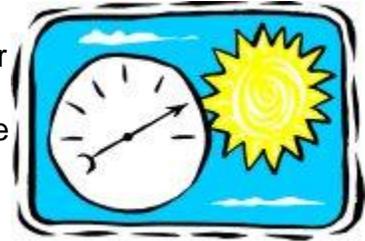


The Meteorologist's Tool Box

By Patti Hutchison



¹ Thermometer, barometer, anemometer: what are all these "ometers," and what do they tell us? Behind the scenes of your local TV station, meteorologists use many instruments to help give you your weather forecast. These instruments all measure different data about the weather.



² The most common instrument is called a thermometer. A thermometer contains a liquid, like mercury or alcohol, that expands (gets bigger) when it is heated. As the air temperature goes up, so does the liquid in the thermometer. These instruments are marked in units called degrees. In the U.S., we measure temperature on a scale called Fahrenheit. You may have seen temperature measured in Celsius in other countries such as Canada.

³ You probably have also heard of a barometer. This instrument measures air pressure. Like a thermometer, it also uses mercury, and is marked in units called millibars. A steady barometer means the weather will stay the way it is for a while longer. If the barometer is rising, you can expect the weather to change to fair. A falling barometer warns of coming precipitation or a possible storm.

⁴ Another "ometer" meteorologists use is called an anemometer. This strange- looking instrument has cups at the ends of 3 or more "arms" that catch the wind and spin. This is used for measuring wind speed.

⁵ Thermometers, barometers, and anemometers are simple tools that have been used for many years. Today there are more "high tech" instruments used to forecast the weather.

⁶ Have you ever heard of radiosondes? These are tiny sensors that are sent up in a large balloon. They measure temperature, air pressure, and humidity. Readings from the radiosondes are constantly sent back to weather stations by radio signal. These readings can help meteorologists track weather systems in order to make their forecasts.

⁷ Meteorologists use high tech radar to show if rain or snow is falling within a certain area. Radar uses radio waves that bounce off large raindrops back to antennae. This tells meteorologists how far away the rain is. Doppler radar is a special instrument that can also tell how fast the wind is blowing where it is raining. This lets them know how soon the rain will arrive at a different location.

⁸ You have probably seen pictures of clouds on the weather map. These pictures come from satellites orbiting the earth. The satellites take pictures and send them back to ground stations. These instruments are very useful for tracking larger areas of cloud cover which might produce rain or snow.

⁹ Did you know scientists could take the temperature of a cloud? They don't use a

thermometer; they use infrared imagery. An infrared image shows differences in temperatures as different colors. This helps a meteorologist know how high and how cold a cloud is. Because storms can come from very high clouds, this measurement can help scientists know if a thunderstorm will likely be produced. You have probably seen an infrared image of a hurricane or a severe thunderstorm on a weathercast. Usually they show lots of bright colors like red and yellow.

¹⁰ It takes a lot of different instruments, and many people to read and understand those instruments, to forecast the weather accurately. Knowing what goes on behind the scenes makes you appreciate all the hours of work that go into your nightly five-minute weathercast.

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Name _____  Date _____

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<p>1. A thermometer contains a liquid, such as _____ or _____, which expands when it is heated.</p> <p><input type="radio"/> A Helium; hydrogen</p> <p><input type="radio"/> B Alcohol; water</p> <p><input type="radio"/> C Water; carbon dioxide</p> <p><input type="radio"/> D Mercury; alcohol</p>	<p>2. Explain how a barometer and a thermometer are alike. How are they different?</p> <p>_____</p> <p>_____</p>
<p>3. An anemometer measures _____.</p> <p><input type="radio"/> A Air pressure</p> <p><input type="radio"/> B Air temperature</p> <p><input type="radio"/> C Wind speed</p> <p><input type="radio"/> D Rainfall</p>	<p>4. Radiosones are put into the air using a _____.</p> <p><input type="radio"/> A Satellite</p> <p><input type="radio"/> B Rocket</p> <p><input type="radio"/> C Balloon</p> <p><input type="radio"/> D Helicopter</p>
<p>5. How does radar help forecast the weather?</p> <p>_____</p> <p>_____</p>	<p>6. In an infrared image, differences in temperature show up as different _____.</p> <p><input type="radio"/> A Colors</p> <p><input type="radio"/> B Shades of gray</p> <p><input type="radio"/> C Symbols</p> <p><input type="radio"/> D Letters</p>
<p>7. Air pressure is measured in units called _____.</p> <p><input type="radio"/> A Degrees</p> <p><input type="radio"/> B Millibars</p> <p><input type="radio"/> C Ohms</p> <p><input type="radio"/> D Feet</p>	<p>8. The weatherman says the barometer is falling. What kind of weather can you expect?</p> <p>_____</p>

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