**How Do Meteorologists Predict The Weather?**

**I. Introduction**

Weather refers to the present state of the atmosphere, air pressure, wind, temperature, and humidity. Meteorologists study weather by taking measurements of these conditions. The National Weather Service collects the measurements and records them on maps using a combination of symbols. These symbols form a station model which shows the weather conditions at one specific location.

Some conditions shown on a station model are : wind speed and direction, barometric pressure, change in barometric pressure in the last three hours, fraction of sky covered by clouds, dew point temperature, type of precipitation, and temperature. A sample is shown below.



With the information from a station model, meteorologists can predict the weather. For example, meteorologists know that high pressure is generally associated with fair weather and low pressure is usually associated with cloudy weather. If the barometric pressure is rising, weather is probably improving. The dew point indicates the temperature at which air is saturated and condensation occurs. These measurements, along with others, help meteorologists predict what kind of weather may be ahead.

In this Virtual Lab, you will explore weather data collected over several days at stations in a certain region of the United States. Then you will make a prediction about the weather at those stations. When making your predictions, remember that weather systems generally move from west to east. Use the data from the westernmost station model in a region to predict the weather for the region’s other stations.

**II. Procedure**

1. Go to the following website :

<http://glencoe.mheducation.com/sites/007877828x/student_view0/chapter2/virtual_lab.ht>

2. Click a region on the U.S. map. Each blue circle represents a weather station model.

3. Click the Station Model key to see what each symbol in a station model means (*or refer to the diagram above*).

4. **Day 1**

: Explore the weather conditions at each station by clicking each station model. Record your data for each region

in the Data Table. Once all data are recorded, predict the weather for the next day.

5. **Day 2**

: Click the Next Day button to display the station models for Day 2. Record the conditions and predict the next

day’s weather.

6. **Day 3**

: Click the Next Day button to display the station models for Day 3. Record the conditions and predict the next

day’s weather.

7. **Day 4**

: Click the Next Day button to display the region’s westernmost station model. Predict the weather for the

region’s other three stations for this day. Choose a station model from the five models on the right of the screen.

Drag the station model to a station on the map. Repeat this step for each station in the region. Record the

weather conditions in the Data Table.

8. Click “Check” to verify your predictions. Compare your selections with the correct station models shown in white.

9. Repeat this activity using other regions of the United States.

**III. Data Table & Anaylsis**

**A. Western Region** : City = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **Day** | **Weather** | **Temp.** | **Wind**  **Speed** | **Wind**  **Direction** | **Pressure** | **Change In**  **Pressure** | **Cloud**  **Cover** | **Dew**  **Point** |
| **1 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |
| **2 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |
| **3 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |
| **4 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |

1. How do the current conditions on Day 4 in the westernmost city in the region compare to your predicted conditions?

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2. How did your predictions compare with the actual weather conditions, as shown on the white station models?

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3. What observations did you find most helpful in predicting the weather conditions? Why?

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**B. Midwestern Region** : City = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **Day** | **Weather** | **Temp.** | **Wind**  **Speed** | **Wind**  **Direction** | **Pressure** | **Change In**  **Pressure** | **Cloud**  **Cover** | **Dew**  **Point** |
| **1 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |
| **2 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |
| **3 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |
| **4 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |

1. How do the current conditions on Day 4 in the westernmost city in the region compare to your predicted conditions?

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2. How did your predictions compare with the actual weather conditions, as shown on the white station models?

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3. What observations did you find most helpful in predicting the weather conditions? Why?

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**C. Southwestern Region** : City = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **Day** | **Weather** | **Temp.** | **Wind**  **Speed** | **Wind**  **Direction** | **Pressure** | **Change In**  **Pressure** | **Cloud**  **Cover** | **Dew**  **Point** |
| **1 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |
| **2 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |
| **3 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |
| **4 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |

1. How do the current conditions on Day 4 in the westernmost city in the region compare to your predicted conditions?

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2. How did your predictions compare with the actual weather conditions, as shown on the white station models?

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3. What observations did you find most helpful in predicting the weather conditions? Why?

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**D. Northeastern Region** : City = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **Day** | **Weather** | **Temp.** | **Wind**  **Speed** | **Wind**  **Direction** | **Pressure** | **Change In**  **Pressure** | **Cloud**  **Cover** | **Dew**  **Point** |
| **1 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |
| **2 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |
| **3 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |
| **4 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |

1. How do the current conditions on Day 4 in the westernmost city in the region compare to your predicted conditions?

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2. How did your predictions compare with the actual weather conditions, as shown on the white station models?

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3. What observations did you find most helpful in predicting the weather conditions? Why?

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**E. Southeastern Region** : City = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **Day** | **Weather** | **Temp.** | **Wind**  **Speed** | **Wind**  **Direction** | **Pressure** | **Change In**  **Pressure** | **Cloud**  **Cover** | **Dew**  **Point** |
| **1 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |
| **2 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |
| **3 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |
| **4 : Actual** |  |  |  |  |  |  |  |  |
| (Prediction) |  |  |  |  |  |  |  |  |

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2. How did your predictions compare with the actual weather conditions, as shown on the white station models?

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