



## HANDS-ON SCIENCE ACTIVITIES



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### Activity 5

# Weather: The Many Faces of Mother Nature

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For use with participants ages 5 to 7



LUNAR AND  
PLANETARY  
INSTITUTE



ALA American  
Library  
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# *Discover Earth* Themes and Overview of Activities

The *Discover Earth* activities focus on Earth science topics close to home – such as local weather and the plants, animals, crops, and environmental features particular to your region – as well as a global view of our changing planet. Through hands-on investigations and discussions, young audiences discover that Earth’s global environment changes – and is changed by – the local environment. The activities explore three key messages relating to this overall theme: A. We belong to Earth; B. Each region is unique; and C. Your home is changing. These messages all relate to the overall theme: Earth’s global environment changes – and is changed by – the local environment. The activities were developed with guidelines set forth by the National Science Education Standards and American Association for the Advancement of Science (AAAS) benchmarks, and they were designed for audiences in the following four age ranges: 5 to 7, 8 to 9, 10 to 13, and teens.

## **Overall Theme**

Earth’s global environment changes – and is changed by – the local environment.

## **A. We Belong to Earth**

We belong to a complex system of interacting water, ice, air, and life.

### **Community Activities**

The community contributes to two exhibits: In *Century of Change Display*, the community gathers and compares photos and/or illustrations of the local areas taken a century and more ago with more contemporary photos of the same areas. In *Weather Wall*, children track the local weather over a period of two months or more, plotting weather data on a kid-friendly sticker chart.

### **Icebreaker Activities**

Children ages 5 and up are introduced to Earth’s major characteristics (or parts or systems) -- water, ice, air, and life – through the brief icebreaker activities *Catch!...the World’s Ocean*, *Ice-y Experience*, *Share the Air*, and *Web of Life*.

### **Discover Earth through Reading**

*I Belong to Earth* can serve either as part of a kick-off celebration or as an outreach program to area schools. Children and teens discover Earth science questions and answers using the library’s resources and participate in reading games — customized for ages 5 to 9, 10 to 13, and teens — that combine book lists and reading logs into take-home adventures! After this activity, the reading



games continue to connect patrons with the *Discover Earth* activities and resources. Participants advance by reading, engaging in suggested at-home activities, attending *Discover Earth* library programs, or investigating Earth and the environment through a variety of citizen science programs. Completed game boards may be submitted to the library for display, and if desired, entry into promotional drawings. Participants earn a decal upon completion.

## **B. Each Region Is Unique**

Changes to distant oceans, air moving freely around our globe, and all living things have an influence on our regional environment, now and in the past and future.

### **Weather Explorations**

Children ages 5 to 7 explore various aspects of weather through a series of stations featuring games, crafts, and weather observations in *Weather: The Many Faces of Mother Nature*. Children ages 8 to 9 and 10 to 13 undertake more advanced investigations of rain, wind, clouds, and weather instruments and consider how locally collected weather data relate to the broader Earth systems of water, ice, air, and life in *Weather Stations*.

### **Regional Explorations**

In *Climate Tour*, children ages 10 to 13 celebrate their region of the United States by creating a regionally-inspired postcard and recipe. Finally, they use a set of *What if...* cards about their region to reconsider their postcards and recipes in light of future climate change. In *Polar Bears or Penguins?*, children ages 10 to 13 use a fast-action matching game to demonstrate how each of Earth's polar regions is distinct and special.

## **C. Your Home Is Changing**

Earth's water, ice, air, and life will continue to interact over long-term scales, shaping the particular features of that place we each call home.

### **Environmental Stewardship**

In teams, children ages 11 to 13 build an understanding of how human actions impact global change by playing a board game, *Polar Bears Go with the Floes*, in which chance and choice determine the fate of a lone polar bear on an ice floe. Teens, ages 14 to 18, engage their communities in science through art in *Earth: Artistically Balanced*. The teens first interact with a climate scientist to unravel, on a very basic level, the complexities of Earth's climate system, and then they create a three-dimensional artistic representation of Earth's climate. The art may be created on a large scale and displayed at the library or made on a smaller scale to take home.



## How to Use These Activities in Your Programs

You may design your own program of one or more of these flexible activities, or you may choose to build the story of Earth and its changing environment through the complete series of activities! Background information and facilitator resources are provided to help you prepare to lead the activities. Encourage further exploration with the books, websites, and videos listed in the *Facilitator's Resources* packet. Programming ideas for all ages, infant to adult, are also provided.

Reading games, geared toward different age levels, support this module and connect the activities and resources. The games combine the traditional reading log and book list into a board game, where participants advance by reading, engaging in suggested at-home activities, attending library programs, or investigating Earth and the environment through a variety of citizen science programs. These games are introduced in Activity 4: *I Belong to Earth*. The game boards may be customized with your institutions' address, and if desired, an additional step in the instructions for winning prizes. Matching decals may be printed and awarded as prizes. *Read Me* bookmarks are available as a way for children to read, review, and recommend titles to others. These materials (shown below), including the supporting book lists, are available free for educational use at [www.lpi.usra.edu/explore/discoverEarth](http://www.lpi.usra.edu/explore/discoverEarth).





