

Student Instructions for Weather Centres

Your group will spend 20 minutes at each of the 6 weather centres provided. At three centres, you will be asked to read materials from the textbook. Additional reading material may also be provided. Three stations are computer-based. Two of these will have PowerPoint presentations for you to view. One computer station is to be used to do Internet research to find information for the group to use when building your own weather station.

A set of questions has been provided for each station. Each person in your group must answer the questions, based on the materials you have used at each station.

After the completion of all centres, your group will have a good idea of how a weather station works and you will have already researched many ideas of how to make your weather station. Your group will have to discuss how you will organize the building of your weather station. Among other decisions, you should agree about who will bring which materials to build the weather stations, and how you will divide the tasks.

In the next class, your group must bring the materials you will need to construct your weather station, and you will put your instruments together. Once the station is constructed, you must decide as a group what area of the school grounds would be the best location to set up the weather station. Use the information you gathered from the centres to help with this decision.

Your group will collect data from the various instruments of your weather station for the next few days, according to your teacher's instructions. Record your data in an appropriate format.

After all the data is collected, your group should use a spreadsheet software to input your data from each instrument and then graph the data over time. Create a graph of this data. This will give you a visual representation of the weather during the time you collected the data. Compare your group's data with the rest of the class and also compare it to the local newspapers forecast. Consider how accurate your data was, and record some ideas for ways to improve the accuracy of the data you collected.

Final Products:

- Each **student** will submit his / her individual answers to the questions provided below.
- Each **group** will cooperate in the construction of a weather station, and in the collection of data from the station.
- Each **group** will incorporate their data into a spreadsheet and create a graph of data vs time.
- Each **group** will submit a one-page reflection discussing the accuracy of their weather station and ways the data collection may have been improved.

OPTIONAL – teacher's choice:

- Each **group** will create a PowerPoint presentation to discuss the technologies used to gather weather data. Groups could be assigned a particular aspect of weather forecasting and asked to do presentations that are similar to the ones provided for Air Pressure and Wind.

Weather Centres

Centre 1 – SciencePower 10, page 520 - Measuring Humidity

Centre 2 – PowerPoint Presentation – Measuring Air Pressure

Centre 3 – SciencePower 10, page 518 – Measuring Temperature

Centre 4 – PowerPoint Presentation – Measuring Wind

Centre 5 – SciencePower 10, pages 528 to 531 – Measuring Precipitation and a World of Weather Data

Centre 6 – Research methods for building your own weather station

Questions:

Centre 1 – Measuring Humidity

1. What is humidity?
2. What instruments are used to measure humidity? Explain how each of them works.
3. Why must a sling psychrometer be swung in the air?
4. What would be the relative humidity if the dry bulb temperature is 25°C and the wet bulb temperature is 31°C? What does that relative humidity tell you?

Centre 2 – Measuring Air Pressure

1. What is air pressure?
2. What instrument is used to measure air pressure?
3. Explain how each instrument works.
4. What is latest technology to calculate air pressure? How does it work?
5. What unit is used to record the amount of air pressure?
6. How do meteorologists display air pressure data on weather maps?

Centre 3 – Measuring Temperature and Precipitation

1. Who invented the first ever thermometer?
2. What principle did he/she use to create the thermometer? Explain the principle.
3. What is used in today's thermometers?
4. Is that same liquid used in temperature sensors? Why or why not?
5. Explain why the position of temperature is crucial.
6. Why are the boxes painted white?

Centre 4 – Measuring Wind

1. What is wind? How is it created?
2. What is the Beaufort Wind Scale?
3. Who developed the Beaufort wind scale? Why?
4. Why is it valuable to be able to predict wind strength and direction?
5. Describe the instruments are used to collect wind data?
6. Why do you have to be very careful where you place these instruments?
7. What unit do meteorologists use to calculate wind strength?

Centre 5 – Measuring Precipitation and a World of Weather Data

1. What are tipping bucket gauges? How do they work?
2. How would you calculate the amount of snowfall?
3. What is a radiosonde?
4. Explain what a weather balloon is and how it works?
5. What does weather radar detect?
6. Explain how weather radar works.
7. What is a Doppler radar? How does it work?
8. What is the benefit of using weather satellites?
9. Explain the two types of satellites.
10. What are the three detectors on a weather satellite?