Outdoors With Technology

Going outside—whether for recess, recreation, or learning—is always exciting for students. Nature is God's second book, and we can learn much from the natural world He created. With that in mind, let me share with you some ways that technology can be used to enhance outdoor learning.

Come with me to an early elementary classroom where the students are studying habitats. This week's focus is on the migratory birds that return as spring creeps over the land. Teacher and students tramp through the woods, listening quietly for different songs and sounds of feathered creatures.[1] They carry along a tape recorder. (Yes, that is technology, too!) Each new sound is recorded for students to study and identify. Sound bites of robin, blue jay, and sparrow songs are captured for later use. Students who have bird feeders at home bring in recorded sounds of other birds.

In the classroom, the teacher divides the students into groups to collect data and information on the various birds. One of the students connects the tape recorder to the sound card in the computer.[2] Using a sound recorder,[3] the student creates a separate sound file for each bird song. The students then combine the sound files with pictures, original drawings, and facts about the life of each bird. They describe how God made each bird unique, learning as they do that they, too, are special and uniquely created. They organize the information into a computer presentation.[4] When the presentations are finished, the class invites the families of the church to a special Sabbath afternoon program, where they learn about God's special creation.

Come with me again as we travel to an Enriched Biology class in Minnesota.[5] The students are surveying their local creek as part of the Great River Project in which many high schools join together to collect data about the Mississippi River and its tributaries. The class takes a field trip to study the creek. One group of students measures the creek bed by stretching a rope across the stream and measuring the depth at half-meter intervals. Then

Janine Lim

they move down the stream one meter and repeat the measurements. Data is called out to a student on the bank, who writes the figures on the screen of an eMate.[6] The eMate converts this into numbers in a spreadsheet. Other students measure and test the aquatic plants, dissolved oxygen and biochemical oxygen demand, the pH, turbidity, and other indicators of the health of the creek.

Back in the classroom, the students work in groups of three or four. They connect the eMate to the computer and transfer the spreadsheet data to a program called NIH-image,[7] which creates a three-dimensional color topographical map of the creek bed. The students calculate an average based on two profiles of the river, and using water velocity information, calculate the output of the river. With their teacher, they discuss the data they collected and the effect of the variables on the organisms living in the creek. They then share data with other schools participating in the project. The students are assessed on their planning, cooperative activities, data and accuracy, written report, oral presentation, and reflective journals on the experience.

For our third scenario, we travel to a multigrade classroom in New Hampshire.[8] Following a noisy recess, the students sit quickly on the playground and watch for the birds to return. They count birds of various species. That evening, a little girl does her homework outdoors. She counts the bats flying past in a certain amount of time so she can share the data the next morning with her class. A group of students measures the diameter of trees in the woods beside their school, and near their homes. These children are participating in three network science projects called Batnet, Birdnet, and Treenet that require hands-on science participation and data collection. But the power of the project comes from sharing the data with other schools via the Internet.[9] Using the larger data sample collected by many schools, the students can look for patterns and trends, and then make hypotheses and work like real scientists. As their teacher observed, the students have "acquired skills in measurement, use of models, map reading, and graphing, and have learned about temperature and cause and effect."[10]

In these scenarios, students explored the outdoors to learn about the world God created. They worked together to solve problems and

present their information. And technology was an important tool to help them to accomplish their goals. ✐

Janine Lim is the Instructional Technology Consultant at Berrien County Intermediate School District in Berrien Springs, Michigan. She works with Adventist schools as well as other public and private schools. She can be reached at her World Wide Web page: http://www.andrews.edu/~freedj/ or by E-mail: freedj @ andrews.edu.

REFERENCES

1. Students could also collect a broader range of sounds: those in the habitat under study.

2. This can be done using any computer with sound capabilities. Suppliers like Radio Shack sell cables that connect the tape player's line out or headphone jack to the computer's line in.

3. In Windows 95/98, you can find the Sound Recorder under Start, Programs, Accessories. You can record up to a minute in this program.

4. The presentation could be done using HyperStudio (www.hyperstudio.com), Microsoft Power Point (www.microsoft.com), Corel Presentations (www.corel.com), or even Kid Pix Studio (www.broderbund.com).

5. Data for this scenario is taken from a video produced by North Central Regional Educational Laboratory as part of a training class called Learning With Technology. Additional information about the class project is available at http://www.cards.anoka.k12.mn.us/projects/grp/mrp.html.

6. An eMate is a low-cost durable computer made by Macintosh. They are now selling their last supplies and not creating any more of the product. However, this could be done with any of the other Personal Digital Assistants that collect spreadsheet data. More info about using the eMate can be found at: http://www.apple.com/education/LT Review/fall97/main2/default.html.

7. This software is free for the Macintosh and can be found at: http://rsb.info.nih. gov/nih-image/. For more information or for similar Windows 95/98 software, visit the Center for Imaging Processing in Education at http://www.cipe.com/.

8. Diane Lonergan, "Network Science: Bats, Birds, and Trees," _Educational Leadership_ 55:3 (November 1997), pp. 34-36. A similar article was published at http://www.classroom.com/staff/tmc/2.htm.

9. Other projects like this can be found at http://www.remc11.k12.mi.us/bcisd/classres/projtrip.htm.

10. Lonergan, p. 35.