



FSC PROGRAM DESCRIPTION

4405 – Whys of Weather

Grade Level: 4th grade

Instructor: Mr. Sean Fankhauser,
Dr. Kate Wejnert
Mr. Mark Lancaster
Ms. Rachael Lambert

Type: Single Visit to FSC

Length: 60 minutes

Location: Fernbank Science Center

Capacity: One grade level per day (200 max)
(classes will be combined)

Program Description

You'll leave the Planetarium looking to the sky in awe! Blast off on an astronomical meteorological adventure where your 4th graders will uncover the mysteries behind Earth's seasons and master the art of weather maps and forecasting! Students will marvel at captivating clips about the changing seasons and watch the stars transform across the night sky. Then, they'll dive into hands-on fun, acting out weather map components like fronts and pressure changes, bringing weather patterns to life. This dynamic program blends cosmic exploration with meteorological mastery, sparking curiosity about our planet and beyond!

Notes

If you schedule this program (The Whys of Weather #4405) for your students, please do not schedule the Outreach program called, "Extreme Weather (#4436)," as these two programs cover similar content.

Georgia Performance Standards

S4E1. Obtain, evaluate, and communicate information to compare and contrast the physical attributes of stars and planets.

c. Construct an explanation of the differences between stars and planets

S4E2. Obtain, evaluate, and communicate information to model the effects of the position and motion of the Earth and the moon in relation to the sun as observed from the Earth.

c. Construct an explanation of how the Earth's orbit, with its consistent tilt, affects seasonal changes.

S4E4. Obtain, evaluate, and communicate information to predict weather events and infer weather patterns using weather charts/maps and collected weather data

b. Interpret data from weather maps, including fronts (warm, cold, and stationary), temperature, pressure, and precipitation to make an informed prediction about tomorrow's weather.

d. Construct an explanation based on research to communicate the difference between weather and climate.

Vocabulary

seasons, constellations, orbit, revolve, axis, northern hemisphere, southern hemisphere, rotate, high pressure, low pressure, cold front, warm front, stationary front, weather, climate, forecast, predict, precipitation

Learning Targets	Success Criteria
Students will understand and explain why Earth has different seasons. Students will locate and identify planets and common constellations in the night sky and witness how they move across the night sky and between seasons.	Students can accurately describe how Earth's orbit and tilt cause seasonal changes and provide examples of seasonal variations. Students will locate and identify the moon, North Star and common constellations (seasonal) like Orion, Cassiopeia, Big Dipper (asterism) in the night sky.
Students will learn the distinct differences between weather and climate.	Students can describe the difference between weather and climate.
Students will learn how to read and interpret a weather map, make weather predictions and identify/ describe patterns of weather associated with different weather systems.	Students can identify and explain the meaning of various weather map symbols, including fronts (warm, cold, stationary), pressure systems, and precipitation. Students can use information from weather maps to predict weather in the next few days.

Science Cross-Cutting Concepts

		
Students identify patterns in seasonal changes and weather map data. Students identify patterns of stars and their motion in the night sky and patterns of the sun's position in the sky through different seasons.	Students observe how Earth's orbit and tilt cause seasonal changes and how weather map elements (like fronts and pressure systems) affect weather.	Students understand weather maps as models of atmospheric systems and the effects of Earth's position and motion as a system.

Science and Engineering Practices

			
Students ask questions about seasonal changes about the sun's position in the sky and weather patterns based on their observations and data.	Students use weather maps and models to represent and predict weather events and seasonal changes caused by Earth's axial tilt.	Students analyze data from weather maps to interpret and predict weather patterns.	Students support their conclusions with evidence from their understanding of weather symbols and the relative positions of stars in the night sky and the sun in the daytime sky.

Pre-Visit Activities

1) Explore the weather maps below and see if your students can identify any patterns of weather (temperature, precipitation, cloud cover) associated with different weather symbols (low pressure, high pressure, cold front, warm front, stationary front).

- Forecast surface weather map: <https://www.wpc.ncep.noaa.gov/basicwx/day0-7loop.html>
- Forecast temperature map: <https://www.wpc.ncep.noaa.gov/exper/ndfdmxmn/map.html>
 - 24-hour temperature change: <https://www.wpc.ncep.noaa.gov/exper/change/change.html>
- Forecast cloud cover map (and other variables):
 - <https://graphical.weather.gov/sectors/sectorDay.php?view=public§or=conus&element=Sky>

2) Have students watch GPB's "The Weather Channel" video using the See/Think/Wonder strategy. Show the video then pose the following three questions in order. Pause after each question to give students time to reflect.

1. What do you see? (elicit observations, not interpretations)
2. What do you think is going on? What makes you say that?
3. What do you wonder? or What does it make you wonder?

Generate a list of the student's "What do you wonder?" questions to ask during the program.

Post-Visit Activity

1. After the visit have students continue to track the weather, however this time have them look at daily weather maps and make predictions about weather over the next few days:
 - Current weather map: <https://www.wpc.ncep.noaa.gov/#page=sfc>
 - Click "Options" at the top left corner of the map and you can select "Fronts Only" to declutter the map.
 - Forecast weather maps:
 - From the [WPC homepage](#), hover over "Forecasts & Analyses" in the menu bar
 - Select "Day ½ to 2 ½" for short term forecasts ([direct link](#))
 - Select "Day 3-7 CONUS" for longer term forecasts ([direct link](#))
 - scroll down to "Sea Level Pressure and Fronts". You'll see "CONUS view"
 - CONUS = contiguous United States
2. Analyze a weather map from the date of birth of a student in the classroom.
 - Weather maps 2003 – present: <https://www.wpc.ncep.noaa.gov/dailywxmap/>

Satellite resource (<- click to access):

This is a fun resource to explore with real-time satellite data.

Weather Videos

Below are links to some short weather videos that can be used in your classrooms. Feel free to share with your fellow teachers and students.

- [Clouds](#)
- [Evaporation & Condensation](#)
- [Fronts](#)
- [Meteorologists](#)
- [Precipitation](#)
 - [Freezing Rain](#)
 - [Hail](#)
 - [Rain](#)
 - [Sleet](#)
 - [Snow](#)
- [Weather Instruments](#)

Additional Resources

<https://www.noaa.gov/jetstream/topic-matrix>

[http://ww2010.atmos.uiuc.edu/\(Gh\)/guides/mtr/cld/home.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/cld/home.rxml)

Roles & Expectations

Students

- Students are expected to be respectful, ask questions, remain engaged, and avoid distractions like cell phones.

FSC Instructor

- Prior to the program, the FSC Instructor will communicate with the classroom teacher to develop a schedule and to share the roles and expectations.

Classroom Teacher

- The Classroom Teacher is an integral part of the class, and the Classroom Teacher's attentiveness is essential to the success of the program.
- The FSC Instructor is a classroom guest, therefore the normal classroom duties and responsibilities remain with the Classroom Teacher.
- Attend to the normal beginning-of-class duties, then introduce the FSC Instructor.
- Facilitate FSC Instructor and student interactions, prompt students for participation when appropriate.
- After the program, please complete the FSC Program Evaluation Survey using the link or QR Code below.

FSC Program Evaluation Survey Link:

<https://forms.office.com/r/CSckZYqxjY>