# Stations Setup Procedure

## Overview

Teams of children, ages 5 to 7, explore various aspects of weather through a series of stations featuring games, crafts, and weather observations. Allow 1 ½ hours for this activity. Alternatively, the activities can be undertaken one at a time with the entire group of children.

- Station 1: Cloud Watchers
- Station 2: Wind Streamer
- Station 3: Fastest Dresser
- Station 4: Climate Closet

Ideally, one of the icebreaker activities, *Catch!...the World's Oceans*, *Ice-y Experiences*, or *Share the Air*, is conducted immediately preceding this activity. Additionally, *Weather Wall* may be conducted before, during, and after this activity.

## Materials

Station materials are listed separately; materials required for combining the stations into an overarching experience are listed here.

## Facility Needs

- A large area where children can move around to visit stations
- 4 tables set up around the room
- 4 parents or older children to facilitate stations (if available)
- A large outdoor area or window where the children can gather to observe the weather
- Optional: Writing space viewable by the entire group, such as white board or poster paper and markers, or a black board and chalk

## For Each Group of 10 to 15 Children

- 1 set of signs printed on card stock and noting the following:
  - Station 1: Cloud Watchers
  - Station 2: Wind Streamer
  - Station 3: Fastest Dresser



- Station 4: Climate Closet

## For Each Child

- Optional: His/her *Discover Earth* reading game board

## For the Facilitator

- Facilitator's Resources* packet (available at [www.lpi.usra.edu/explore/discoverEarth](http://www.lpi.usra.edu/explore/discoverEarth)), which includes:
  - Background information
  - Be a Science Guide!*
  - Resource lists
  - Shopping list
- Optional: 1 bell
- Tape

## Preparation

- Review the *Facilitator's Resources* packet.
- The activity, as presented, includes a total of four stations and can be used comfortably with four groups of two to four children. Alter the number of stations as needed based on the number of children participating, providing duplicate stations, if necessary, so that there are enough sets of materials. (Alternatively, the games, crafts, and weather observations can be facilitator-led and undertaken sequentially by the entire audience.)
- If stations are set up, it is recommended that an adult or teen or older child be present at each station to serve as a host and to prompt the children's thinking. Station hosts may also demonstrate and/or assist younger children in completing the activity. Each activity has step-by-step instructions for the hosts.
- Use the shopping list to purchase or acquire materials.
- Prepare an area large enough for four stations, allowing enough room for groups of children to gather around each.
- Tape the signs so they hang from the fronts of the tables.
- Optional: Post a "vocabulary wall": white board or poster paper and markers, or a black board and chalk, to record terms that come up as they visit the stations.



## Stations Introduction

1. **Conduct one of the icebreaker activities, *Catch!...the World's Oceans, Ice-y Experiences*, or *Share the Air*, to set the stage for deeper explorations and a positive social experience.** Briefly highlight the library's resources and remind the children how they can use their participation in today's activity to advance on their "Discover Earth" games. Children who were not able to attend the activity *I Belong to Earth* will benefit from this orientation.
2. **Find out what children already know about weather:**
  - When we talk about weather, what kinds of things do we describe? *Temperature, whether or not there are a lot of clouds or if it is clear and sunny, whether the air is still or windy, and how much rain or snow is falling (if any).*
  - What is today's weather like?
  - What would be the opposite type of weather? What other kinds of weather are there?
  - How does the weather affect what you do every day?
  - Is today's weather "normal" for this season?
  - What do you think the weather will be like tomorrow and why?

**Facilitator's Note:** According to the American Geological Institute, this discussion is an important way to engage young children about weather:

Young children will have a working understanding of weather based upon their direct experiences with weather conditions. They will know that winds, clouds, rain, snow, heat and cooling are all involved with weather. However, they may have very little understanding of how these elements interact to produce weather systems. For them, it's concrete experiences that drive their understandings. Very young children see weather as isolated events. They think of it intuitively and momentarily when things happen that grab their attention. Connecting the different pieces to understand how one part can cause another, like clouds and rain, or clear skies and higher temperatures, comes later. Even then, children's ideas are likely to be limited to what they can actually observe. It's important to see the ideas children have as building blocks upon which they can develop a more scientific understanding of weather.

From the American Geological Institute's "Weather Unit," retrieved from [www.k5geosource.org/2activities/1invest/weather/index.html#wclk](http://www.k5geosource.org/2activities/1invest/weather/index.html#wclk) on July 27, 2011.



