# Inquiry turns naturally curious students into scientists

By Anne Tweed with Heather Hein

A group of 10- and 11-year-old children are standing on a hot beach, digging their toes into the sand and squinting into the sun, when one of them wonders aloud, "Will more light reflect on the beach down by the water's edge or up by the beach grass?" With this question in mind, the students scatter across the beach to collect data. Later, they will return to their fifth-grade classroom to analyze and discuss their findings to determine why the light reflected the way it did.

Not all of us are lucky enough to live so close to a beach, but this activity demonstrates how the pedagogical method of inquiry should work in any science classroom: Students working together on a hands-on activity and discovering scientific concepts on their own.

By nature, kids are curious and want to learn about the world around them by asking lots of "why" questions. However, when they start school, they are often encouraged not to ask questions, but rather to receive information. In a science classroom, though, asking and answering questions means that students are not only engaged in science but also thinking like scientists.

Developing a student's ability to think scientifically is the key to success in science. Scientists have a good sense of not just what they know but also what they don't know.

To get students to think about what they don't know, ask questions about it, and learn how to develop explanations using evidence, teachers must model and scaffold the skills of scientific inquiry. The ultimate goal is for students to take control of their learning by being able to monitor their thinking and their progress in learning science concepts.

## Why ask "why?"

Though researchers are still working to prove the link between inquiry and increased student achievement, teachers of science know that inquiry works in helping their students understand science better. According to Marlene Thier, "Teachers who regularly use guided-inquiry science materials in their classrooms report that students understand science concepts more deeply and thoroughly than students who learn through more traditional methods" (2002, p. 27).

It makes sense to science teachers that students learn better by doing—and doing with others—rather than reading about it or hearing a lecture. When students work like scientists, they use language to organize, recognize and internalize the concepts and information they encounter. Because students ask questions and discuss their results, inquiry activities help students engage in explanatory talk that promotes understanding and helps to make sense out of what seems mystifying. Also, inquiry promotes higher order thinking skills by preparing students to successfully defend their findings before an audience of critics (Layman, Ochoa & Heikkinen, 1996). In short, inquiry motivates students, challenges their thinking, and makes them responsible for their own learning. Why would we ask for anything more?

The next two pages provide an example of an inquiry-based science lesson plan that teachers can use to help their students think and ask questions like scientists. CS

## References

Layman, J., Ochoa, G., & Heikkinen, H. (1996). *Inquiry and learning: Realizing science standards in the classroom.* New York, NY: National Center for Cross Disciplinary Teaching and Learning.

Thier, M. (2002). *The new science literacy: Using language skills to help students learn science*. Portsmouth, NH: Heinemann.

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