Freezes
- Game: Help the Community





- How greenhouse gases trap heat
- How more greenhouse gases cause warming



Using **acting freezes** to help students learn vocabulary and the process of trapping heat in the atmosphere



Elementary GLOBE climate storybook



<https://www.globe.gov/web/elementary-globe/overview/climate>



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Web Game: Help The Community



Questions?
Thoughts?
Ideas?



Tell us what you thought of today's workshop...

Please complete this short survey:



A background image of a desk setup. In the foreground, a white laptop is partially visible on the right, showing its keyboard and trackpad. To the left of the laptop, a collection of sharpened colored pencils in various colors (blue, green, yellow, red, purple, etc.) are fanned out. Above the pencils, a silver metal clipboard with a black clip is holding a white sheet of paper. The paper has the text "Atmosphere Investigation" and "Surface Temperature Data Sheet" printed on it. In the top right corner, there are more papers, one of which has a date label that says "Tuesday". The overall scene suggests a workspace for scientific or educational work.

Additional Resources



CLEAN Guidance for teaching about climate & energy in elementary

- Teaching Strategies
- Elementary climate and NGSS
- CLEAN Webinar series



cleanet.org



Support Data-Literacy and Interpretation

This module will explore how to deal with the controversies surrounding climate change.



Encourage Action and Solutions-Centered Learning

This module will explore how to encourage concrete actions and solutions that students can personally implement in their communities.



Make It Personally Relevant and Culturally Sustaining

This module will explore how to bring in multiple perspectives, values, and ways of knowing about our climate.



Ground Students in Place-Based Learning

This module will explore how to use students' environments and communities as a critical context for increasing understanding of the climate.



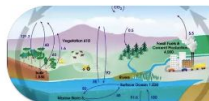
Keep It Experiential, Embodied, and Playful

This module will explore how to make learning about the climate nature-based, exploratory, fun, and hands-on.



Foster Empathy, Perspective, and Care-taking

This module explores how to use empathy to encourage young learners to care for their environment.



Teach It Across Disciplines

This module explores how climate science can be integrated into a variety of topics, such as math and reading, and how to use systems thinking from an early age.



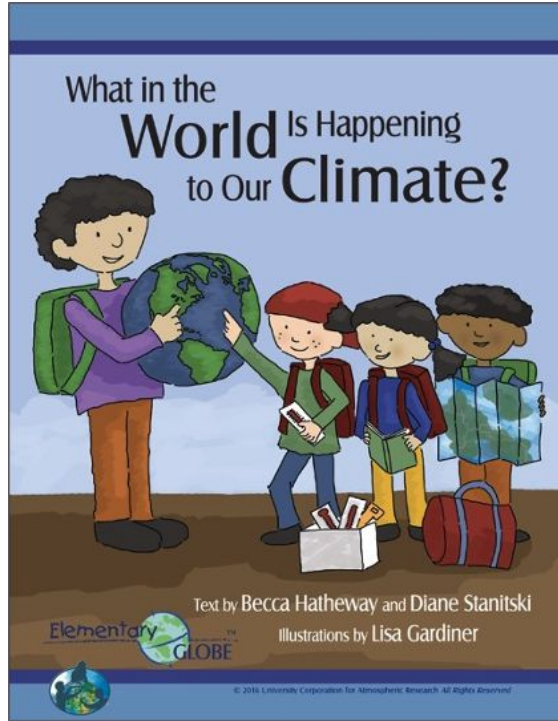
Grow Curiosity-Driven Science Practices

This module explores how to use students' interests to drive their learning, and how to ground their investigations in science practices.



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Elementary GLOBE storybooks



The kids in the storybook model NGSS Science & Engineering Practices:

- Asking Questions
- Planning and Carrying Out an Investigation
- Analyzing and Interpreting Data
- Developing and Using Models
- Obtaining, Evaluating, and Communicating Information

Teaching Resources



Find what you need to teach about weather, climate, and the Earth system, from quick demos to full curriculum.

scied.ucar.edu/educators/teaching-resources

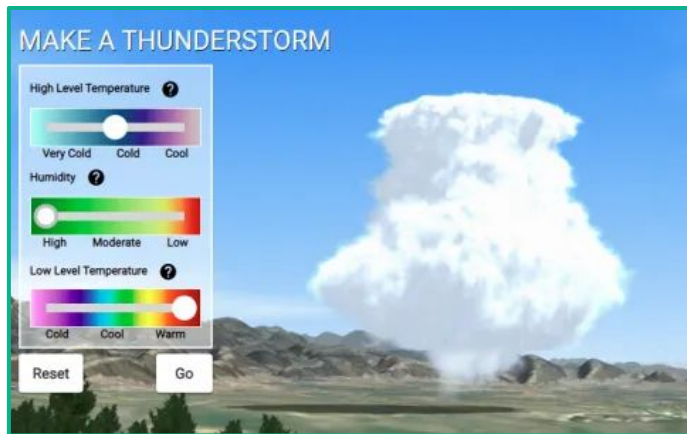


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The Learning Zone

A resource for public understanding of science and to support learning for secondary students

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What Is Air Quality?

When air quality is good, the air is clear and contains only small amounts of solid particle and chemical pollutants. Poor air quality, which contains high levels of pollutants, is often hazy and dangerous to health and the environment. Air quality is described according to the [Air Quality Index \(AQI\)](#), which is based on the concentration of pollutants present in the air at a particular location.



Air quality along the Front Range of the Rocky Mountains in Colorado is sometimes good (top) and sometimes poor (bottom). Often called "the brown cloud," poor air quality in this location is frequently caused by a thermal inversion, where cold air descending from the higher elevation mountains traps vehicle exhaust and pollutants near the surface, resulting in hazy conditions that are high in pollutants. (Stock Photo Partners (top image), Steven Knut (bottom image))

Why Does Air Quality Change?

Because air is always moving, air quality can change from day to day, or even from one hour to the next. For a specific location, the air quality is a direct result of both how air moves through the area and how people are influencing the air.

Humans Affect Air Quality

Geographic features such as mountain ranges, coastlines, and land modified by people can cause air pollutants to concentrate in, or disperse from, an area. However, the types and amounts of pollutants entering the air have a much larger impact on air quality. Natural sources, such as volcanic activity and dust storms, add some pollutants to the air, but most pollutants come from human activity. Vehicle exhaust, smoke from coal-burning power





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DEVELOPMENT

CLIMATE AND
THE EARTH SYSTEM
FOR K-12 EDUCATORS

ONLINE & IN-PERSON WORKSHOPS

Check our website for
upcoming Workshops!

[scied.ucar.edu/educators/
teacher-professional-devel
opment](https://scied.ucar.edu/educators/teacher-professional-development)



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