

Tips for Inquiry Science

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A few days ago I facilitated a professional development session on a kindergarten inquiry curriculum. As with all facilitated workshops, I asked the participants what they expected to get out of the day's session. One kindergarten teacher, new to the science curriculum, asked how I managed the classroom for science instruction. She noticed and commented on the way I organized the science materials in plastic bags for training. Her question stumped me. How was I going to address her concern by the end of the day since it took me thirty years to figure it out for myself? How do teachers organize their classrooms for inquiry instruction? What successful strategies do teachers use?

Managing hands-on inquiry science can be a challenge, especially if a teacher is just finding out how to shift away from conventional methods of teaching science to a more active, hands-on approach. With inquiry science, students become the center to problem-solving investigations while the teacher manages and facilitates the classroom. Effectively managing inquiry science can mean the difference between chaos and real learning.

In my years of teaching science, I have discovered many effective strategies that teachers can implement with their own students. Rossman (1993) suggests six guidelines that closely mirror my own classroom.

The first guideline in managing inquiry science is to *plan and prepare*. Nothing is worse than to have twenty kindergarteners waiting for the teacher because he/she forgot to bring the live caterpillars to class. Before engaging students in their science roles, I prepare and organize all materials before class begins. Planning and preparing can mean putting all science materials and equipment into plastic bags or bins. I also review science content and any background information I would need for instruction.

The second guideline is to *create problem intrigue*. What can a teacher do to motivate students in the science content introduced? Rossman states, "Problems to solve and questions to investigate are at the heart of inquiry" (p. 36). I brought realia to the classroom in the form of caterpillars, a wasp nest, a bird's nest, etc. Students asked intriguing questions that they were able to investigate as I facilitated the inquiry lesson.

The third successful guideline is to *give students responsibility*. They should have opportunities to explore and investigate science materials and equipment since these explorations often lead to problem-solving questions. This is also one of the most difficult strategies to implement since inquiry science is often "noisy and messy," something traditional methods do not always

embrace. As a facilitator to my students' learning, I have found that letting students work independently together actually enhances their science learning.

To manage inquiry science is to take on the role of a facilitator by *offering feedback and guidance to students*, the fourth guideline. I ask students guided questions. While I always recognize and value student-driven questions, I also recognize the need to address specific learning concepts through scaffolded questioning techniques. We use both student-driven and teacher-guided questions.

Debriefing student work through classroom discussions is an important guideline to successful inquiry instruction. These discussions provide opportunities for students to learn from one another and allow teachers to assess how their students are processing science content. I provide for both large and small group discussions. Student ideas are then recorded on chart paper, which we use as a concept wall. The concept wall serves as a way to validate student thinking and serves as a reference resource. When we observed butterflies, we often reviewed the charts for science information.

The final guideline in managing inquiry instruction is to *anticipate, prevent, monitor, and adapt to problems* that might arise during instruction. This is probably the most useful strategy but, perhaps, the most time-consuming strategy. It took me years to understand that inquiry science is an on-going process that continuously changes and cannot be taught in mastered steps. I had to experience many successful and failed classroom investigations before I realized my management strategies were viable.

For a teacher trying to implement a more hands-on inquiry approach to science instruction, the best advice I can offer is that nothing is the same when engaging students in science. Just as students discover something new, teachers will also discover that managing inquiry is a process.

Rossman, A.D. (1993, September). Managing Hands-on Inquiry. *Science and Children*, 35-37.

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