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Mid-Latitude Cyclones


STORM Project

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Activity 6
Mid-Latitude Cyclones
Level 2

<http://www.uni.edu/storm/activities/level2/index.shtml>

National Science Education Standards: As a result of activities in grades 5-8, all students should develop an understanding about scientific inquiry, structure of the earth system, and understandings about science and technology.

Teacher note: Before completing this activity students should have a basic understanding of air temperature, dew point temperature, basic weather map symbols, and air masses.

Engage:

At the activity website, <http://www.uni.edu/storm/activities/level2/act6.shtml>, access the Current Weather map.

1. Where is a low-pressure system located?
2. Where is a high-pressure system located?

Explore:

Assist your students with the following steps as required.

At the activity website access the Current Weather map again. Study the map to answer the following questions:

1. What types of fronts are associated with a low-pressure system?
2. What is the difference between the air temperature ahead of the cold front and behind the same front?
3. How do the dew point temperatures on either side of the cold front compare?
4. Is there any precipitation along the cold front? If so, where does it fall with respect to the location of the front?
5. Now find the warm front on the map. Describe how the temperatures change on either side of this front.
6. From what direction is the warmer air coming?
7. From what direction is the colder air coming?

Explain:

Tell students that a well defined low-pressure, with warm fronts and cold fronts, is called a mid-latitude cyclone. Explain to your students that the warm sector of a mid-latitude cyclone is the area located between the leading warm front and trailing cold front. The cold-sector is the area behind the cold front. Students should observe that temperatures and dew points are somewhat higher in towns and cities located in the warm sector, when

compared to locations in the cold sector. The cool sector is the area generally in the northeast quadrant of the mid-latitude cyclone, ahead of the advancing warm front.

1. Find your state on the current weather map. Describe the conditions found in your state.
 - a. Location in relation to a front (identify whether it is cold or warm)
 - b. Temperatures
 - c. Dew Points
 - d. Wind direction and speed
 - e. Precipitation
2. Is your state in the warm, cold, or cool sector?
3. Write a general description of the weather occurring ahead of and behind a cold front.
4. Write a general description of the weather occurring ahead of and behind a warm front.

Extend:

From the activity website access the Current Weather map.

1. Plot the center of Lows (cyclones) and Highs (anticyclones) for five consecutive days. You should select only those well-defined cyclones or anticyclones. Plot them on the attached US map using colored pencils to indicate high and low pressure systems. Also plot fronts associated with the low-pressures.
2. Describe the general direction of movement of these cyclones and anticyclones.

Evaluate:

Collect student sheets.

For Further Inquiry:

Have your students access the Satellite and Fronts map at the activity website. Challenge them to design an investigation to develop a relationship between clouds, fronts, and High and Low Pressure systems. Tell them to use what they learned

Mid-Latitude Cyclones

Student sheet

Engage:

From the activity website, <http://www.uni.edu/storm/activities/level2/act6.shtml>, access the Current Weather map.

1. Where is a low-pressure system located?

2. Where is a high-pressure system located?

Explore:

At the activity website access the Current Weather map. Use the information to answer the following questions.

1. What types of fronts are associated with a low-pressure system?

2. What is the difference between the air temperature ahead of the cold front and behind the same front?

3. How do the dew point temperatures on either side of the cold front compare?

4. Is there any precipitation along the cold front? If so, where does it fall with respect to the location of the front?

5. Find the warm front on the map. Describe how the temperatures change on either side of this front.

6. From what direction is the warmer air coming?

7. From what direction is the colder air coming?

Explain:

1. Find your state on the current weather map. Describe the conditions found in your state.

a. Location in relation to a front (identify whether it is cold or warm)

b. Temperature

c. Dew Point

d. Wind direction and speed

e. Precipitation

2. Is your state located in the cold, warm, or cool sector of a mid-latitude cyclone? Explain how you know.

3. Write a general description of the weather occurring ahead of and behind a cold front.

4. Write a general description of the weather occurring ahead of and behind a warm front.

Extend:

From the activity website access the Current Weather map.

1. Plot the center of Lows (cyclones) and Highs (anticyclones) for five consecutive days. You should select only those well-defined cyclones or anticyclones. Plot them on the attached US map using colored pencils to indicate high and low pressure systems. Also plot fronts associated with the low-pressures.

2. Describe the general direction of movement of these cyclones and anticyclones.

