Earth Science Name:

# Making the Invisible Visible: Observing and Measuring Weather

When you think about it, most of our weather is invisible. We can't see temperatures, air pressures, or humidity. We can feel, but not see, wind speed and direction. We can see clouds, but they're so high we can't reach them. So to understand current conditions and changes in the atmosphere around us, we need to use **weather instruments**. Like all instruments, these **extend our five senses**. But like all instruments, they often produce measurements with **errors** that need to be identified and taken into consideration when we try to use the data.

In this opening activity to your Weather Unit, you'll find out about important weather instruments. Some of this will be done using slide shows that you can access through your Earth Science class page, and some will be done with actual instruments.

Once we have information about weather variables, we need to learn the best way to describe it so others can know what we find, and we can know what they find. Meteorologists have developed a standardized system that uses numbers and symbols—the **weather station model**. So we will also learn how to create and interpret station models.

Part 1 – "Making the Invisible Visible"

Open the pdf version of "Making the Invisible Visible" from your Earth Science class page. (Or go to http://www.earth2class.org/er/students/Making_the_Invisible_Visible.pdf). Use the information to complete the attached chart. (If you do not have enough space, make your own chart.)

| Weather variable | Definition | Instrument |
|---|---|---|
| Air Temperature | | |
| Pressure | | |
| Wind direction | | |
| Wind speed | | |

| | | |
|---|---|---|
| Relative Humidity | | |
| Dew Point | | |
| Cloud (sky) coverage | | |
| Cloud type | | |
| Precipitation | | |

Explain how we measure conditions in the atmosphere above a location using a **radiosonde** and **weather balloon.**

Explain what kinds of information can be measured with **Doppler radar**.

Explain what information we can measure with a **weather satellite**.

Compare what we are measuring with a satellite's **visible sensor** and **infrared sensor**.

What does the National Weather Service need to **compile** all these data?

Today's "weather station model" for Englewood Date

_____

Go to www.weather.gov and select the local weather.

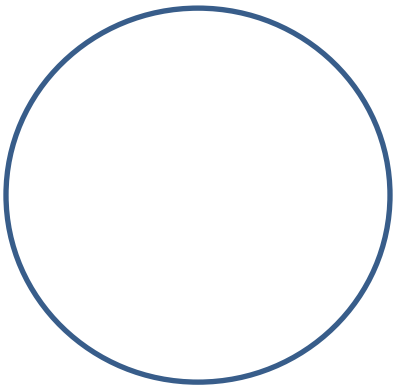
Record the information in the spaces provided here:

Temp _____ Dew Point Temp _____ Bar. Pressure _____

Wind direction _____ Wind speed _____ Sky cover _____

Other _____

Next, follow the guidelines to create a weather station model with these data.



Composition of the atmosphere:

Make a "pie chart" to show the relative percentages of the main gases in air.

Nitrogen ($N_2$) _____ %
Oxygen ($O_2$) _____%
Argon (Ar) _____ %
Carbon dioxide ($CO_2$) _____%