Investigating Evaporation

Certain weather variables influence the amount of water that evaporates each day from a standing body of water. In this activity, your team will collect and analyze weather data to find out what variables affect water evaporation amounts.

Procedure

1. Your team will be collecting data once a day for four uninterrupted days. Your teacher will provide you with the initial pan water level. Record that depth on your "Data Sheet" handout.
2. Each day, gather and record the following measurements for both pans on your "Data Sheet" handout.
   - **Air Temperature (in °C):** Read the thermometer that is next to the sheltered pan or find the temperature for your appointed time from another weather source.
   - **Relative Humidity (in percent):** Read the hygrometer or record from another weather source.
   - **Wind Speed (in km/hr):** Read the anemometer or record from another weather source.
   - **Solar Radiation:** Note the amount of cloud cover. For the **unsheltered pan: 1**=all cloudy, **2**=mostly cloudy, **3**=equal mix of sun and clouds, **4**=mostly sunny, **5**=all sunny; for the **sheltered pan**, rate the amount of shade: **1**=fully shaded, **2**=mostly shaded, **3**=partly shaded.
   - **Water Depth (in mm):** Use the ruler to measure the water depth. Measure from the same place each time. If you are a member of Team 2 or Team 4, take your reading, and then fill the pan with room temperature water to the *exact level* of the original water mark. If it has rained during the day or night, remove water from the pan until the water line is at the *exact level* of the original marked starting point.
   - **Precipitation (in mm):** Record any water that has collected in the rain gauge. If you are a member of Team 2 or Team 4, empty the gauge after you take your reading.
3. When all your data has been gathered for the day, perform the following calculations:
   [Water Depth - Precipitation = Adjusted Water Depth]
   [Initial Pan Water Level - Adjusted Water Depth = Evaporation Amount]
4. Use the "Data Sheet" handout to record your data for four consecutive days. Also enter each day's data into the all-class "Measurements Chart."
5. After all the data has been recorded, you will work as a class to analyze it. When you are done, answer the questions on this page.

Questions

Write your answers on a separate piece of paper.

1. How did the pan evaporation amounts change in relation to air temperature? Relative humidity? Wind speed? Solar radiation?
2. Which variables seem to most affect evaporation amounts? Explain your answer.
3. What difference, if any, was there in the amount of evaporation that occurred in the unsheltered location compared to the sheltered location? What might account for any differences?
4. If the amount of sunlight reaching Earth's surface were to decrease, would you expect the evaporation rate on Earth's surface to increase, decrease, or stay the same? Why?
5. What are the limitations of the experiment?
6. What could the class do to have more confidence in the conclusions drawn from this experiment?