FSC PROGRAM DESCRIPTION
1405 - Force Five

Grade Level: 4th Grade

Instructor: Lancaster, Lambert

Location: Planetarium

Type: Single Visit

Capacity: 275

Length: 45 Minutes

Program Description

Come explore, and experience, the most powerful storms on Earth: a hurricane at sea, a tornado's funnel cloud, and a huge solar storm. Learn now these storms develop over time, and how they can turn into cataclysmic events.

Georgia Performance Standards

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.

- **a.** Develop a model to support an explanation of why the length of day and night change throughout the year.
- **b.** Develop a model based on observations to describe the repeating pattern of the phases of the moon (new, crescent, quarter, gibbous, and full).
- **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.

- **a.** Construct an explanation of how weather instruments (thermometer, rain gauge, barometer, wind vane, and anemometer) are used in gathering weather data and making forecasts.
- **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.
- **c.** Ask questions and use observations of cloud types (cirrus, stratus, and cumulus) and data of weather conditions to predict weather events.
- **d.** Construct an explanation based on research to communicate the difference between weather and climate.

Vocabulary

Hurricane, Tornado, Vortex, Solar Flare, Atmosphere, Climate, Weather, Meteorology

Learning Targets	Success Criteria
Students will understand and explain why Earth has different seasons.	Students can accurately describe how Earth's orbit and tilt cause seasonal changes and provide examples of seasonal variations.
Students will learn how to read and interpret a weather map.	Students can identify and explain the meaning of various weather map symbols, including fronts (warm, cold, stationary), pressure systems, and precipitation.
Students will use weather maps and data to make weather predictions.	Students can use information from weather maps to predict tomorrow's weather, explaining their reasoning based on observed data such as temperature, pressure, and precipitation.

Science Cross Cutting Concepts

		
Students identify patterns that create strong storms, such as Tornado Alley.	Students observe how Earth's weather patterns create category 5 storms on Earth.	Students understand how tracking Sunspot activity can help to understand the flow of solar particles through space that can affect the Earth.

Science and Engineering Practices

		
Students ask questions about seasonal changes and weather patterns based on their observations and data.	Students use weather maps and models to represent and predict weather events.	Students are able to analyze conditions on Earth to predict passible storm formation.

Pre-Visit Activities

This site offers a questionnaire for students to take before their visit:
https://www.eplanetarium.com/shows/ddome/rice/force_five/

An introduction to tornadoes: https://www.scholastic.com/teachers/articles/teaching-content/tornadoes/

NASA's hurricane resource page, with information about the latest storms:
https://www.nasa.gov/mission_pages/hurricanes/main/index.html

Post-Visit Activity

NASA's SciJinks site hosts games and puzzles to practice, and assess learning: http://scijinks.jpl.nasa.gov/wild-weather-adventure/

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

FSC Program Evaluation Survey Link:

https://forms.office.com/r/CSCkZYqxjY