

Closing Activities

As more and more states mandate standards and statewide testing programs, teachers increasingly feel they have to “Teach to the Standards.” At first you may feel that means there’s less room for projects like PASSPORT TO WEATHER AND CLIMATE. We believe, however, that P2K Modules offer uniquely powerful multidisciplinary learning opportunities that facilitate the teaching of both science facts and concepts while also allowing for a context-based application of scientific procedures and processes. Teachers who have used P2K have reported that their students develop higher order, integrated thinking skills, exactly the kind that are often *difficult* to obtain from textbooks but which *are* emphasized in statewide tests. Using P2K, teachers have also been able to cover a large number of both content and process standards, including some that cannot be realized through the typical science curriculum. Teachers tell us that positive student learning outcomes are obvious to them, but that often the regular assessment tools used to quantify the simple acquisition of facts are not adequate to measuring this more complex, higher order thinking. These Closing Activities, together with the rubrics already associated with the individual Activities, are designed to help you record and document the varied kinds of learning students have experienced. As with the Opening Activities, we suggest you pick and choose, adding and adapting to best fit your class experience.

Activity Z.1 “Facts and Fictions about Weather and Climate”, KWL Update and POST-TEST

If you had students work on Activity A.1, now’s the time to have them—and you—find out how many misconceptions about the weather have been revised, and how well new ideas and concepts have been acquired. Have students note new learnings in their WEATHERlogs and also update their KWL charts. Be sure to let them know what kind of review you plan, and any kind of marking scheme you intend to follow. If you used concept mapping, have students now revisit and complete them. As part of that process, have students review their WEATHERlogs, reflect on the Module and make some conclusions about what they’ve learned. Suggest they select from the various data sheets, writing assignments and other activities to create a WEATHER AND CLIMATE Portfolio with the “Best Of” their logs.

Some specific questions to prompt reflection:

- What do you now know about weather and climate that you did not realize before? (Ask for specific examples.)
- What do you now know about the people who study weather and climate? (Ask for comments on specific individuals seen in the videos, or read about online.) What are some of the reasons they became weather researchers?
- What are some of the tools now used to study weather and make forecasts?
- Do we know all we need to know about the weather? What are some of the key questions still outstanding?

If you used the PRE-TEST, now is, of course, the time for the POST-TEST. Again, we would expect significant increases in correct factual information and conceptual understanding to be apparent. Comparing the PRE- and POST-TESTs provides a quantitative description of what your students have gained.

Activity Z.2 “Weather Wise 2000”

Ben Franklin is supposed to have said you could be “weather wise or otherwise.” He was also knocked unconscious several times in his kite and lightning experiments and could easily have been killed, so he’s not exactly a model experimenter for students to emulate! However, his comments do serve to remind us that there’s always a question about what to do with what we know about the weather. Activity Z.2 provides a useful real-world wrap-up applying weather wisdom to social action.

Several NOAA publications have an interesting chart: the *cost* of hurricanes has grown throughout the 20th century while, thankfully, the *number of lives* lost has declined. By some estimates, a hurricane like the one which hit in 1926 might now cause some \$75 billion in damage (compared to the current “record” of \$30.5 billion from Andrew in 1992) and wipe a major coastal city like New Orleans off the map. The reason? More people now live in more expensive houses on the coast. And thinking about life in the center of the continent, some “weather sociologists” say that we may in fact not be able to increase greatly the lead time available to alert residents to oncoming tornadoes by any practicable technologies now known; instead they believe that changes in construction techniques and the inclusion of reinforced storm shelters in homes may prove most effective in saving lives. Public safety, in other words, goes beyond the science of weather and climate, though still requiring detailed knowledge of severe storms. One way of bringing this to life for students is to simulate the approach of a severe storm, and have teams of students research and report on precautions and actions that can and should be taken by various groups of citizens. The following teams provide one way to cover the range of responsibilities and information:

- WEATHER RESEARCHERS
- WEATHER FORECASTERS
- EMERGENCY MANAGERS
- LOCAL MEDIA (getting the word out to the public)
- SCHOOL ADMINISTRATION/PARENTS (specific precautions applying to students and their peers.)

Use Worksheet Z.2 to give each team of students a checklist of items to research and report on. The Suggested URLs provide a variety of extreme weather events. Choose what is appropriate for your region and what will excite and engage you students the most. Decide on a timetable for their reports, and a format that will work best for your class: a simulated “All Hands” meeting (paralleling the actual conference calls held twice daily from the National Hurricane Center), or preparing an emergency preparedness brochure for distribution in your community. Just like the NOAA/FEMA/Red Cross publications available online in pdf format, such brochures should have: (1) scientific background: key facts about the storm; (2) who’s at risk, where; (3) specific steps to take before a storm is imminent, and (4) actions to take when a storm approaches. Have students debate restrictions on building homes in hurricane or flood-prone regions. Should there be limits on freedom of individual choice? If your students have done Activity 4.2, “Hurricane Houses,” you might want to have them consider whether there

should there also be specific and detailed regulations about type of construction materials.

The Suggested URLs provided on the Worksheet provide links to the official publications of NOAA, FEMA and the Red Cross relating to the full range of weather emergencies.

Activity Z.3 “Writing Up a Storm.”

In the course of this Unit you may already have worked on Activity 4.1, or had students go online and participate in the “Great Emergency Preparedness PSA Contest.” If not, now’s a great time to consider doing these. Reflecting on severe weather events in their past, or considering how to prepare for future storms will have students focus on what they’ve just learned, and catalyze responses to the entire learning experience.

Activity Z.4 WEATHER*Expo

With all the hands-on activities, data collection and analysis, WEATHERlogs and other student work, you’ll likely have assembled quite an impressive collection of materials by the end of the unit. Having students share their accumulated knowledge about weather and climate with others is a powerful motivator to reflect upon and synthesize the learning outcomes of this Module. There are several options, all of which have been successfully implemented by P2K participants in previous Modules:

- a) students can present a “lesson” on some aspect of weather and climate to a younger class in your school or in your district. It might be fun to have them “Make Weather in Class”(Section 2), explaining to a more junior grade how clouds form and why lightning happens. This could be done as a whole class Activity, with students deciding together on content and presentation format, or with small groups of “student-teachers” interacting with small groups of “student-learners”. In any event, teaching others what you’ve learned is a powerful wrap-up experience.
- b) stage a WEATHER*EXPO at Parents’ Night, perhaps incorporating some of the “Weather and Climate Timelines,” “Doppler Radar in a Shoebox” and even a few “Twisters” in bottles. If your school’s a polling place on Election Day, consider a hallway display, to let the community know about the real-world learning their youngsters are experiencing. Document your Expo, and share it with other teachers online! Please send us digital copies of photos or press coverage resulting—and, indeed, copies of any materials resulting from these wrap-up Activities—to:

ptkinfo@passporttoknowledge.com

We hope you and your students have enjoyed PASSPORT TO WEATHER AND CLIMATE and the LIVE FROM THE STORM videos and online experiences, and that you’ll implement the project again next year and thereafter. PASSPORT TO KNOWLEDGE would like to hear back from you online with your comments and suggestions!