3. **Describe for the children how they are going to investigate their changing world by visiting four stations.** Divide the children into four teams (two to four children in each). Each team will visit all four stations. Allow approximately 15 minutes for each station and let the teams know when it is time to rotate (perhaps by ringing a bell). Have them follow the instructions for each station provided at the tables. While the children are working, the facilitator should visit the different stations to see if the children are having any difficulties. If there are assistants available, they should remain at their tables to help the children.
4. **After the children have finished at all the stations, invite them to share their explorations of weather.** Discuss each station separately:
  - What types of changes did you investigate?
  - What was the weather like today (Station 1: Cloud Watchers)? What did the clouds look like (if there were any)?
  - What kinds of weather would they like to observe at home? What tools did they construct for observing weather (Station 2: Wind Streamer)?
  - What types of weather changes did they experience at Station 3: Fastest Dresser?
  - What types of clothes do they keep in their closets to prepare for local winter weather (Station 4)?

## Conclusion

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**Summarize that weather is always changing!** Sometimes these changes are slow and hard to see, and sometimes they are fast, such as major changes in the daily high temperature or the onset of storms. Some changes take more time but may be easier to observe, such as the changing seasons. Each region usually has certain kinds of weather in each season and the people who live there keep certain types of clothing suitable for that weather.

Encourage the children to keep exploring the outdoors!

If possible, build on the children's knowledge by offering them a future program based on the *Discover Earth* programming ideas.



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# Station 1: Cloud Watchers

## Correlations to National Standards

### National Science Education Standards

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#### Grades K-4

Science as Inquiry – Content Standard A

*Understandings About Scientific Inquiry*

- Scientists use different kinds of investigations depending on the questions they are trying to answer. Types of investigations include describing objects.

Earth and Space Science - Content Standard D

*Objects in the Sky*

- The sun, moon, stars, clouds, birds, and airplanes all have properties, locations, and movements that can be observed and described.

*Changes in the Earth and Sky*

- Weather changes from day to day and over the seasons. Weather can be described by measurable quantities, such as temperature, wind direction and speed, and precipitation.



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# Station 1: Cloud Watchers

## Activity Procedure

### Overview

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Children identify the general shapes and colors of clouds, either through direct observations of clouds outdoors or by considering images of clouds. They compare the clouds' features to a cloud chart, which categorizes different cloud types.

### What's the Point?

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- Weather on Earth is always changing, but scientists — and children — can watch and note the general shapes and colors of clouds.

### Station Materials

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#### Facility Needs

- A large outdoor area or window where the children can gather to observe the weather

#### For Each Group of 10 to 15 Children

- Optional: computer, projector, and access to online images of clouds, such as at
  - Windows to the Universe Image Galleries (<http://www.windows2universe.org/php/gallery/gallery.php?id=11>)
  - Clouds in Art Interactive and Gallery ([http://www.windows2universe.org/art\\_and\\_music/cloud\\_art/cloud\\_art\\_main.html](http://www.windows2universe.org/art_and_music/cloud_art/cloud_art_main.html))
  - Gallery of Clouds (<http://scijinks.nasa.gov/clouds-gallery>)
- Optional: books and / or artwork that depict images of clouds

#### For Each Child

- Cloud Viewer* ([http://www.windows2universe.org/teacher\\_resources/cloud\\_viewer\\_web.pdf](http://www.windows2universe.org/teacher_resources/cloud_viewer_web.pdf)) preferably printed double-sided and in color
- Optional: 1 pair of safety scissors



- A weather journal, such as the Woodland Trust's "Weather Diary" ([www.naturedetectives.org.uk/download/weather\\_diary.htm](http://www.naturedetectives.org.uk/download/weather_diary.htm)) AND  1 pencil or pen

## For the Station Facilitator

- Be a Science Guide!* (available in the *Facilitator's Resources* packet at [www.lpi.usra.edu/explore/discoverEarth](http://www.lpi.usra.edu/explore/discoverEarth))

## Preparation

- Shortly before the children arrive, observe the weather outdoors. If using the *Cloud Viewer*, prepare to answer the children's questions by matching the visible cloud types to those shown on the *Cloud Viewer*.
- If there is inclement weather or no clouds in the sky, set up the computer, projector, and access to online images of clouds, or provide books and / or artwork that depict images of clouds, and conduct a modified version of the activity indoors.

**Facilitator's Note:** During this activity or any supplemental activities, avoid using cotton balls to represent clouds. Doing so may lead young children to the mistaken idea that clouds are made of a cotton-like substance.

## Activity

1. **Observe weather outdoors, if possible. Or, note the general conditions by looking out a window.**
  - What is the temperature like today? Is it hot, warm, or cool?
  - Is it raining?
  - Is it sunny or cloudy?
2. **Have the children describe the types of clouds they observe, if any are present.** Provide each child with a copy of a *Cloud Viewer*; if desired, provide them with scissors and instruct them to cut along the rectangle in the center to make a "window." If there are no clouds or it is not possible to go outdoors, display images of clouds online, at a computer station, or in books or artwork for the children to observe. Suggested websites are listed in the "Station Materials" section, and



additional related resources about weather are provided in the *Facilitator's Resources* packet.

- Do the clouds look bumpy or flat?
- Do they hang high or low in sky?
- What colors did you observe?
- Are the clouds grayer at their bottoms than at their tops, or are they all one (uniform) color?
- Has anyone flown in an airplane through a cloud? If so, what was it like?
- What are clouds made of?

