INTRODUCTION

Science Process Assessments for Elementary and Middle School Students are easy-to-administer paper/pencil tests designed to measure the following 13 science process skills, as identified in *A Recommended Science Process Skills Competency Continuum for Grades K-8*:

1. Observing
2. Classifying
3. Inferring
4. Predicting
5. Measuring
6. Communicating
7. Using Space/Time Relations
8. Defining Operationally
9. Formulating Hypotheses
10. Experimenting
11. Recognizing Variables
12. Interpreting Data
13. Formulating Models

In a pencil/paper, multiple-choice format, test items engage students in problem-solving situations which require them to apply an appropriate process skill to answer each question. In a large or small group setting, tests can be administered to students in a 40-50 minute class session. Most often, teachers use "scantron" answer sheets for students to record their responses. Scantron sheets are then scored accordingly, providing teachers with the results of the test administration as well as preparing them to plan their instruction in science.

HOW SCIENCE PROCESS ASSESSMENTS ARE BEING USED

- **Pre/Post Test** - Teachers administer the Science Process Assessment for Elementary or Middle School Students at the beginning of the school year to determine
strengths and weaknesses of students in each of the identified skills. At the end of the school year, teachers administer the tests again to find out how students' scores have improved after science instruction has occurred.

- **Diagnostic** - Teachers administer the Science Process Assessment for Elementary or Middle School Students at the beginning of the school year, determine where their students need assistance with process skills, then plan lessons and laboratory activities designed to overcome their deficiencies.

- **Placement into Advanced Science** - Teachers use the Science Process Assessment for Middle School students as one of four criteria to place students into Advanced 9th Grade Science. The other criteria include: the State Achievement Test; a personal interview; and current science grades.

- **Placement into Science Competition** - Teachers use the Science Process Assessment for Middle School as the major criteria to select students to participate in Science Olympiad at the local level. As one teacher testifies: "If kids score high on the Middle School Test, they do well at Science Olympiad."

- **Preparation for State Tests** - Teachers use the Science Process Assessment for Elementary or Middle School to help students prepare for the designated state Achievement Tests such as the Stanford Achievement Tests (SAT 9), Metropolitan Achievement Tests (MAT), California Achievement Tests (CAT), and others.

- **Research Studies** - Graduate students at several universities have used the Science Process Assessment for Elementary and Middle School Students in research studies related to testing and assessment, as well as in seeking information relevant to the science process skills.

- **Pre-Service Educators** - Teacher Education Programs, in preparing pre-service educators in the "teaching of elementary science," find the Science Process Assessment for Middle School particularly helpful in determining "if" and "how well" students have mastered the science process skills.

- **Career Guidance** - Researchers are piloting the use of the Middle School Test as a means to identify students who demonstrate strength in science and technology, leading to a possible career in engineering.

---

**BACKGROUND**

The Science Process Assessment for Elementary Students was developed in 1986 and revised in 1995. It yields a reliability coefficient of .82 and has been used with students in grades three, four and five. The Science Process Assessment for Middle School Students was developed in 1994 and yields a reliability coefficient of .88. This test has been used with students in grades six, seven and eight.

The Far West Laboratory for Educational Research and Development at Stanford University used the Science Process Assessment for Elementary Students to test the process skills of approximately 5000 students in 37 inner-city schools. Using a pre/post assessment format, results from the Far West Lab study demonstrated the validity of this test by providing data that it successfully measured achievement of "an array of scientific reasoning skills of fourth and fifth grade students."

---

**DISTRIBUTION**

The Science Process Assessments for Elementary and Middle School Students have been administered to thousands of students throughout the United States. It has been used in
Alabama, Arizona, Arkansas, California, Connecticut, Illinois, Indiana, Kentucky, Maryland, Michigan, Minnesota, Missouri, New Jersey, Louisiana, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, Tennessee, Virginia, West Virginia, and Wisconsin. Evidence from the data collected has demonstrated that both tests yield high reliability coefficients and are considered to be valid assessment tools. Also, both assessments have been used by United States Department of Defense Schools within school science programs in Italy, Belgium, and Germany. Most recently, the University of Pretoria in South Africa is piloting the use of the Middle School Test as a means to identify students who demonstrate strength in science and technology, leading to a possible career in engineering.

INFORMATION LINKS

- Features of the Elementary Test
- Features of the Middle School Tests
- Pricing and Ordering Information
- Smith and Welliver Educational Services

For additional information, please email ksmith@penn.com

This page created with Netscape Navigator Gold