**Satellites, Weather and Climate**
**Lesson plan summary: Weather**
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Grade Level: 9-12
Curriculum Target Benchmarks:
Subject keywords: Weather, Unisys

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# Weather Unit

Proficiencies

Students can interpret and record data from the Unisys weather site
Students will graph the monthly averages for specific recorded data and record relationships between this data collected
Students will describe the current local weather from a surface weather analysis
Students will understand how meteorologists predict weather based on interpretations of a surface weather analysis

Daily Weather:
http://weather.unisys.com/surface/meteogram/sfc_met.php?inv=1&city=alb&region=ne

Daily assignment:

- Collect data for temperature, dew point, atmospheric pressure, wind speed, humidity and cloud cover.
- Record the most recent data which would be the numbers or symbols on the far right.
- Since classes meet every other day, record yesterday's data also. The charts illustrate 25 hours of previous data which will allow you to do this.

Long Term Assignment

- Summarize average monthly data
- Transfer to an electronic spreadsheet as the final report which will consist of a monthly graph giving the high, low, mean, median, mode and range values.
- Data will be collected for March, April, and May
- Construct a graph per month for the data collected
- How to make a graph from excel data,
- http://blog.hubspot.com/marketing/how-to-build-excel-graph

# Reading and Understanding Weather Maps

- Go to the following weather site to answer the questions below: http://weather.unisys.com/surface/meteogram/sfc_met.php?inv=1&city=alb&region=ne

For each of the charts and abbreviations on the left of the charts, give a short description.

1. Top chart with 'temp' as the vertical axis. Give the color and description for both lines?

2. Extt

    a. What are the high and low temps in the last 25 hours?

3. Wx

    a. To find out what the weather symbols mean, click on the 'Information' tab on the left, then click on the 'Symbol Legend' tab to discover the symbols meaning. What is the symbol for light snow showers?

4. Snwdp

    a. How much snow has fallen and for which time period?

5. Prec

    a. How much precipitation?

6. Vis

7. Wgst –

8. Wind

9. Middle chart : clds

| Symbol | Indicates |
|---|---|
| The letter C | |
| One short dash - | |
| Two short dashes - - | |
| One long dash ▬ | |

a. cldcl – what do these numbers indicate?

10. Third chart: pr alt

11. Bottom black numbers - Explain universal time and how this compares to our traditional clocks in which the highest number is 12. *This site helps you with question # 11 #1http://www.nhc.noaa.gov/aboututc.shtml*

| Universal time | Vermont time (EST) | Vermont time (Daylight savings) |
|---|---|---|
| 00Z | 7 pm | 8 pm |
| | 3pm | |
| 19Z | | |
| 04Z | | |

| | | |
|---|---|---|
| | 8AM | |
| | | 11AM |

# General Weather Map Interpretation

**A. Symbol legend**

Go to the sight, http://weather.unisys.com/ and complete the following assignment. In the upper right corner, type in 05401 to see our region's weather.

1. At the top is the 'Latest Observation for Burlington'. To the right of 'Regional Plots' are four blue categories. Click on 'Surface'. Locate Burlington and copy the symbol and numbers below. Click on 'Information' located on the left side, then on 'Symbol Legend' under the General Information heading. Locate the 'Surface Station Plot' box and interpret Burlington's weather as they do in the example.

2. Do this for two other locations in the US. Be sure to choose one location that is experiencing different weather such as Florida, Texas, California or Arizona.

| Location | 1. Burlington | 2. | 3. |
|---|---|---|---|
| Symbol | | | |
| | | | |
| Temp. (F) | | | |
| Precipitation, type | | | |
| Dewpoint (F) | | | |
| Pressure | | | |
| Cloud cover | | | |
| Wind speed | | | |

| | | | |
|---|---|---|---|
| | | | |

3. Draw the correct weather symbol for the following weather conditions:

a. Temp = 85; Dew Point = 82; winds out of the SE at 25 knots, light rain showers, 1020 millibars pressure, with a 50 % cloud coverage.

b. Temp = 32; Dew Point = 31; winds out of the nw at 5 knots, freezing rain, 980 millibars pressure, with a 100 % cloud coverage.

| Weather symbol for 'a' | Weather symbol for 'b' |
|---|---|
| | |

**B. Map reading**

Go to the site http://weather.unisys.com/ and type in zip code 05401

1. The Radar Map

- Now click on the Radar blue tab to the right of Regional Plots.
- Explain what each color codes for in regards to precipitation: (if you go to *Radar Data* under analysis and then click on *more information*, the colors are interpreted in more detail)

| | |
|---|---|
| Greens, yellow and reds? | |
| Pinks? | |
| Blues | |

| | |
|---|---|

2. Looking at this current map, describe the precipitation and its location (which parts of states are experiencing precipitation.)

3. Above the map is the heading, Region. Click on 'US' and describe which regions are receiving precipitation and the types of precipitation occurring. . You do not have to mention individual states, just regions.

4. Visible image map: Click on the 'Vis' tab located in the image row. Explain what this map illustrates. What is the major limitation of this map? What is the difference between snow and clouds on an image such as this? If they both reflect and show up as white, how would you know if there were clouds present?

5. Click on the US tab and then go back and forth between Radar and Visible images…is there a connection between the two?

6. Notice in the Region row the letters, GOES-E, GOES-W, and HEM. Click on each of these to see the image they illustrate and write a brief description of the view.

7. Infrared map: Click on the 'IR' tab in the Image row and explain this map. What does infrared detect? Is it available 24 hours?

8. Fill in the table below to distinguish between brighter and darker regions.

| Category | Bright | Dark |
|---|---|---|
| Temperature | | |
| Altitude | | |
| Land surfaces vs. clouds | | |

| | | |
|---|---|---|
| Low clouds vs. high clouds | | |
| Thunderstorm clouds | | |

9. Enhance Infrared Image: Go to the 'enh ER' tab and explain the data this map gives us. Describe what is happening in Vermont as well as the US. Where is strong precipitation occurring in the US? What color indicates strong precipitation? Which color indicates thunderstorms? What do the tic marks indicate?

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