

**APPENDIX A**

**EQUAL ACCESS TO LANGUAGE AND SCIENCE (EQUALS) RUBRIC**

<p><b>Criterion 1: A Focus on Three-Dimensional Learning</b>                  How well does the science teaching promote three-dimensional learning? How apparent are each of the three dimensions in the teacher's approach?  <i>Indicators: Teaching includes (1) ensuring that the three dimensions to be easily identifiable, (2) developing the dimensions over a course of a series of lessons that coherently build together, and (3) blending of the three dimensions in an authentic (non-superficial) way, essential to carrying out the lesson or series of lessons.</i></p>			
<p><b>Level 1</b>                  The teaching includes each of the three dimensions; by the three dimensions working together and building over time, the teaching supports the doing of science. The scientific and engineering practices are used with core ideas and CCC so students can explain phenomena or design solutions to problems.</p>	<p><b>Level 2</b>                  The teaching involves a focus on the three dimensions, and they are each stated as goals, but they do not build together toward understanding. The scientific and engineering practices are used with core ideas and CCC in a superficial manner and lack focus on explaining phenomena or solving problems.</p>	<p><b>Level 3</b>                  There is potential for the teaching to involve the three dimensions, but they do not build over time, and/or the blending of the dimensions is not observed. The teaching does not support students in doing science and using the three dimensions in an authentic way.</p>	<p><b>Level 4</b>                  The teaching emphasizes only one or two of the three dimensions in lesson goals. The dimensions included in the lesson are only partially used for building toward understanding.                  The teaching does not support students in doing science.</p>
<p><b><u>Ratings:</u></b></p> <p><b><u>Strengths:</u></b></p> <p><b><u>Suggestions for improvement:</u></b></p>			

(continued)

From: Miller, E. and Krajcik, J.- Reflecting on Instruction to Promote Alignment to the NGSS and Equity  
 Editors: Lee, O., Miller, E. and Januszyk, R.

## CHAPTER 14

<b>Criterion 2: Attention to Context</b> <b>Does the teaching situate science learning in a relevant, authentic, and meaningful context that builds on home, community, and cultural resources, and engage students to experience phenomena?</b> <i>Indicators: Teaching purposefully (1) makes explicit connections to student lives and/or language and culture, involving students' neighborhood and community, (2) engages students in phenomena driven by student-centered questions or problems, (3) uses contexts that students find meaningful to explore, (4) connects science and engineering problems to real-world sociopolitical contexts, (5) uses diverse role models of scientists and engineers, and (6) links science to careers.</i>			
Level 1	Level 2	Level 3	Level 4
<p>The teaching offers a strong connection to students' lives and builds on current contexts. The learning hinges on students' experiencing a variety of phenomena and contexts that students find meaningful. Connections are drawn for students of science and engineering in careers.</p>	<p>The teaching makes some connections to students' lives, and/or limits or interferes with learning focused on the experiencing of phenomena. Students know the context but don't find it meaningful. The teaching makes occasional reference to science and engineering in careers.</p>	<p>The teaching superficially builds on students' lives and experiences, and/or connects learning to the phenomenon only indirectly. Students do not find the context meaningful. The teaching may make some reference to science and engineering in careers.</p>	<p>The teaching does not connect students' lives to science, and/or does not include learning based on experiencing of phenomena. Students do not find the context meaningful. There is little or no reference to science and engineering as it is carried out in careers.</p>
<p><b>Ratings:</b></p> <p><b>Strengths:</b></p> <p><b>Suggestions for improvement:</b></p>			

(continued)

From: Miller, E. and Krajcik, J. Reflecting on Instruction to Promote Alignment to the NGSS and Equity  
 Editors: Lee, O., Miller, E. and Januszyk, R.

## Reflecting on Instruction to Promote Alignment to the NGSS and Equity

<b>Criterion 3: Opportunity for Discourse</b> <b>To what extent does the teaching promote meaningful discourse around sense making and problem solving, and support all students including English language learners, students with difficulties processing language, and nonstandard English speakers in acquiring the language of science? How are speaking, listening, reading and writing integrated to enhance discourse?</b>			
<i>Indicators: Teaching includes (1) meaningful and guided support for language development, (2) support for and expectation of student discourse, (3) explicit models and embedded opportunities to practice the language of science with links to students' home language, (4) clear reliance on overarching ideas, (5) expectation for students to use evidence to support their positions, and (6) scientific and technical vocabulary anchored in phenomena and experiences.</i>			
<b>Level 1</b> The discourse and literacy opportunities are supported and clearly defined, varied, and conceptualized based on making sense of relevant experiences in the classroom and/or solving problems. Students use evidence to support their claims.	<b>Level 2</b> The discourse and literacy opportunities are supported and clearly defined and the purpose of the discourse is present, but authenticity is needed to demonstrate its relevance and importance in the sense making of phenomena. Students only infrequently use evidence to support their claims.	<b>Level 3</b> The literacy and discourse opportunities need to be better supported and conceptualized, and has contrived purpose around sense making and/or problem solving is needed. Students are not required to use evidence to support their claims.	<b>Level 4</b> The discourse and literacy opportunities in the lesson are not supported or clearly defined or missing entirely. Students are not required to use evidence to support their claims.
<b>Ratings:</b>  <b>Strengths:</b>  <b>Suggestions for improvement:</b>			

*(continued)*

**From: Miller, E. and Krajcik, J. Reflecting on Instruction to Promote Alignment to the NGSS and Equity**  
**Editors: Lee, O., Miller, E. and Januszzyk, R.**

## CHAPTER 14

<b>Criterion 4: Emphasis on Student Thinking and Reflection</b> <b>Does the teaching pay attention to students' current understanding and ideas, use a variety of formative assessment to support student learning, deliver opportunities for differentiation and co-construction of learning, provide scaffolding of challenging tasks and/or extend learning when appropriate?</b>			
<i>Indicators: Teaching purposely (1) solicits and builds on current and prior science ideas from the class, (2) utilizes technology in a meaningful way in authentic contexts, (3) includes time for student metacognitive reflection, (4) engages students in multimodal experiences, (5) offers collaborative groups to participate in tasks or solve problems, and (6) builds on students' worldviews and epistemologies.</i>			
<b>Level 1</b> The teaching is student centered, well-reasoned and accesses and builds on ideas. Teachers and students co-construct understanding. Evidence of building on varied methods of assessment is present. Links to students' prior ideas are made.	<b>Level 2</b> Most of the teaching accesses and builds on student strengths and ideas. However, there are aspects of differentiation, social construction of learning, and student-centered instruction that are missing. Some links to prior knowledge are made. Building on assessment data is present, but vague or unvaried.	<b>Level 3</b> The teaching attempts to be focused on student ideas and strengths. It is not always clear if the differentiation is based on rationale in terms of student current understanding and student learning outcomes. Assessment does not inform teaching moves. Few links to prior knowledge are made.	<b>Level 4</b> The teaching is not organized around student ideas or strength. There is no clear and sound rationale present for the teaching decisions or differentiation. No assessment is included or only a summative assessment is issued. No links to prior knowledge are made.
<b>Ratings:</b>			
<b>Strengths:</b>			
<b>Suggestions for improvement:</b>			

From: Miller, E. and Krajcik, J. Reflecting on Instruction to Promote Alignment to the NGSS and Equity  
 Editors: Lee, O., Miller, E. and Januszyk, R.