Virtual STEAM Mobile—Meteorology

It's the Weather!

Badge Requirements:

- Daisy Space Science Explorer Step 1
- Seniors Sky Badge Steps 1 and 2

Materials

- Activity 1
  - Pencil
  - Paper
  - Crayons, markers, colored pencils, etc.
- Activity 2
  - A clear or glass jar
  - Shaving cream
  - Water
  - Food coloring
  - Dropper or straw

Introduction

Meteorologists use many different aspects of the weather to help them make forecasts. Meteorologists study the earth's atmosphere, particularly climate and weather, in order to forecast weather conditions.

It is important for us to know what the weather is going to be so we can prepare. You need to know if you need to wear a coat, grab an umbrella or put sun screen on.

On a bigger scale, communities, cities, states, and even countries use forecasts to help prepare for large weather events like hurricanes, tornadoes, and winter storms.

Observe the Sky

One aspect of the weather that meteorologist use for their forecasts are the clouds. We see clouds nearly every day, some are white and puffy, while other times they are dark and flat. Different clouds translate to different types of weather. It is import for meteorologists to observe the clouds and it is important for us, as well.

Cirrus: These clouds are seen high in the sky and typically signal calm, fair weather.

Cumulonimbus: These clouds can grow very tall (some as high as airplanes fly) and are sometimes referred to as thunderstorm clouds. These clouds are associated with violent thunderstorms.

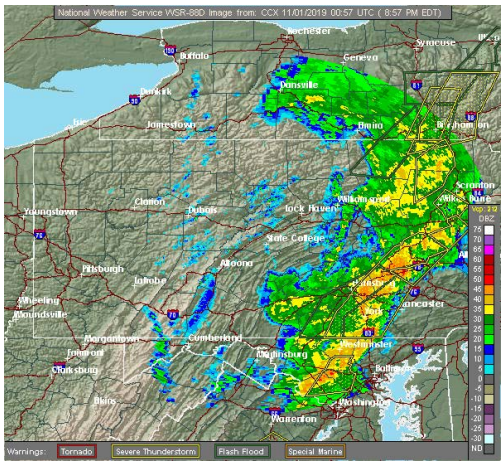
Cumulus: The base of these clouds is flat and much closer to the ground than cirrus. These clouds can be associated with fair or stormy weather, depending on how large they grow.

Stratus: These clouds can look like a huge grey blanket in the sky. They can be a sign that rain or snow is on the way. When these clouds are close to the ground, they are referred to as fog.

Activity One:
For one day, track the weather in your area.

1. The Science - Take a look at the sky today. Can you identify the clouds? (https://scied.ucar.edu/learning-zone/clouds/cloud-types)
    - Grab some paper and a pencil, or pen, or crayon, and draw some of the clouds you see. Are there any shapes?
    - Add notes of your observations to the drawings. Are they moving? Growing taller? Are they light or dark? Are they thin or puffy? Big or small? Are they high or low in the sky?
    - What do the clouds tell you about the weather of the day? Create your own forecast for the day.
2. Compare forecasts (Cadettes, Seniors, Ambassadors
    - Visit AccuWeather www.accuweather.com and the National Weather Service www.nws.noaa.gov, compare their forecasts for your area, are they similar?

3. Check in (Cadettes, Seniors, Ambassadors)
    - Throughout the day stop and make observations of the clouds, what is changing? What does that tell you about the weather?
    - Meteorologists use radar, satellites, and current conditions to get accurate forecasts. If you do not know what is currently happening, you will not be able to predict what is expected during the next few hours or days. Computer models are other tools that meteorologists use, these are just guidance.
    - Meteorologists also rely on their experience. The weather likes to repeat itself; so, meteorologists can relate past experiences to what is expected in the future. So, the more experience YOU have and the more observations YOU make, the better YOUR forecast will be.



Fun Fact: The average cumulus cloud weighs 1.1 million pounds. The clouds are floating in the sky and not falling on us because the air below it is even heavier, the less dense cloud is able to float on the dryer more-dense air. (How much does a Cloud Weigh?)

Activity Two: Shaving Cream Rain Clouds
(Activity and Photo Credit: https://thestemlaboratory.com/rain-cloud-jar/)

Fill your glass or jar ¾ of the way with water. Add shaving cream to the top. This is your fluffy cloud.

Mix some food coloring with some water in a separate container, you will add this slowly with the dropper on to the shaving cream.

As you add the drops of the colored water to the cloud, the water gets heavier and heavier. Eventually it will start to fall out of the cloud and rain.
This is similar to what happens in real clouds. The water droplets get heavier and heavier until they fall down as rain or snow.