The children may have many ideas, such as that they are made of smoke, cotton, or wool or that they are bags of water. Gently note that while some art projects and children's books depict clouds in these ways, they are not any of those things. Some children may suggest that clouds come from water vapor that comes from the Sun heating the oceans or from kettles. Elaborate that clouds are made of tiny drops of water or tiny ice crystals or a mixture of both.

**Facilitator's Note:** Clouds often appear white because the tiny water droplets or tiny ice crystals scatter light. Clouds may appear gray when they contain larger drops of water. Gently correct any ideas that the children may have about the different colors indicating different composition. The size of the water droplets or the reflection of sunlight makes clouds appear in different colors — at least on Earth. On other planets, clouds may be made of substances other than water and appear in different colors as a result.

- Do the clouds look like they have the same general shape and color as the photographs on your *Cloud Viewer* guides?
  - What might the clouds look like tomorrow? Do you think there will be the same general shape(s) of clouds as you saw today?
3. **Optional: Provide each child with a weather journal and a pen or pencil. Show them how to use their journals.** For instance, the Woodland Trust's "Weather Diary" has a row for each day of the week and columns for clouds as well as temperature, precipitation, etc. Show them how to write or draw the shapes and colors of clouds they observed.



## Station Conclusion

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**Invite the children to continue watching the sky for changes.** Invite them to record their observations — like a weather scientist (meteorologist) — in their journals over the next week!



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# Station 2: Wind Streamer Correlations to National Standards

## National Science Education Standards

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### Grades K-4

Earth and Space Science - Content Standard D

*Changes in the Earth and Sky*

- Weather changes from day to day and over the seasons. Weather can be described by measurable quantities, such as temperature, wind direction and speed, and precipitation.

Science and Technology – Content Standard E

*Understandings About Science and Technology*

- Tools help scientists make better observations, measurements, and equipment for investigations. They help scientists see, measure, and do things that they could not otherwise see, measure, and do.



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## Station 2: Wind Streamer Activity Procedure

Adapted from the Miami Museum of Science's Make a Wind Streamer, <http://www.miamisci.org/hurricane/windstreamer.html>.

### Overview

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Children create a wind streamer out of common materials and use it to determine the wind's direction.

### What's the Point?

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- Weather on Earth is always changing, but scientists — and children — can watch and note the different types of weather.
- Scientists use tools to measure wind direction (in addition to wind speed, temperature, and precipitation).

### Station Materials

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#### For Each Group of 10 to 15 Children

- 40-60 meters (45-66 yards) or more of crepe paper, in a variety of colors
- 10-15 (dinner-size) paper plates
- 5-8 copies of the *Wind Streamer Graphic and Instructions*, printed in color or in black and white and cut in half
- Craft supplies and tools, such as:
  - Rulers
  - Glue or tape
  - Crayons and / or colored pencils
  - Markers



## For Each Child

- Optional: A weather journal, such as the Woodland Trust's "Weather Diary" ([www.naturedetectives.org.uk/download/weather\\_diary.htm](http://www.naturedetectives.org.uk/download/weather_diary.htm))
- AND  1 pencil or pen

## For the Station Facilitator

- Be a Science Guide!* (available in the *Facilitator's Resources* packet at [www.lpi.usra.edu/explore/discoverEarth](http://www.lpi.usra.edu/explore/discoverEarth))
- 1 navigational compass

## Preparation

- Plan to provide verbal and / or written instructions for creating a wind streamer at this station.
- For young children, plan to provide assistance with gluing and cutting. Consider allowing extra time for this station for young children.
- Print color copies of the *Wind Streamer Graphic and Instructions* and cut them in half. Set them, along with the crepe paper, paper plates, and craft supplies and tools at the station.
- Create a wind streamer to serve as an example for the children to follow, then take it outdoors to prepare to answer the children's questions about using it. Use the navigational compass to identify the north from your location. Orient the wind streamer as described in step 3 and practice noting the direction of the wind. Place the example wind streamer at the station where everyone can access it.
- Plan to provide verbal and / or written instructions for creating a wind streamer at this station.
- For young children, plan to provide assistance with gluing and cutting. Consider allowing extra time for this station for young children.
- Print color copies of the *Wind Streamer Graphic and Instructions* and cut them into fourths. Set them, along with the crepe paper, paper plates, and craft supplies and tools at the station.
- Create a wind streamer to serve as an example for the children to follow, then take it outdoors to prepare to answer the children's questions about using it. Use the navigational compass to identify the north from your location. Orient the wind streamer as described in step 3 and practice noting the direction of the wind. Place the example wind streamer at the station where everyone can access it.
- If desired, expand this station to include other weather tools. Find instructions and materials lists at websites such as:



- *Rain Gauge*, National Wildlife Federation  
(<http://www.nwf.org/Kids/Your-Big-Backyard/Fun/Outdoors/Science/Rain-Gauge.aspx>)
- *Hear the Wind*, Miami Museum of Science  
(<http://www.miamisci.org/hurricane/windchime.html>)

