

SCIENCE RUBRICS

2016-2017

PLANNING		ESTABLISHING A BALANCED INSTRUCTIONAL FOCUS	
S1: How do the plans support student learning of scientific concepts and inquiry skills? (TPEs 1,4,9)			
Level 1	Level 2	Level 3	Level 4
<ul style="list-style-type: none"> The standards, learning objectives, learning tasks, and assessments either have no central focus or a one-dimensional focus (e.g., solely on a scientific phenomenon, science concept, or investigation/experimentation skills). 	<ul style="list-style-type: none"> The standards, learning objectives, learning tasks, and assessments have an overall focus that is primarily one-dimensional (e.g., a scientific phenomenon, science concept, or investigation/experimentation skills). The focus includes vague connections among science concepts, real world phenomena, and investigation/experimentation skills. 	<ul style="list-style-type: none"> Learning tasks <i>or</i> the set of assessment tasks focus on multiple dimensions of science learning through clear connections among science concepts, real world phenomena, and investigation/experimentation skills. A progression of learning tasks and assessments is planned to build understanding of the central focus of the learning segment. 	<ul style="list-style-type: none"> Both learning tasks <i>and</i> the set of assessment tasks focus on multiple dimensions of science learning through clear connections among science concepts, real world phenomena, and investigation/experimentation skills. A progression of learning tasks and assessments guides students to build deep understandings of the central focus of the learning segment.

PLANNING		MAKING CONTENT ACCESSIBLE	
S2: How do the plans make the curriculum accessible to the students in the class? (TPEs 1,4,5,6,7,8,9)			
Level 1	Level 2	Level 3	Level 4
<ul style="list-style-type: none"> Plans refer to students' experiential backgrounds¹, interests, or prior learning² that have little or no relationship to the learning segment's standards/objectives. <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> There are significant content inaccuracies in plans that will lead to student misunderstandings. 	<ul style="list-style-type: none"> Plans draw on students' experiential backgrounds, interests, or prior learning to help students reach the learning segment's standards/objectives. Plans for the implementation of learning tasks include support³ to help students who often struggle with the content. 	<ul style="list-style-type: none"> Plans draw on students' prior learning as well as experiential backgrounds or interests to help students reach the learning segment's standards/objectives. Plans for learning tasks include scaffolding or other structured forms of support⁴ to provide access to grade-level standards/objectives. 	<p>All components of Level 3 plus:</p> <ul style="list-style-type: none"> Plans include well-integrated instructional strategies that are tailored to address a variety of specific student learning needs.

¹ Cultural, linguistic, social, economic

² In or out of school

³ Such as strategic groupings of students; circulating to monitor student understanding during independent or group work; checking on particular students.

⁴ Such as multiple ways of representing content; concrete models; modeling strategies of scientific inquiry; providing graphic organizers, rubrics, or sample work.

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PLANNING		DESIGNING ASSESSMENTS	
S3: What opportunities do students have to demonstrate their understanding of the standards and learning objectives? (TPEs 2,3)			
Level 1	Level 2	Level 3	Level 4
<ul style="list-style-type: none"> • There are limited opportunities provided for students to learn what is measured by assessments. OR • There is a significant mismatch between one or more assessment instruments or methods and the standards/objectives being assessed. 	<ul style="list-style-type: none"> • Opportunities are provided for students to learn what is assessed. • It is not clear that the assessment of one or more standards/objectives go beyond surface-level understandings. 	<ul style="list-style-type: none"> • Opportunities are provided for students to learn what is assessed. • The assessments allow students to show some depth of understanding or skill with respect to the standards/objectives. • The assessments access both productive (speaking/writing) and receptive (listening/reading) modalities to monitor student understanding. 	<p>All components of Level 3 plus:</p> <ul style="list-style-type: none"> • Assessments are modified, adapted, and/or designed to allow students with special needs opportunities to demonstrate understandings and skills relative to the standards/objectives.

