



## FACTivity

Sometimes, the temperature is too hot for people to feel comfortable outside. Urban forests might have an impact on how hot or cool you feel in the warmer months. The question you will answer in this FACTivity is: How does being in the shade affect how hot you feel?

The method you will use to answer this question is:

- 1** Get two thermometers. Place one thermometer outside under some shade, such as among tree branches. If there are no trees near you, place one thermometer outside under a bush or other vegetation where it will receive shade.
- 2** Place the second thermometer as close as possible to the first, but in a place where it will receive full sun. Leave the thermometers in place for at least 30 minutes before making your first observation.
- 3** Record the temperature registered by each of the thermometers.
- 4** Have one person in your class observe and record the temperatures at the beginning of the class period, another person observe and record the temperatures during the middle of class, and a third person observe and record the temperatures at the end of the class period.
- 5** Also observe and record the cloud conditions at the time each observation is made. Use the chart below as a guide for your recording.

Date and time	Temperature–In the shade (°F or °C)	Temperature–In the open (°F or °C)	Cloud conditions (1-5)

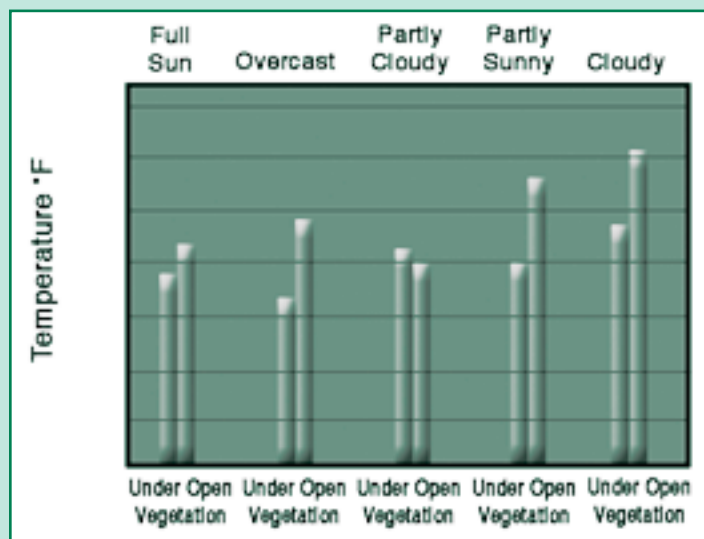
**6** Observe and record the temperature and cloud conditions for at least 9 school days (or almost 2 weeks). (How many observations will you have? Multiply  $3 \times 9$ .) On the 10<sup>th</sup> day, you will *analyze* your *data*. Use the following to observe and record cloud conditions:

Cloud conditions:

- 1 = Clear (full sunshine, sharp shadows, no clouds)
- 2 = Overcast (Hazy sunshine, fuzzy shadows)
- 3 = Partly cloudy (Mostly full sunshine, some clouds over the sun at times)
- 4 = Partly sunny (Mostly cloudy, some periods of full sun)
- 5 = Cloudy (No periods of sunshine)

**7** Separate your recorded data into categories based on cloud conditions. For example, place all of the 1's (full sun) together, all of the 2's together, all of the 3's together, and so forth.

**8** Create a bar chart for each cloud condition that occurred during your observation and recording. Bar charts are also called histograms. See the example below.



**9** After you have created all of your bar charts, compare the charts with one another. Is each cloud condition different? If so, how?

**10** Now compute the average of all of the temperature recordings taken in open conditions, and the average of all of the temperature recordings taken under vegetation. To calculate the average, add all of the temperature recordings and divide the total by the number of observations. Compare the two averages. From your *analysis*, answer the question posed at the beginning of this FACTivity.

Your results probably show a difference between the temperature recorded in the sun as compared with the temperature recorded in the shade. Were you surprised? Probably not, as you know that you feel hotter in the sun than you do in the shade. Did you know that in both cases the air temperature is actually the same? You feel hotter in full sun because the sun's *radiation* falls on your skin and heats it. The sun does the same thing with the thermometer. It feels cooler under trees because the shade keeps the sun's radiation from heating your skin.