## Activity

- 1. Discuss what weather the children experience at home and their ideas for how they might detect or measure it.**
  - What kinds of weather instruments have you seen at your home or in the community?
  - Does your family have a wind vane or wind chime at home? A thermometer? A rain gauge?
- 2. Explain that they will be making one kind of instrument, a wind streamer, for detecting the wind's direction.** Have the children follow these steps:
  - Color the wind graphic and cut it out along the black circle.
  - Prepare the plate, **starting with the bottom, flat side.**
    - a. Draw a large, straight cross through the center of the bottom side of the plate.
    - b. At each of the four ends of the cross, and about 1.5 cm (less than an inch) from the edge of the plate, cut a small hole.
    - c. Cut four crepe paper streamers, each measuring about 1 meter (or about the length of a child's outstretched arms) in length.
    - d. Thread each streamer through a different hole and tie it to the edge of the plate.
    - e. Note the cardinal directions (north, east, south, and west) by writing the capital letters N, E, S, and W next to the holes.
  - Glue or tape the colored wind graphic on the bottom of the plate, centered over the cross.



**Facilitator's Note:** The children may have ideas about what causes wind, including that clouds or trees cause the wind. For young children, it is important that they observe wind, rather than try to explain or model where it comes from.

Older children and parents may be interested in a deeper explanation. Wind is simply air molecules in motion. The Sun's light heats Earth's surface, and that heat is passed to air touching the ground. The warm air becomes less dense and rises. As cold air moves in to replace the rising air, we feel wind.

- 3. Demonstrate how the children will use their new tools at home!** Hold the example wind streamer horizontally in front of you, so that the plate is parallel to the ground. Grasp the edge of the plate near the letter "S" and turn to face north so that the "N" on the wind streamer is pointing to the north. Demonstrate that the wind will push the streamers toward one of the cardinal directions noted on the plate. Remind the children that they may have heard weather forecasters on television say that "the wind is blowing out of the north." Emphasize that a wind blowing *from* the north blows the crepe paper to the south.
- 4. Optional: Provide each child with a weather journal and a pen or pencil.** Show them how to use their journals. For instance, the Woodland Trust's "Weather Diary" has a row for each day of the week and columns for wind as well as temperature, precipitation, etc. Show them how to note the wind's direction.

## Station Conclusion

**Summarize that we can detect and measure the ever-changing weather with weather instruments.** Encourage the children to take their creations home with them and use them to note changes in weather over the course of a day, a week, or a season. Add that the wind streamer is not designed to be left outdoors. It should be stored indoors while the children are using it at home, and only taken outdoors for a few minutes each day to observe the wind's direction.



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# Station 3: Fastest Dresser

## Correlations to National Standards

### National Science Education Standards

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#### Grades K-4

Life Science - Content Standard C

*Organisms and Their Environments*

- Humans depend on their natural and constructed environments.

Earth and Space Science - Content Standard D

*Changes in the Earth and Sky*

- Weather changes from day to day and over the seasons.

### National Standards for Social Studies

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#### Early Grades

III. People, Places, and Environments

*School Applications*

- Have learners reflect upon elements in their environment and how we use and think about the physical and built environment. Stimulate learners' interest in things distant and unfamiliar and help lay the foundation for concern about the use and abuse of the physical environment.



## Station 3: Fastest Dresser Activity Procedure

### Overview

Children race the clock to prepare for a given day's weather! Using an almanac, a facilitator announces a type of weather that occurred in the area in the past. The children quickly dress in the clothing (such as "dress-up" clothes) and gear appropriate for that type of weather. This fast-paced game emphasizes that the daily routine of getting dressed is related to ever-changing weather outdoors.

### What's the Point?

- Weather on Earth is always changing, and we prepare for it on a daily basis by getting dressed.
- We observe changes in weather by keeping records of temperature and precipitation, which can be accessed in an almanac.
- A given location usually has certain kinds of weather in each season.

### Station Materials

#### For Each Group of 10 to 15 Children

- 4 sets of each of the following types of clothing and gear (clean "barely used" large items or "dress-up" clothes may be used):
  - Hot weather gear: Crocs™, sandals, flip-flops; swim clothes; Hawaiian grass skirts; t-shirts; shorts; wide-brimmed hats; sunglasses
  - Wet weather gear: galoshes; rain hats; umbrellas
  - Cold/snow weather gear: mittens or gloves; snow boots; earmuffs, snow hats; ski masks; snow suits

#### For the Station Facilitator

- Be a Science Guide!* (available in the *Facilitator's Resources* packet at [www.lpi.usra.edu/explore/discoverEarth](http://www.lpi.usra.edu/explore/discoverEarth))
- 1 almanac or access to online historical weather data for the nearest city
- 1 stopwatch



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## Preparation

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- Set out the materials. Arrange the clothing and gear (perhaps in the center of the area or spread out along one or more walls); ensure that all 10 to 15 children will have room to access them at once.