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INSTRUCTION		ENGAGING STUDENTS IN LEARNING	
S4: How does the candidate actively engage students in their own understanding of collecting, analyzing, and interpreting scientific data? (TPEs 1,5,11)			
Level 1	Level 2	Level 3	Level 4
<ul style="list-style-type: none"> • Students have limited opportunities in the clips to engage with content in ways likely to improve their abilities to collect, analyze, and interpret scientific data. OR • The clips do not focus on collecting and analyzing scientific data. OR • Classroom management is problematic and student behavior interferes with learning or there are safety violations visible on the videotape posing an immediate danger to students. 	<ul style="list-style-type: none"> • Strategies for intellectual engagement seen in the clips offer opportunities for students to collect, analyze, and interpret scientific data. • If needed for the activity, safety measures are taken. 	<ul style="list-style-type: none"> • Strategies for intellectual engagement seen in the clips offer structured opportunities for students to actively collect, analyze, and interpret scientific data. • These strategies reflect attention to student characteristics, learning needs, and/or language needs. • No potential safety problems are visible in the videotapes. 	<ul style="list-style-type: none"> • Strategies for intellectual engagement seen in the clips offer structured opportunities for students to actively collect, analyze, and interpret scientific data. • These strategies are explicit, and clearly reflect attention to students with diverse characteristics, learning needs, and/or language needs. • No potential safety problems are visible in the videotapes.

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INSTRUCTION		MONITORING STUDENT LEARNING DURING INSTRUCTION	
S5: How does the candidate monitor student learning during instruction and respond to student questions, comments, and needs? (TPEs 2,5)			
Level 1	Level 2	Level 3	Level 4
<ul style="list-style-type: none"> • The candidate primarily monitors student understanding by asking surface-level questions and evaluating student responses as correct or incorrect. • Candidate responses are not likely to promote student thinking. OR • Materials or candidate responses include significant content inaccuracies that will lead to student misunderstandings or misconceptions. 	<ul style="list-style-type: none"> • The candidate monitors student understanding by eliciting student responses that require thinking about science concepts and the quality of data. • Candidate responses represent reasonable attempts to improve student abilities to collect, analyze, and interpret scientific data. 	<ul style="list-style-type: none"> • The candidate monitors student understanding by eliciting student responses that require thinking about science concepts and the quality of data. • Candidate responses build on student input to guide improvement of students' abilities to collect, analyze, and interpret scientific data. 	<p>All components of Level 3 plus:</p> <ul style="list-style-type: none"> • The candidate elicits explanations of student thinking about science concepts and the quality of data, and uses these explanations to further the understanding of all students.

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ASSESSMENT		ANALYZING STUDENT WORK FROM AN ASSESSMENT	
S6: How does the candidate demonstrate an understanding of student performance with respect to standards/objectives? (TPEs 1,3)			
Level 1	Level 2	Level 3	Level 4
<ul style="list-style-type: none"> • The criteria/rubric and analysis have little connection with the identified standards/objectives. OR • Student work samples do not support the conclusions in the analysis. 	<ul style="list-style-type: none"> • The criteria/rubric and analysis focus on what students did right or wrong in relationship to identified standards/objectives. • The analysis of whole class performance describes some differences in levels of student learning for the content assessed. 	<ul style="list-style-type: none"> • The criteria/rubric and analysis focus on patterns of student errors, misconceptions, skills, and understanding to analyze student learning in relation to standards/objectives. • Specific patterns are identified for individuals or subgroup(s) in addition to the whole class. 	<p>All components of Level 3 plus:</p> <ul style="list-style-type: none"> • The criteria/rubric and analysis focus on partial understandings as well. • The analysis is clear and detailed.

