

Weather Merit Badge Prework

Hidden Oaks Nature Center

The Weather merit badge is a four-hour program. Scouts should bring a snack and plenty of water. We will spend a portion of the session outside, so please come prepared with appropriate footwear and dressed for the weather.

What to bring:

- Blue card, pen and pencil
- Appropriate clothing including closed toe shoes
- Snack and water.
- Prework.

Prework

2. Name FIVE dangerous weather-related conditions. Give the safety rules for each when outdoors. Discuss them with your family. Come prepared to share.

9. (a) Make ONE of the following instruments: wind vane, anemometer, rain gauge, hygrometer. *You may use the attached instructions from the SA Weather pamphlet as a guide or discover your own.* Keep a daily weather log for **one week** using information from this instrument as well as from other sources such as local radio and television stations, NOAA Weather Radio All Hazards, and Internet sources (with your parent or guardian's permission). *You may use the attached spreadsheet or your own table.* Record the following information at the same time every day: wind direction and speed, temperature, precipitation, and types of clouds. Be sure to make a note of any morning dew or frost. In the log, also list the weather forecasts from radio or television at the same time each day and show how the weather really turned out. **Bring your weather log to class along with a photo of your homemade weather instrument.**

10. Write a five-minute speech explaining the outdoor safety rules in the event of lightning, flash floods, and tornadoes. Come prepared to present to the class.

11. Find out about a weather-related career opportunity that interests you. Research what training and education are required for such a position. What responsibilities are required of such a position? Come prepared to share.

If you have any questions or concerns, please contact counselor Kelsey Jeffers at Kelsey.Jeffers@fairfaxcounty.gov or (703) 941-1065

Instrument Used (circle one): weather vane anemometer rain gauge hygrometer

[illegible]

Air Temperature

Air temperature is an important factor in weather, especially when associated with other factors such as humidity and pressure. It is measured with a *thermometer*.

The most accurate thermometers are the liquid-in-glass-tube type, containing either mercury or alcohol. The alcohol version is more appropriate for very cold places because alcohol freezes at a lower temperature than mercury.

A thermometer should be kept in the shade and away from wind and rain. The weather professional's thermometer is housed in a ventilated box raised above the ground and protected from the weather.

For most of the United States, -40 degrees Fahrenheit to 110 degrees Fahrenheit is a range of temperatures wide enough to cover most temperature observations. In Death Valley, California, however, the temperature once soared to 134 degrees, while at Rogers Pass, Montana, the temperature once plummeted to -70 degrees. The record low temperature in the United States was -80 degrees at Prospect Creek, Alaska.

Make a Cup Anemometer

Materials Needed

- ☐ New sharpened pencil
- ☐ 5 plastic foam cups
- ☐ Hole punch
- ☐ Straight pin
- ☐ 2 extra long plastic straws
- ☐ Felt marker
- ☐ Tape

Step 1—Mark the numeral “1” on one of the cups and set it aside.

Step 2—Set one of the unmarked cups on a work surface and punch four holes in it as shown. Be sure one set of holes is lower than the other set of holes.

Step 3—Carefully poke the pencil through the bottom of the cup.



Step 4—Push the pencil down so that it is below the holes and then thread the straws through the holes in the top of the cup to make a cross shape. Tape the straws in place.



Step 5—Raise the pencil up so that the eraser comes into contact with the crossed straws. Push the straight pin through the straws and into the eraser. Do not push the pin all the way in. The unit needs to be able to turn freely.



Step 6—Punch one hole each in the side of the other three unmarked cups and the marked cup, and mount them on the straw apparatus as shown. If necessary, add tape to better secure the cups to the straws.

Step 7—To determine wind speed, count how many complete revolutions the marked cup makes in one minute.



In most of the world, temperatures are measured in degrees Celsius, but in the United States surface air temperatures are measured and reported in degrees Fahrenheit. Water freezes at 32 degrees Fahrenheit, which is 0 degrees Celsius, and boils at 212 degrees Fahrenheit, or 100 degrees Celsius.

Make a Wind Vane

Materials Needed

- ☐ Aluminum baking dish, pie tin, or tray
- ☐ Sturdy wooden garden stake (at least 3 feet tall and 1 inch thick)
- ☐ 12-inch piece of wood about $\frac{1}{2}$ inch thick
- ☐ Nail (2 to 3 inches long)
- ☐ Electric or hand drill
- ☐ Thick metal washer
- ☐ Hammer
- ☐ Mallet
- ☐ Glue
- ☐ Small saw
- ☐ Scissors

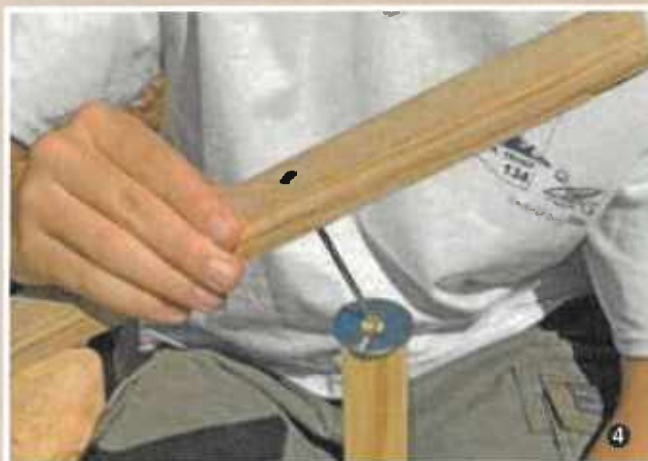


Step 1—Select a location for your wind vane. Then use the mallet to carefully drive the garden stake into the ground.

Step 2—Use the saw to cut a half-inch slot at each end of the 12-inch piece of wood.

Step 3—With an adult helping you, place the piece of wood on top of the stake, as shown, and drill through the wood and the stake. Use a drill bit that is slightly larger in diameter than the nail you will be using.

Step 4—Place the washer on top of the stake and insert the nail through the wood and into the stake. The wood should turn easily on the axis of the nail.



Step 5—Cut the head and tail of the arrow from the aluminum tray or dish using the pattern shown as a guide. Glue the head of the arrow into one slot in the piece of wood and the tail into the other slot.

