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Preface

Most states have developed their own science education standards and, in numerous cases, have begun to assess student achievement of these standards. These actions are, for the most part, a direct response to the publication of national standards for science education by both the American Association for the Advancement of Science (AAAS, 1993) and the National Research Council (NRC, 1996). Many of these science standards are inquiry-based, robust, and comprehensive, and they require complex responses that do not have one single "best" answer. Therefore, judgment-based evaluations will be necessary to assess many of these standards.

As a result, the need has emerged among science educators for assessment and evaluation tools that will complement and extend traditional selected-response test items. In fact, many classroom teachers have requested such tools for some time as they implement and assess student progress on state-mandated standards. The assessment tools within this packet were designed to begin to address this need. Each has been field-tested and revised for many years with elementary, middle, and high school students in Grades K-12. Science educators are encouraged to use the tools as they currently exist or revise them as needed. Teachers and students alike can use them for both formative (embedded) and summative assessments. Ideally, students should be able to view the tool(s) prior to, during, and after the required task is completed. Then, after the student has completed the task and checked the performance list or rubric, he or she may wish to revisit the task to make needed revisions. Finally, the classroom teacher may want to provide the student with a score or grade, make comments to highlight strengths, and suggest additional improvements. The recording and reporting format of achievement for each tool contained within is consistent with this use.

All of the tools within this publication are generic (non-task specific) in design. This means they can be applied to a wide variety of situations in science education grades K-12 without major modifications being necessary. Although the tools are generic, they can serve also as a foundation for defining the criteria for constructing task-specific tools.

Three different versions of assessment tools are included within this publication: performance lists, holistic rubrics, and analytic rubrics. However, not all three forms are available for every performance. Performance lists are the easiest version for teachers to design and for students to use. In addition, the performance list defines the criteria for the task and, therefore, is the foundation for creating both holistic and analytic rubrics. Each version of the tools is written in language that is appropriate for both students in Grades K-12 and teachers.