

ANSWER KEY**Exercise: 1**

Instructions: Scientists use instruments to obtain information about what the weather is doing and what it might do in the near future. This exercise will give you an introduction to the various instruments that are used for obtaining weather information. Read through the 'Take a Tour' pages and be sure to click on the various instruments to get a close up picture of what each one does and how it works. Answer the following questions completely and accurately.

1. How did early forecasters obtain information on the weather?

Early weather data was collected manually by people on the ground. People also used kites as tools to measure the temperature above the ground by attaching thermometers to them.

2. What is an Automated Surface Observing System (ASOS)?

An Automated Surface Observing System is a series of instruments that the weather service uses to obtain information on the weather.

3. What is a dewpoint sensor? How does this device measure dewpoint?

A dewpoint sensor measures the temperature and dewpoint of the air. It measures dewpoint by cooling a mirror until condensation is observed using a reflected light. The temperature at which condensation occurs is the dewpoint temperature.

4. What is a wind sensor used for? How does this device work?

A wind sensor measures wind speed and direction. Wind speed is measured using a rotating device, the higher the number of rotations during a given period of time, the higher the wind speed. Wind direction is measured using a direction vane.

5. What is a precipitation identification sensor used for?

The precipitation identification sensor detects precipitation type and intensity.

6. How does a cloud height sensor measure the height of clouds?

A cloud height sensor works by transmitting a pulse of laser light into the atmosphere. It senses the reflection of this light off of the clouds. By timing the interval between transmission and reception, it can calculate cloud height.

7. How is visibility measured and how does the device used to measure visibility work?

Visibility is measured using a visibility sensor. It works by transmitting a flash of xenon light through a section of the atmosphere. The atmosphere scatters the light and this scattering is measured. The higher the amount of scattering, the less visibility. This device also computes a day or night indication using an ambient light sensor.

8. How does a roof top rain gauge work? Why do they put windshields around them?

A roof top rain gauge works by using a heated collector that melts anything frozen, the liquid then is funneled to a tipping bucket which measures the amount of liquid. Every time the tipping bucket is filled, it tips over and the number of tips is recorded. Each tip represents .01 inch of rain. The windshield reduces updrafts and streamlines that alter the path of the rain.