

Kindergarten: Earth and Space Science

WHAT'S THE WEATHER?: Patterns

Background Information

Students in kindergarten develop the understandings of basic needs, weather patterns and severe weather. Through identification of patterns, determination of cause and effect, investigation of structure and function, as well as systems and system models students begin to make sense of the natural world. Developmentally appropriate use of science and engineering practices prepares students for more complex phenomenon. December through February comprise the winter season in the Northern hemisphere. Changes in temperatures, forms of precipitation, types of storms, and preparedness plans occur during winter. Average daily temperatures in the Chicago area range from a high of 36°F to 18°F as a low, while precipitation (rain or the equivalent of snow/ice) ranges from 1.93 inches to 2.56 inches. These are average conditions for the winter season but there are many winter hazards that cause big impacts. Students can play a big role in preparing for winter events.

Performance Expectations

K-ESS2-1 Earth's Systems

Use and share observations of local weather conditions to describe patterns over time.

<https://www.nextgenscience.org/pe/k-ess2-1-earths-systems>

K-ESS3-2 Earth and Human Activity

Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.

<https://www.nextgenscience.org/pe/k-ess3-2-earth-and-human-activity>

Disciplinary Core Ideas

ESS2.D: Weather and Climate

Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time.

ESS3.B: Natural Hazards

Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events.

Science and Engineering Practices

Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. Use observations (firsthand or from media)

to describe patterns in the natural world in order to answer scientific questions. Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information. Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world.

Crosscutting Concepts

Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.

Cause and Effect: Events have causes that generate observable patterns.

Interdependence of Science, Engineering, and Technology: People encounter questions about the natural world every day.

Influence of Engineering, Technology, and Science on Society and the Natural World: People depend on various technologies in their lives; human life would be very different without technology.

Objectives

- Students will record daily weather, which includes sunny, cloudy, precipitation, and relative temperature.
- Students will tally the number of days for each type of weather.
- Students will use collected data to determine and predict weather patterns.
- Students will work collaboratively to research information needed to develop a forecast.
- Students will present forecasts to the class.
- Students will develop an understanding of the importance of forecasting.

Materials

- Teacher Set of Numbers
- *My Weekly Weather Chart* Student Page
- *Monthly Weather* Student Page
- Set of Weather symbols
- Newspaper Forecasts (optional)
- Computer with Internet Access (optional)
- Pocket Chart (optional)
- Coloring Supplies (optional)
- Glue Stick (optional)
- Sight Words (optional)

Note: You may wish to have sight words available for pasting into, “The weather this week was,” portion of the My Weekly Weather Chart Student Page.

Advanced Preparation

- Determine how the class will collect the data to chart. Will this be part of the beginning of each day?
- Determine the size of the forecast group. Individual? Groups of 2? 3? 4?
- Determine the frequency of forecasts.
- Decide the presentation format.

Suggested Approach Part I: Daily Weather

Each student will have their own weather chart. Continue to use the weekly weather chart to collect and record daily weather data, as well as discuss observations. At the end of the each week and each month, analyze data looking for patterns.

Some websites for students include <https://kidsweatherreport.com/>, <https://weather.com/weather/tenday/1/Kids+Place+A9704258:17:US>, and <https://www.weather.gov/cae/justforkids.html>.

Debrief

The following prompts may be helpful for weather discussions. Encourage students to justify their decisions.

- *What type of weather did we have this week?*
- *Was the weather the same each day? Use your weather chart to help make your decision.*
- *Was the weather different each day?*
- *What do you think the weather will be (tomorrow, next week)? Why do you think this?*

Suggested Approach Part 2: Student Forecasts

A forecast is to make a prediction, something often done in science. Analyzing patterns seen in daily weather, as well as over the years, is used to make forecasts. Students should refer back to their daily weather data in developing their forecasts.

Assist students as needed as they complete their forecast notes on the *What's the Weather* student page. You may wish to have students do some research to help them prepare their forecasts. You can determine if the students will be making a forecast for the next day, the next week, or the coming month. Upon completion of their forecasts, student groups present their work to the class.

Using the following prompts may help students to connect the usefulness of forecasting:

- *Will you wear a thick coat or just a jacket?*
- *Will you have to cover exposed skin (hat, gloves, and scarf)?*
- *Will you need thick boots? Waterproof boots? Boots with a good tread?*
- *Will it be too slippery to go down the front steps without holding the railing?*

- Is it safe to wait for the bus in the same place/manner that you usually do?
- Can you walk your normal path to school or will there be obstacles to go around?
- Is the snow very deep?
- Why is it important to know what the winter weather will be? Note: Change the above questions as needed to reflect each season.

Resources

Book suggestions from : <http://www.kbs.msu.edu/wp-content/uploads/2017/02/NGSS-Interactive-Read-Alouds.pdf>

- Kaner, E. (2007). *Who likes the rain? (Exploring the elements)*. Characters observe the rain and share why they like it. Includes fold-out pages that give more information on the science of rain. This book is one of four in the Exploring the Elements series. Series also includes books on wind, snow, and sun.
- Hutchins, P. (1993). *The wind blew*. A fun, rhyming book about villagers reacting to a giant windstorm.
- Shannon, D. (2000). *The rain came down*. Animals and humans alike react to the rain.
- Asch, F. (2008). *Like a windy day*. A little girl tumbles and twirls through the world, much the way the wind does each day.

More information about winter weather preparedness can be found at

https://www.weather.gov/wrn/winter_hazard_infographics.



Assessment

The following single point rubric can be used to assess student understanding. For each of the criteria listed below, either circle the proficient description or add notes to a box indicating why the student’s performance was either lacking or exceptional.

Areas that need improvement. Developing Performance	Criteria for Proficient Performance	Evidence of exceeding standards. Advanced Performance
	Can explain how weather forecasts help us.	
	When asked “What do we need to know to make weather forecasts)?” students reference observations and information that is collected and studied.	