ASSESSMENT		USING ASSESSMENT TO INFORM TEACHING	
S7: How does the candidate use the analysis of student learning to propose next steps in instruction? (TPEs 3,4)			
Level 1	Level 2	Level 3	Level 4
<ul style="list-style-type: none"> • Next steps are vaguely related to or not aligned with the identified student needs. OR • Next steps are not described in sufficient detail to understand them. OR • Next steps are based on inaccurate conclusions about student learning from the assessment analysis. 	<ul style="list-style-type: none"> • Next steps focus on improving student performance through general support that addresses some identified student needs. • Next steps are based on accurate conclusions about student performance on the assessment and are described in sufficient detail to understand them. 	<ul style="list-style-type: none"> • Next steps focus on improving student performance through targeted support to individuals and groups to address specific identified needs. • Next steps are based on whole class patterns of performance and some patterns for individuals and/or subgroups and are described in sufficient detail to understand them. 	<p>All components of Level 3 plus:</p> <ul style="list-style-type: none"> • Next steps demonstrate a strong understanding of both the identified content and language standards/objectives and of individual students and/or subgroups.

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ASSESSMENT		USING FEEDBACK TO PROMOTE STUDENT LEARNING	
S8: What is the quality of feedback to students? (TPEs 3,4)			
Level 1	Level 2	Level 3	Level 4
<ul style="list-style-type: none"> • Feedback is general and provides little guidance for improvement related to learning objectives. OR • The feedback contains significant inaccuracies. 	<ul style="list-style-type: none"> • Timely feedback identifies what was done well and areas for improvement related to specific learning objectives. 	<ul style="list-style-type: none"> • Specific and timely feedback helps the student understand what s/he has done well, and provides guidance for improvement. 	<ul style="list-style-type: none"> • Specific and timely comments are supportive and prompt analysis by the student of his/her own performance. • The feedback shows strong understanding of students as individuals in reference to the content and language objectives they are trying to meet.

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REFLECTION		MONITORING STUDENT PROGRESS	
S9: How does the candidate monitor student learning and make appropriate adjustments in instruction during the learning segment? (TPEs 2,10,12,13)			
Level 1	Level 2	Level 3	Level 4
<ul style="list-style-type: none"> • Daily reflections indicate inconsistent monitoring of student performance. • There is limited evidence of adjusting instruction in response to observed problems, e.g., student confusion, a lack of challenge, time management. 	<ul style="list-style-type: none"> • Daily reflections identify what students could or could not do within each lesson. • Adjustments to instruction are focused on improving directions for learning tasks, time management, or reteaching. 	<ul style="list-style-type: none"> • Daily reflections indicate monitoring of student progress toward meeting the standards/objectives for the learning segment. • Adjustments to instruction are focused on addressing some individual and collective learning needs. 	<p>All components of Level 3 plus:</p> <ul style="list-style-type: none"> • Adjustments to instruction are focused on deepening key skills and understandings related to using science concepts and inquiry skills to explain a scientific phenomenon.

REFLECTION		REFLECTING ON LEARNING	
S10: How does the candidate use research, theory, and reflections on teaching and learning to guide practice? (TPEs 10,11,12,13)			
Level 1	Level 2	Level 3	Level 4
<ul style="list-style-type: none"> • Reflections on teaching practice are erroneously supported through a significant misapplication of theory or research principles. <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • Changes in teaching practice are not based on reasonable assumptions about how student learning was affected by planning, instruction, or assessment decisions. 	<ul style="list-style-type: none"> • Reflections on teaching practice are consistent with principles from theory and research. • Changes in teaching practice are based on reasonable assumptions about how student learning was affected by planning, instruction, or assessment decisions. 	<ul style="list-style-type: none"> • Reflections on teaching practice are based on sound knowledge of research and theory linked to knowledge of students in the class. • Changes in teaching practice are based on reasonable assumptions about how student learning was affected by planning, instruction, or assessment decisions. 	<ul style="list-style-type: none"> • Reflections on teaching practice integrate sound knowledge of research and theory about effective teaching practice, knowledge of students in the class, and knowledge of content. • Changes in teaching practice are specific and strategic to improve individual and collective student understanding of standards/objectives.

