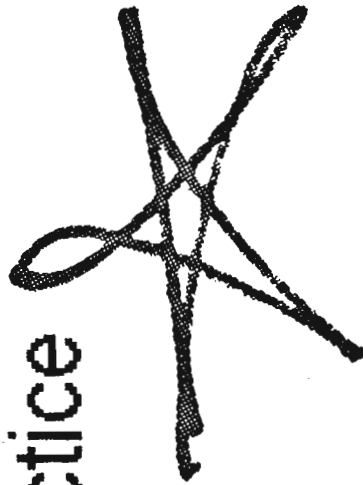


# **Schools in the Middle**

**Theory Into Practice**



**Gregory Grambo**

**Assessing Students In A  
Hands-On Science Classroom**

Schools In The Middle:  
Theory Into Practice

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# Toward Critical Thinking

## Assessing Students in a Hands-on Science Classroom

Gregory Grambo

Each year, we move more and more toward hands-on science education and farther away from rote learning. It is more important for students to learn how to use the periodic chart, understand the information it contains, and know where to find a copy when they need it than to simply regurgitate the elements and their symbols.

This move toward critical thinking presents a problem, however: How do we assess students' knowledge and ability? During the past 13 years, I have used a variety of assessment methods in my hands-on science classrooms.

In biology, I give practical exams on such topics as using the microscope. I ask students to prepare a slide and use a microscope. I also ask students to show me that they can measure, mix, and heat objects to discover their properties.

As students are conducting experiments, I move from small group to small group, asking questions and mentally noting responses and reactions.

My students also keep a lab notebook in which they write their experiments in a scientific method format. This notebook helps them organize their thinking, but while the format provides some structure, I also encourage the students to write freely about their observations and what they uncover during the experiments.

### In Touch with Students

Each week, I review more than 150 student lab notebooks, which keeps me in touch with my students' thinking processes and their understanding of the material. I look at their thoughts, not their grammar and spelling. This review



also gives me the opportunity to keep in touch with each student on a more personal basis. I write personal notes in their notebooks and direct or re-direct their attention to specific areas.

Throughout the school year, students are required to research, build, and present a science project to their peers. Students grade each other on their ability to present projects in clear, concise language and on the effort they put into each presentation.

As a class, we then review all presented projects, talking about each project's good and bad points. This makes students part of the learning process, empowers them, and rewards them for active learning.

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