

# Observation as a Springboard

by Betty Mott

In my third-grade class, I use observation as a springboard for the development of the inquiry process. The school year begins with several lessons that help students develop their observational skills. Children start by doing various activities that involve close observation of different kinds of objects. They may observe something as familiar as a cracker, for example, or something that is less familiar to them, and then have the class match their description with the object.

Each child begins the year with a large composition book. Recording their observations in this “science journal” leads to the questions that drive students to craft their own investigations. These investigations ultimately lead to a meaningful understanding of the content being presented. The journal becomes the place for documenting observations, writing questions, and suggesting inquiries. These journals become part of each child’s portfolio, which is shared with parents during conference periods, and then become my source of evidence as to whether science standards have been met.

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## Learning how to observe

Throughout the school year, I guide my class through a number of activities designed to develop their observational skills.

Students begin by making miniature ecosystems from clear, two-liter soda bottles. First, we cut off the top five inches of the bottle. Then students fill the bottoms of their bottles with an inch or two of small pebbles, a sprinkle of aquarium filter charcoal, three to four inches of garden soil, and two or three backyard plants such as ferns, baby tears, and grasses. Water is added until the soil is moist, and the



*Students from Betty Mott’s class at the Tam Valley School Creek.*

cut-off top of the bottle is put back in place to cover each little terrarium.

When the terrariums are ready, they are placed on the windowsills so that they get enough light. Then students draw pictures showing what the newly-planted ecosystems look like. As the school year progresses, students continue observing and recording changes in their terrariums. They observe the water cycle, seasonal activity, and plant cycles. As some plants die and others sprout from seeds hidden in the soil, questions begin to appear in student journals.

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## The value of creative questioning

Students should have many opportunities to practice observations in order to come up with the questions that I call “wonderments.”

Once a week, my students have the opportunity to write their “wonderments” in their science journals. They begin with the date and then write a question about something they’ve observed. For example:

Why do the fish  
in this creek  
seem to prefer  
muddy water to  
clear water?

“I wonder why when you see someone in the room yawn, you yawn?”

“I wonder why snails leave a slimy trail?”

“I wonder why the plastic cup sticks to the plastic plate when the cup and the plate are wet?”

“I wonder why the pH of the creek is 9 today?”

Wonderments can come from anywhere, although many come from a student’s experiences during science class.

After writing down the question, the student draws a detailed picture representing the question, followed by a possible explanation. Students often go back and change their explanations after having many experiences messing about or collecting evidence. They begin to see that a question is a bridge between what they know and what they don’t know, or want to know.

## Creekside investigations

For my third-graders, all this observation, questioning, and recording of information leads to a year-long study of a nearby creek. Because it’s a seasonal body of water, it offers a lot of dramatic changes for students to observe. It’s also a great place to write poetry and to draw.

Our study begins with a “Meet-the-Creek” trip. Students conduct a few simple tests, collect data, establish “creek manners,” and become year-long stewards of the creek. At first I model what needs to be done, then they record the weather, the colors they see, air temperature in the sun and shade, and the pH of the water. Students also draw at least two of the plants and animals they notice.

On our return from a creek visit, one student, designated as the “debrief,” calls on the other students to name or describe

### OBSERVATION: TAM VALLEY SCHOOL CREEK

#### Plant life



#### Animal life



These drawings are part of Rafi’s observations which also included weather conditions, air and water temperatures, pH, an inventory of litter and some notes about changes since the last visit: “Dirtier water, less animal life, high pH, plants are not as alive.”

the plants and animals they noticed. This information, along with weather conditions, Polaroid camera shots, information about the pH of the water, and any other data collected, is entered on a computer and becomes part of our Web site and each student's individual creek journal.

With each visit, the students become more proficient and capable. More questions are written down, and more tests and responsibilities are added to carry out. Students carry their own test supplies and have small white dry-erase boards to record their results. They share the data they collect, putting all the information on their observation forms, even if they did not conduct a particular test themselves, so each has an overall picture of the creek.

Once the rains start and the creek begins to flow, other tests are added so that everyone in the class is working on a test and has a job. It is important that each student have a responsibility. When all the children are actively involved, you do not have to concern yourself with discipline, as the inquiry itself keeps them interested.

The creek study takes a new direction every year. Each class has its own personality, and the children raise different questions, so each inquiry is different. Students decide the direction of the year-long creek study themselves.

The first year, for instance, we monitored temperature, weather, plants, animals and change. The second year, students wrote poems and drew creek pictures with pastels. These poems and drawings were published in a Tam Valley School Creek Poetry Collection, and shared at a school board meeting.

This year, our third year of this investigation, began with questions from the students: "How can we keep the creek clear of litter?" "What can we do about all the dog litter that is increasing at such an alarming rate?" "Where do the spiders go in the winter?" Questions about the pH level led to an investigation about pH and how it affects the plant and animal life of the creek. More questions came forward, along with the need to collect and discuss the evidence observed at the creek.

Excitement filled the air after the first rains when the students observed some



*Creek observations*

dramatic changes. The pH returned to 6.7, but there seemed to be no fish in the creek. Where had all the fish gone? Why had they disappeared when there was more water now than before? Why do the fish in this creek seem to prefer muddy water to clear water? All of these questions have become valuable starting points for our creekside investigations.

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## Reflection

Three years into this process, I have found that observation activities provide a strong foundation for beginning the inquiry process in the classroom. This process gets kids directly involved in their learning. It motivates them to look for answers, solve problems, and formulate their next steps in learning. It doesn't happen overnight, and there have been both successes and failures along the way. It requires that a teacher be willing to take learning risks along with his or her students, and to provide the structure and tools necessary to assure accountability for learning while meeting state and local standards. ✍

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