

Probing Classroom Temperature to Identify Microclimates

By studying microclimates, students can begin to appreciate the many variables that contribute to the local and global climate. In this 5E learning cycle, pairs of students use temperature probes to map classroom microclimates. Students work together to collect temperature data from various places in the classroom and record it on a data sheet (see below).

Instructions

Engage: Present students with the big question: Does your classroom have climates?

Explore: Divide the room into a simple grid, nine quadrants horizontally and three layers vertically. Using meter sticks or tapes and arranging desks can help delineate measurement zones. Explain to students that they will be taking temperatures with a digital or good quality bimetallic thermo-probe to determine if a classroom is a homogeneous temperature 'box' (like a drinks cooler) or more complex. With 27 spots to measure in a typical classroom, have team obtain data in a few of the quads and have the groups pool their data for analysis. **Insert Safety Note!** Probe thermometers are usually sharp and must be handled carefully. Students getting ceiling data (if feasible) will need spotters if they are standing on chairs or sturdy desks.

Explain: Conveniently, doors, windows, and walls virtually guarantee that the box model is seriously flawed. Layering of air due to convection, drafts from doors and windows, and even body heat will insure variations in data. If your location has significant seasonal variation, the process can be repeated at different times of the year to show changes in air circulation and comfort zones between the warm and cold months. A typical class will

get several readings for each quad to average. This is also a good lead-in to a discussion of how much data is needed to draw a conclusion.

Extend: This exercise can be adapted for use around your building or playground. The activity usually raises excellent questions about whether the heating and cooling system is an anthropogenic (human caused) factor or a 'natural' one in the context of a school building. Once students are used to the idea of climate variability and the ways that climate factors can be measured, you can ease into the topic of long-term climate change.

Evaluate: The data generated from this activity can be used to talk about the 'societal' impact of variation in room climate vis a vis seating preferences. Another good discussion would be to talk about how efficient the energy use is in the classroom, based on the profile of the microclimate. Could students generate any ideas to alter the inputs to the room microclimate system?

Upper elementary students who have been following a weather/climate curriculum should be able to correctly read a thermometer and use proper units (metric preferred!). Students should also be able to differentiate between microclimate and general climate. Students should be able to identify human modulated temperature inputs as well as external ones in the classroom system. As a final assessment, students could devise their own model for examining their local playground microclimate and making suggestions for improving comfort.

Student Data Sheet

<http://www.lmnts.org/pdfs/ProbingTemperature.pdf>