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ACADEMIC LANGUAGE UNDERSTANDING LANGUAGE DEMANDS⁵ AND RESOURCES			
S11: How does the candidate identify the language demands of learning tasks and assessments relative to the students' current levels of academic language proficiency?			
Level 1	Level 2	Level 3	Level 4
<ul style="list-style-type: none"> • Candidate's description of students' academic language proficiency at lower levels is limited to what they CANNOT do. • Language genre (s)⁶ discussed is only tangentially related to the academic purposes of the learning segment. • Candidate identifies unfamiliar vocabulary without considering other linguistic features. <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • Candidate did not identify any language demands within the learning and assessment tasks. 	<ul style="list-style-type: none"> • Candidate describes academic language strengths and needs of students at different levels of academic language proficiency. • The language genre(s) discussed are clearly related to the academic purposes of the learning segment and language demands are identified. • Candidate identifies vocabulary that may be problematic for students. 	<ul style="list-style-type: none"> • Candidate describes academic language strengths and needs of students at different levels of academic language proficiency. • The language genre(s) discussed are clearly related to the academic purpose of the learning segment and language demands are identified. One or more linguistic features and/or textual resources of the genre are explicitly identified. • Candidate identifies essential vocabulary for students to actively engage in specific language tasks. 	<ul style="list-style-type: none"> • Candidate describes academic language strengths and needs of students at the full range of academic language proficiency. • The language genre discussed is clearly related to the academic purpose of the learning segment and language demands are identified. One or more genre-related linguistic features or textual resources of the specific tasks/materials are explicitly identified and related to students' varied levels of academic language proficiency. • Candidate identifies for instruction related clusters of vocabulary.

⁵ Language demands might include: translating words or sentences into symbolic formulas or formulas in to words and sentences; quickly decoding symbols into their abstract meanings; distinguishing scientific uses of words used in everyday language (e.g., balance, base; function); using technical language to explain intuitive understandings; using complex sentences to express hypotheses; using precise language to explain science concepts or reasoning; combining language and numbers to persuade an audience to accept an hypothesis.

⁶ Key genres in science might include: *interpreting* or *representing* mathematical meanings represented symbolically, graphically or linguistically; *recounting* procedures for an experiment;; *evaluating* or constructing scientific *arguments*; *explaining* science concepts; *defining* technical terms; engaging in collaborative and oral *scientific inquiry*.

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ACADEMIC LANGUAGE		DEVELOPING STUDENTS' ACADEMIC LANGUAGE REPERTOIRE	
S12: How do the candidate's planning, instruction, and assessment support academic language development? (TPEs 1,4,7,8)			
Level 1	Level 2	Level 3	Level 4
<ul style="list-style-type: none"> • The candidate gives little or sporadic support to students to meet the language demands of the learning tasks. <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • Language and/or content is oversimplified to the point of limiting student access to the core content⁷ of the curriculum. 	<ul style="list-style-type: none"> • The candidate uses scaffolding or other support⁸ to address identified gaps between students' current language abilities and the language demands of the learning tasks and assessments, including selected genres and key linguistic features. • Candidate articulates why instructional strategies chosen are likely to support aspects of students' language development. 	<ul style="list-style-type: none"> • The candidate's use of scaffolding or other support provides access to core content while also providing explicit models, opportunities for practice, and feedback for students to develop further language proficiency for selected genres and key linguistic features. • Candidate articulates why the instructional strategies chosen are likely to support specific aspects of students' language development for different levels of language proficiency. 	<ul style="list-style-type: none"> • The candidate's use of scaffolding or other support provides access to core content while also providing explicit models, opportunities for practice, and feedback for students to develop further language proficiency for selected genres and key linguistic features. • Candidate articulates why the instructional strategies chosen are likely to support specific aspects of students' language development for the full range of language proficiency and projects ways in which the scaffolds can be removed as proficiency increases.

⁷ Core content is the set of facts, concepts, skills, and abilities that are absolutely necessary to participate at least minimally in the learning/assessment tasks in the learning segment.

⁸ Such support might include one or more of the following: modeling strategies for comprehending or constructing texts such as lab reports; explicit communication of the expected features of oral or written texts (e.g., using rubrics, models, and frames); use of strategies that provide visual representations of content while promoting literacy development (e.g., graphic organizers); vocabulary development techniques (context cues, categorization, analysis of word parts, etc.); opportunities to work together with students with different language and literacy skills.