

Evidence of Student Learning in the Teaching of Science Portfolio Rubric

This rubric presents the performance standards for Middle Childhood and Secondary Science Education candidates seeking to earn a recommendation for licensure in science. In order to earn recommendation, a candidate must achieve a minimum of a basic rating for each standard. The rubric is intended to evaluate a portfolio that is presented in an interview format to a review committee.

NSTA Assessment 5:

1. This rubric is used to meet NSTA Assessment 5. It is in the form of a portfolio that is presented in an interview format to a review committee.
This assessment is usually presented to a Portfolio Review Committee. The Committee could include a science educator, scientist or content specialist, and university supervisor. Candidates will be required to meet with the Science Portfolio Review Committee and the Committee will evaluate the candidate's performance before recommending the candidate for licensure in science. Specific requirements for emerging, basic and professional ratings are laid out in this document.
2. Evidence of learning beyond memorization of concepts, principles, and theories may include summaries of students' gain scores in the form of graphs, charts, and/or tables
3. Gain scores can be drawn from a candidate's teaching, previous field experiences or other K-12 teaching experiences. Student gain scores could include pre and post data as well as alternative assessments. When alternative assessments are included in the portfolio, the candidate must present clear, unambiguous standards for scoring the assessment.

Student Learning

Student learning for this portfolio is a demonstrable change in student understanding of content, reasoning, and/or process skills (as defined by the NSTA standard). Evidence of student learning beyond memorization may include summaries of student gain scores in the form of graphs or tables. Student gain scores could include pre and post data as well as alternative assessments. If alternative assessments are used, the candidate must include criteria for scoring the assessments.

Standard	Unacceptable	Acceptable	Target
A. The candidate is able to successfully convey to students the major science concepts, principles, theories, laws, and interrelationships of their fields of licensure.	<p>The data show that K-12 students' have not positively changed their understanding of major science concepts, principles, theories, laws, and interrelationships as a result of instruction by the candidate.</p> <p>Student knowledge of science does not go beyond memorization.</p> <p>Candidate did not collect, organize, and analyze data in a manner that could be interpreted.</p>	<p>The data show that K-12 students' understandings of major science concepts, principles, theories, laws, and interrelationships have positively changed as a result of instruction by the candidate.</p> <p>Content learning was reflected in a level of understanding beyond memorization.</p> <p>Candidate collected, organized, and analyzed data in a manner that could be interpreted.</p>	<p>The data show that K-12 students' understandings of major science concepts, principles, theories, laws, and interrelationships have positively changed as a result of instruction by the candidate. The students' have made a change in their understanding and are able to reflect on their own changes in understanding.</p> <p>Content learning was reflected in a level of understanding beyond memorization.</p> <p>Candidate collected, organized, analyzed and interpreted data.</p>
C. Nature of Science (as defined in the National	The data show that K-12 students' have not positively changed their understanding of the nature of science as a result of instruction by	The data show that K-12 students' understandings of the nature of science have positively changed as a result of	The data show that K-12 students' understandings of the nature of science have positively changed as a result of instruction by the candidate. The students' have made a

Standard	Unacceptable	Acceptable	Target
Science Education Standards)	<p>the candidate.</p> <p>Student knowledge of science does not go beyond memorization.</p> <p>Candidate did not collect, organize, and analyze data in a manner that could be interpreted.</p>	<p>instruction by the candidate.</p> <p>Content learning was reflected in a level of understanding beyond memorization.</p> <p>Candidate collected, organized, and analyzed data in a manner that could be interpreted.</p>	<p>change in their understanding and are able to reflect on their own changes in understanding.</p> <p>Content learning was reflected in a level of understanding beyond memorization.</p> <p>Candidate collected, organized, analyzed and interpreted data.</p>
<p>D. The candidate engages students effectively in scientific inquiry and investigations.</p> <p>See 2003 NSTA Standards' pages 17-19.</p>	<p>Provides minimal to no evidence that students develop concepts and relationships from their observations, data, and inferences as a result of inquiry-based instruction by the candidate.</p> <p>Student knowledge of science does not go beyond memorization.</p> <p>Candidate did not collect, organize, and analyze data in a manner that could be interpreted.</p>	<p>Provides evidence that shows students observe, ask questions, design inquiries, and collect and interpret data in order to develop concepts and relationships from empirical experiences as a result of inquiry-based instruction by the candidate.</p> <p>Content learning was reflected in a level of understanding beyond memorization.</p> <p>Candidate collected, organized, and analyzed data in a manner that could be interpreted.</p>	<p>Provides multiple authentic and creative examples that demonstrate students observe, ask questions, design inquiries, and collect and interpret data in order to develop concepts and relationships from empirical experiences as a result of inquiry-based instruction by the candidate. The students' have made a change in their understanding and are able to reflect on their own changes in understanding.</p> <p>Content learning was reflected in a level of understanding beyond memorization.</p> <p>Candidate collected, organized, analyzed and interpreted data.</p>
<p>E. The candidate engages students successfully in the analysis of problems, including considerations of risks, costs, and benefits of alternative solutions; relating these to the knowledge, goals and values of the students. See 2003 NSTA Standards p. 19-21</p>	<p>The data show that K-12 students' have not conducted inquiries into the factual basis of contemporary science- and technology-related issues of interest to the general society as a result of instruction by the candidate.</p> <p>Student knowledge of science does not go beyond memorization.</p> <p>Candidate did not collect, organize, and analyze data in a manner that could be interpreted.</p>	<p>The data show that K-12 students' analyze problems; consider risks, costs, and benefits of alternative solutions; and relate science and technology issues to the lives of students as a result of instruction by the candidate.</p> <p>Content learning was reflected in a level of understanding beyond memorization.</p> <p>Candidate collected, organized, and analyzed data in a manner that could be interpreted.</p>	<p>The data show that K-12 students' analyze problems; consider risks, costs, and benefits of alternative solutions; and relate science and technology issues to the lives of students as a result of instruction by the candidate. The students' have made a change in their understanding and are able to reflect on their own changes in understanding.</p> <p>Content learning was reflected in a level of understanding beyond memorization.</p> <p>Candidate collected, organized, analyzed and interpreted data.</p>

Summary of Student Learning in the Teaching of Science

Candidate Name	Term/Year
Date of exit interview	Licensure Area(s)

Please note on the form above the appropriate evaluations.

Standard	Evaluation (Points)	Evidence used and Comments
A. Science content		
C. Nature of Science		
D. Inquiry		
E. Issues		