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## Activity

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1. **Reading a random selection from the almanac, the station facilitator announces a type of weather that the area experienced at some time in the past.** Children select from a variety of clothing and accessory options and dress themselves appropriately. The quickest dresser wins!
2. **Have the children repeat the process several times (at least once for each type of weather gear: hot, wet, cold/snow).** After each race, ask the following questions:
  - During what month do you usually dress like this? During what season?
  - What kinds of clothing do you think you will be wearing next month? In two months?
3. **Optional: Play another race where the children dress according to the forecasted weather for one of the next few days.** Specifically call out any major changes that are predicted, such as warm fronts, cold fronts, or storms.
4. **Optional: If you conducted the activity *Weather Wall*, remind the children of the local measurements that are being collected by the community.** Show them the data that have been/are being collected.

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## Station Conclusion

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**While some of us may very quick at getting dressed for the day, we all have to consider the day's weather when choosing our clothes.** Our community usually has certain kinds of weather in each season, and weather records, like those found in almanacs, show what the weather has been like in the past.



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# Station 4: Climate Closet

## Correlations to National Standards

### National Science Education Standards

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#### Grades K-4

Earth and Space Science - Content Standard D

*Changes in the Earth and Sky*

- Weather changes from day to day and over the seasons. Weather can be described by measurable quantities, such as temperature, wind direction and speed, and precipitation.

### American Association for the Advancement of Science Literacy Maps

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#### Grades K-2

Processes that Shape the Earth: Changes in the Earth's Surface

Some changes are so slow or so fast that they are hard to see.

### National Standards for Social Studies

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#### Early Grades

III. People, Places, and Environments

*School Applications*

- Stimulate learners' interest in things distant and unfamiliar and help lay the foundation for concern about the use and abuse of the physical environment.
- Have learners reflect upon elements in their environment and how we use and think about the physical and built environment. Stimulate learners' interest in things distant and unfamiliar and help lay the foundation for concern about the use and abuse of the physical environment.



# Station 4: Climate Closet Activity Procedure

## Overview

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Children consider examples of what kinds of clothes and gear are in their own closets and how that is a reflection of the region's typical weather (i.e., climate).

## What's the Point?

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- Our outdoor environment is constantly changing and these changes influence our daily lives.
- We prepare ourselves for our local outdoor environment by keeping certain kinds of clothing and gear in our closets.
- Children in other locations may experience an outdoor environment that is very different from the local environment.
- Each region usually has certain kinds of weather in each season and the people who live there keep clothing and gear suitable for that weather.

## Station Materials

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### For Each Group of 10 to 15 Children

- 1 set of *Dressed for My Winter Climate* sheets that show how a child might dress in each of the climate regions of the United States during winter:
  - Tropical: Warm, Wet Winters
  - Mountain: Cool or Cold Winters
  - Dry: Cool or Warm and Dry Winters
  - Continental: Cool or Cold and Wet Winters
  - Polar: Cold Winters
- 4 safety scissors
- Glue or tape
- Coloring supplies

### For Each Child

- 1 *My Climate Closet* activity sheet, printed double-sided
- 1 set of small pictures of clothing items, printed single-sided



## For the Station Facilitator

- Be a Science Guide!* (available in the *Facilitator's Resources* packet at [www.lpi.usra.edu/explore/discoverEarth](http://www.lpi.usra.edu/explore/discoverEarth))
- Climate map of the United States, such as at [HowStuffWorks.com](http://HowStuffWorks.com), which shows your climate region

## Preparation

- If desired, work with another library in a different region before the program to set up a “pen pal” relationship. Invite them to conduct this activity and send sets of “my climate closets” (photocopied or scanned from their participants’ original artwork) to your institution for display during your program. Upon completion of the program, send copies the children’s work in exchange.

**Facilitator’s Note:** Join the *STAR\_Net* Project's Community of Practice at <http://community.discoverexhibits.org/> and identify a “pen pal” library through the network there.

- Use a climate map of the United States to determine which of the following basic climate region designations best applies to your location:
  - Tropical: Warm, Wet Winters
  - Mountain: Cool or Cold Winters
  - Dry: Cool or Warm and Dry Winters
  - Continental: Cool or Cold and Wet Winters
  - Polar: Cold Winters
- Complete an example *My Climate Closet* activity sheet — perhaps with only one or two articles of clothing or gear affixed — to serve as an example for the children to follow. Place the example where everyone can access it.

## Activity

1. **Introduce to the children the idea that a person’s closet is filled with clothing and gear that reflects the weather that they *usually* experience.** (If the children are able to master a new term, introduce this concept as “climate.”)
  - What is our weather *usually* like in winter? Is it cold, cool, or warm? Does it rain or snow a lot, or is it usually dry? Do we usually have rain, or just snow? Do we usually have snow, or just rain?



