

2007

Weather Around Highs and Lows

STORM Project

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Activity 13
Weather Around Highs and Lows
Level 1

Objectives:

1. Students will develop an understanding of precipitation patterns associated with high pressure and low pressure areas.
2. Students will develop an understanding of temperature patterns associated with high pressure and low pressure areas.

National Science Education Standards: All students should develop an understanding of: properties of objects and materials, properties of earth materials, and changes in earth and sky.

All students should develop an understanding of: structure of earth system, science and technology, risks and benefits, and science and technology in society.

Teachers Notes:

To access the activity website, go to <http://www.uni.edu/storm/activities/level1/>.

Include an explanation with this activity about what the H and L mean in relation to what the parcels of air are actually doing to these areas of pressure. The air around the center of the H, or high-pressure system is actually denser and sinks toward the ground. This air is denser (more particles of air in a given volume) and often traps air pollution on the ground. The air around the center of an L, or low-pressure system is air less dense and rises. Less dense means there are fewer particles per equal volumes of air. When measuring air pressure with a barometer, the high pressure pushes against the barometer and causes the pressure to rise. As the pressure decreases, the air doesn't push as hard against the barometer and the pressure drops.

Engage:

1. At the activity website, access and display the satellite map.
2. Have students study the satellite image.
3. Ask students to predict where there might be Highs (H) and Lows (L), and cold fronts and warm fronts, and precipitation on the surface.
4. Ask students how they arrived at their predictions.

Explore:

1. Using the activity website, access the current US surface map. This map shows station models, fronts and pressure systems and precipitation.
2. Have students observe the map.
3. Ask students how their predictions above compare to what is shown on the surface map.

Explain:

1. Most precipitation and clouds occur in the vicinity of low-pressure systems, and along fronts. Air rises in low-pressure systems, cools and forms clouds. Air sinks in high-pressure areas, warms, and generally produces fair weather.
2. Have students study the current surface map again. Have them circle areas where warmer temperatures and higher dew points occur. Do the same with lower temperatures and dew points.
3. Have students tell where they see precipitation near the low-pressure system.

Extend:

1. From the activity website, access the surface maps for several days. Have the students track the movement of the systems across the US for several days.
2. Plot the location of the H's and L's on the attached blank USA map.
3. As they track the H's and L's have them record the weather for each location.

Evaluate:

1. Monitor student progress and collect maps.

For Further Inquiry:

Ask students how they can use their knowledge of Highs and Lows and fronts to make a weather forecast for a city toward which one of these systems is moving. Have students design an investigation to answer this or any other question they have about weather around highs and lows.

