

Semester III

Unit IV

Topic - Assessment in Science Learning

By-

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The assessment standards provide criteria to judge progress toward the science education vision of scientific literacy for all. The standards describe the quality of assessment practices used by teachers and state and federal agencies to measure student achievement and the opportunity provided students to learn science. By identifying essential characteristics of exemplary assessment practices, the standards serve as guides for developing assessment tasks, practices, and policies. These standards can be applied equally to the assessment of students, teachers, and programs; to summative and formative assessment practices; and to classroom assessments as well as large-scale, external assessments.

This chapter begins with an introduction that describes the components of the assessment process and a contemporary view of measurement theory and practice. This introduction

is followed by the assessment standards and then by discussions of some ways teachers use assessments and some characteristics of assessments conducted at the district, state, and national levels. The chapter closes with

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two sample assessment tasks, one to probe students' understanding of the natural world and another to probe their ability to inquire.

In the vision described by the *National Science Education Standards*, assessment is a primary feedback mechanism in the science education system. For example, assessment data provide students with feedback on how well they are meeting the expectations of their teachers and parents, teachers with feedback on how well their students are learning, districts with feedback on the effectiveness of their teachers and programs, and policy makers with feedback on how well policies are working. Feedback leads to changes in the science education system by stimulating changes in policy, guiding teacher professional development, and encouraging students to improve their understanding of science.

The assessment process is an effective tool for communicating the expectations of the science education system to all concerned with science education. Assessment practices and policies provide operational definitions of what is important. For example, the use of an extended inquiry for an assessment task signals what students are to learn, how teachers are to teach, and where resources are to be allocated.

Assessment is a systematic, multistep process involving the collection and interpretation of educational data.

As science educators are changing the way they think about good science education, educational measurement specialists are acknowledging change as well. Recognition of the importance of assessment to contemporary educational reform has catalyzed research, development, and implementation of new methods of data collection along with new ways of judging data quality. These changes in measurement theory and practice are reflected in the assessment standards.

In this new view, assessment and learning are two sides of the same coin. The methods used to collect educational data define in measurable terms what teachers should teach and what students should learn. And when students engage in an assessment exercise, they should learn from it.

This view of assessment places greater confidence in the results of assessment procedures that sample an assortment of variables using diverse data-collection methods, rather than the more traditional sampling of one variable by a single method. Thus, all aspects of science achievement—ability to inquire, scientific understanding of the natural world, understanding of the nature and utility of science—are measured using multiple methods such as performances and portfolios, as well as conventional paper-and-pencil tests.