Learning Objective: Weather Prediction

NGSS Standard: MS-ESS2.D-2 - Because these patterns are so complex, weather can only be predicted probabilistically.

Objective:
Students will be able to:

1. Describe the four types of air masses and how they interact to form fronts.
2. Explain the causes of weather associated with different fronts.
3. Describe how the meeting of certain fronts can cause extreme weather events.

Time Required: 90 minutes

Materials Needed:

- Teacher computer with internet access and projector
- Student computers/laptop/tablet with internet access (preferably one per student but at least enough for small groups of 3 -4 students)
- Weather Map Practice handout (attached)

Teacher Preparation:

- Create Playlist 1, a 10-minute playlist in Legends of Learning with the following game found in the Weather Prediction learning objective:
  - *Forecaster*
- Create Playlist 2, a 20-minute playlist in Legends of Learning with the following game found in the Weather Prediction learning objective:
  - *Sunshine City*
- Make copies of Weather Map Practice handout

Engage: 15 minutes

1) The teacher will play the following videos:
   a. Air Masses and Fronts - https://www.youtube.com/watch?v=BUMcztXPFbA
   b. Weather Information Part 2 - Air Masses and Fronts - https://www.youtube.com/watch?v=o4lg8UfY5DM
2) The students will take notes in their science journal on the different types of air masses and fronts described in the two videos.
3) The teacher will ask the following questions to prompt discussion from the class.
   a. Do you ever watch the weather report on the news? What kind of information does the reporter show?
   b. What is the weather today? Tell me your guess for the temperature and the likelihood of rain.

Explore: 10 minutes

1) Students will sign in to Legends of Learning and enter your teacher code.
2) Teacher will launch Playlist 1
3) Students will complete *Forecaster* as the teacher assists students as needed. Stopping game play to address the questions asked in the game may be needed.

Explain: 20 minutes

1) Student will be given the Weather Map Practice handout. Teacher should also display the map on a projector/Smartboard so that the students are able to see the colors on the map.
2) Student will answer the following questions:
    a. What kind of weather conditions do you think are associated with the blue line with triangles on it?
        a. ***Cold Front***
    b. Based on your observations, which states and regions may be having severe weather on this day? Give your reasons why.
        a. ***Oklahoma, Arizona, California; all of those states contain an 'L"'(which designates a low pressure system) which typically is accompanied by stormy weather. BONUS: Newfoundland (not a state; however it contains an 'L')***
    c. What kind of weather would you expect where the warm and cold fronts meet in western Canada? Why?
        a. ***Clear to partly cloudy. Where warm and cold fronts meet is called a stationary front, and weather along a stationary front is typically calm.***

3) Teacher will discuss the answers to the handout with the students.

Elaborate: 25 minutes

1) Students will log on to The NOAA National Weather Service Just for Kids website. https://www.weather.gov/cae/justforkids.html
2) The students will first click on the tab labeled Forecast Maps http://www.wpc.ncep.noaa.gov/national_forecast/natfcst.php
3) The students will describe the national weather on that day by analyzing the "Today's Forecast" tab. They will do the same for the next two days by clicking on the tabs "Tomorrow's Forecast" and "Day 3 Forecast", respectively.
    a. Students will write their weather forecast for each in their science journal.
4) Students will then try to forecast what the weather will be on Day 4.
    a. Students will write their weather prediction in their science journal.
5) Using the "Today's Forecast" Map, students will make a hypothesis what the weather will be like in their home town/city for the next three days.
    a. Students will write their predictions in their science journal.
6) Teacher will discuss student predictions as a whole class.
7) Teach will display the The NOAA National Weather Service Just for Kids page and will check the accuracy of their forecasts by entering their city name or zip code in the "Customize your Weather.gov" section on the top left of the screen.
8) If time allows, students may proceed to the Weather Information Display icon and make their own weather maps by customizing the parameters displayed.

Evaluate: 20 minutes

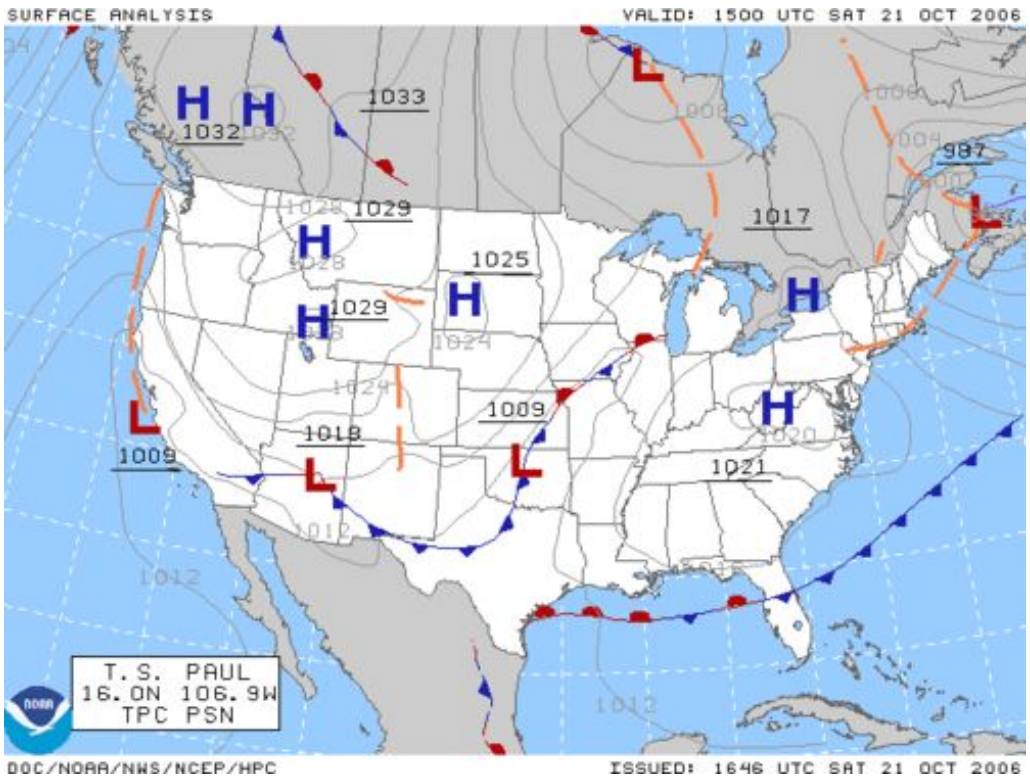
1) Launch Playlist 2 for students.
2) Students will play *Sunshine City* and be assessed on their ability to answer the questions provided in the game correctly.
3) Teacher will analyze student results to determine what concepts need to be a focus for reteaching.

Additional Lesson Strategies: • To use Legends for additional instruction, create a custom playlist with an instructional game and pre and post assessment. • To use Legends for a quick formative assessment, create a 5-question assessment in a playlist. • To use Legends for a student-directed experience, create a targeted freeplay playlist. • Encourage students to play on their own at home in Legends of Learning: Awakening for a student-driven experience including avatars, battling, and quests all centered around topics they are covering in class.

Name: _____ Date: _____

Weather Map Practice

Directions: Using the map below, answer the given questions..



1) What kind of weather conditions do you think are associated with the blue line with triangles on it?

_____

2) Based on your observations, which states/regions may be experiencing severe weather this day? Why?

_____

_____

_____

3) What kind of weather would you expect where the warm and cold fronts meet in Western Canada? Why?

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