- 2. Discuss how the people living far away may usually have different weather in the winter than we do.** Note that the community and the area surrounding it are what we call a “region.” Tell the children what climate region they are living in:
  - Tropical: Warm, Wet Winters
  - Mountain: Cool or Cold Winters
  - Dry: Cool or Warm and Dry Winters
  - Continental: Cool or Cold and Wet Winters
  - Polar: Cold Winters

Ask the children to describe what another 5-, 6-, or 7-year-old in a distant region might have in his or her closet. Show the *Dressed for My Winter Climate* sheets and discuss why certain footwear, hats, and clothes are appropriate for the usual winter weather in other regions. Note that while many children have t-shirts, shorts, swim suits, and other warm-weather clothing in their closets in summer, many regions have very different weather to prepare for in winter. For example, many children may have to prepare for snow, while others never see snow, but dress for cool and rainy weather — or even warm weather! — in winter.

**Facilitator’s Note:** Earth’s systems interact to create the *usual* weather and make each region special. A region’s climate is determined mainly by its latitude and altitude (and influenced by the area’s landscape, e.g. nearby mountains, oceans, and lakes). However, it is also shaped by global, rather than regional, influences: ocean currents, patterns of air flow, and cloud formation.

While weather can change in a matter of hours or with the seasons, climate is the long-term average weather of a region. Climate is the average of 30 years or more of weather in a region, i.e. the region’s “typical” weather.

Different clothing and gear are suitable for your local climate. For example, the children in northern regions or higher altitudes may only occasionally have the opportunity to wear warm-weather clothes and shoes (and they may choose to wear them even in cold weather!). They probably do, however, have heavy jackets and hats and mittens. Those in warm, mild climates may not own snow boots, but may have umbrellas. Children in arid regions may not even own galoshes and umbrellas.

*Weather* is what helped you decide what to wear today. *Climate* determines what you’re likely to find in your closet.

- 3. Invite the children to create their own climate closet!** Have them color and cut out pictures of items they might have in their closets: snow boots, parkas, shorts, etc. and paste these in 8.5”x11 “closet” templates.



## Station Conclusion

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**Summarize that each region usually has certain kinds of weather in winter, as well as in each of the seasons.** We keep up with our local ever-changing environment by keeping certain types of clothing and gear in our closets.



## Contact Information

Your questions and comments about the *Discover Earth: Hands-on Science Activities* are welcome!

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## *STAR\_Net* Project Overview

The *STAR Library Education Network* project (*STAR\_Net* for short) is part of a national initiative to support libraries that are already providing informal STEM learning, or want to provide it. The *STAR\_Net* project has a number of components, including:

- Two traveling exhibits for libraries: *Discover Earth: A Century of Change*, and *Discover Tech: Engineers Make a World of Difference*.
- An Education Program, which includes developing exemplary hands-on activities for libraries, as well as conducting training (both online and in-person) for library staff.
- An Outreach Program that helps libraries to develop STEM programming and find local partners for collaborations on programming.
- An online Community of Practice (CoP) (<http://community.discoverexhibits.org>) for librarians (both hosts and non-hosts of the exhibits) and STEM professionals who want to support STEM programming in public libraries.

The National Science Foundation (NSF) provided funding the *STAR\_Net* project. *STAR\_Net* is led by the National Center for Interactive Learning (NCIL) at the Space Science Institute. Dr. Paul Dusenbery is the project director. STAR stands for “Science-Technology Activities and Resources.” In addition to NCIL staff, the project team includes:

- The American Library Association (ALA), which is managing the exhibit tours and helping to raise awareness among librarians of the many opportunities for providing STEM programming



- The Lunar and Planetary Institute (LPI), which is leading the Education Program component. For some years, LPI has led the *Explore* program for libraries, which has been at the forefront of developing STEM programming and training for librarians.
- The National Girls Collaborative Project (NGCP), which is leading the project's Outreach Program. As a project partner, this NSF-funded project is helping libraries across the country partner with a variety of organizations to provide STEM programming.
- NCIL's Kate Haley Goldman and staff from Evaluation and Research Associates are conducting evaluations of the project's components. The project also includes a research component that explores how public libraries can serve as STEM learning centers in rural, under-served communities. The evaluation and research results will be shared with the informal science education community.

The activity described in this packet was developed for libraries to use in support of the *Discover Earth* traveling exhibit, though it may be implemented independently.

## Online Community

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Librarians, scientists, engineers, educators, museum staff, and others are invited to join the *STAR\_Net* online community! The website fosters collaboration among professionals who want to provide or support Science, Technology, Engineering, and Mathematics (STEM) learning experiences in libraries. The *STAR\_Net* project team hopes you find the following activity useful. Please join the online community (<http://community.discoverexhibits.org>) and share your experiences implementing it with your colleagues.

For more information about the *STAR\_Net* project, please contact:

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## **Development Team (Lunar and Planetary Institute, Houston, TX)**

*Discover Earth: Hands-on Science Activities* was developed by the Lunar and Planetary Institute's *Explore* program team in support of the *Discover Earth* travelling exhibition by the Space Science Institute's National Center for Interactive Learning ([www.DiscoverExhibits.org](http://www.DiscoverExhibits.org)).

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## **Field Tests**

Appreciation is extended to the librarians who field tested the materials in their children's, youth, and teen programs.

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# Appendix: Activity Materials to Print

# **Station 1: Cloud Watchers**

# Station 2: Weather Crafts

# **Station 3:**

# **Fastest**

# **Dresser**

# **Station 4: Climate Closet**

# Wind Streamer



## Measure the Wind's Direction!

1. Go outside on a breezy day.
2. Hold the wind streamer out flat in front of you.
3. Hold the edge of the plate near the letter "S" and turn to face north so that the "N" on the wind streamer is pointing to the north.
4. Watch the wind push the streamers! Note the cardinal direction that is opposite the direction that the streamers are pointing. For example, a wind blowing *from* the north blows the streamers to the south.

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## **Tropical: Warm, Wet Winters**

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## **Mountain: Cool or Cold Winters**

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## **Dry: Cool or Warm and Dry Winters**

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## **Continental: Cool or Cold and Wet Winters**

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Credit: Heather Dalton Photography

# Polar: Cold Winters

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# My Climate Closet

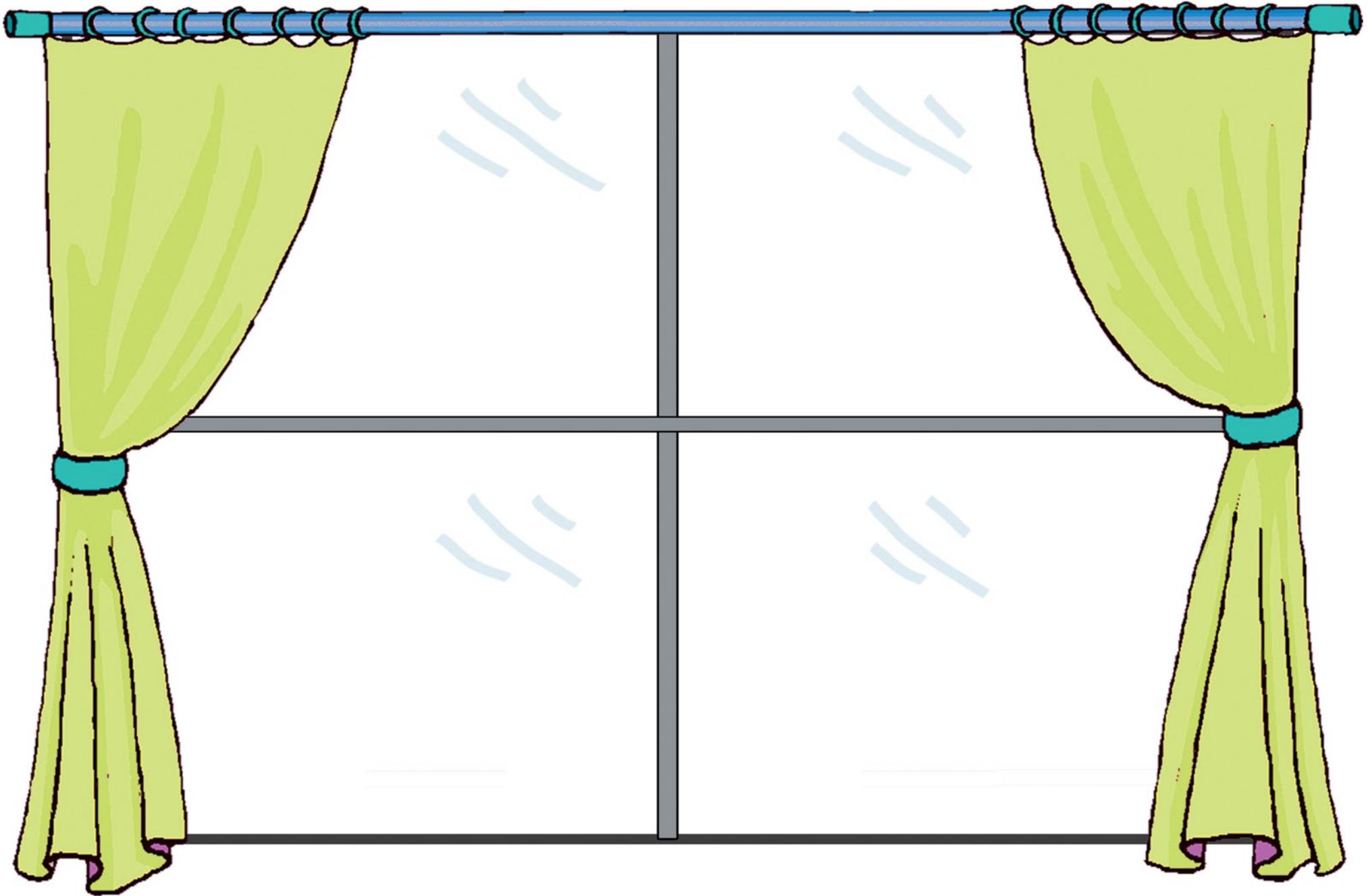


What do you have  
in your closet  
in winter?

Color, cut out,  
and tape or glue  
pictures of winter  
clothing and gear  
inside the closet.

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First name



What's the winter weather usually like where you live?  
Draw what it's like outside your window at home!

