The Teacher Performance Assessment stems from a 25-year history of development in performance-based assessments of teaching quality. The Teacher Performance Assessment Consortium (Stanford and AACTE) acknowledges the National Board for Professional Teaching Standards, the Interstate Teacher Assessment and Support Consortium, and the Performance Assessment for California Teachers (PACT) for their pioneering work using discipline-specific portfolio assessments to evaluate teaching quality. The 2011-12 field test version of this handbook has been developed with thoughtful input from teachers and teacher educators representing various national design teams, national subject matter organizations (ACEI, IRA, NASPE, NCSS, NCTE, NCTM, NSTA, etc.), and content validation review teams. All contributions are recognized and appreciated.
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Overview of the Teaching Performance Assessment in Secondary Science

Purpose

The Teaching Performance Assessment (TPA) is being developed as a nationally available assessment of readiness to teach for novices. The assessment is focused on student learning and is designed around the principles that successful teachers apply knowledge of subject matter and subject-specific pedagogy, develop and apply knowledge of their students’ varied needs, consider research/theory about how students learn, and reflect and act on evidence of the effects of their instruction on student learning.

As a performance-based assessment, the TPA is designed to engage candidates in demonstrating their understanding of teaching and student learning in authentic, experiential ways. As a participant in this assessment, you will have an opportunity to develop a collection of materials that represents the ways in which you teach students in your “student teaching” classroom or other instructional settings. When developing your materials, you will be prompted to synthesize what you have learned throughout your preparation program and apply it with the students you currently teach. Your TPA evidence will demonstrate your current abilities, knowledge and skills as a beginning teacher on your way to becoming a highly accomplished teacher.

Summary of Tasks

In this assessment, you will describe, analyze, and evaluate the teaching of a series of 3–5 science lessons (or, if teaching science within a large time block, about 3 to 5 hours of connected instruction) referred to as a learning segment. The learning segment should provide opportunities for students to develop their abilities to use science concepts and scientific inquiry skills to explain a real world phenomenon.

You will complete four tasks for the TPAC assessment:

1. Planning, Instruction and Assessment
2. Instructing and Engaging Students in Learning
3. Assessing Student Learning
4. Analyzing Teaching

Evidence of Teaching Practice: Artifacts and Commentaries

To complete the assessment, you will submit artifacts and commentaries as evidence of how you planned and implemented instruction to deepen student learning in science. Artifacts represent the authentic work of you and your students. These include lesson plans, copies of instructional and assessment materials, one or two video clips of your teaching, and student work samples.

The commentaries are your opportunity to describe your artifacts, explain the rationale behind their use, and analyze and reflect on what you learned about your teaching practice and your students’ learning. In each commentary, you will respond to prompts to provide evidence of what you know and understand about your students and their learning. Note that although your writing ability will not be scored directly, commentaries must be clearly written and well focused.
Evaluation and Scoring Criteria

The evidence you submit will be judged on five dimensions of teaching: Planning, Instruction, Assessment, Analyzing Teaching and Academic Language. Evidence for the planning, instruction, assessment, and analyzing teaching dimensions will come from the corresponding tasks. Evidence for the academic language dimension will come from the planning and either the instruction or assessment tasks.

The rubrics used to score your performance on the TPA are included in the handbook and are linked electronically to each task. The descriptors in the five level rubrics address a wide range of performance representing the knowledge and skills of a novice not ready to teach (Level 1) to advanced practices of a highly accomplished beginner (Level 5). When preparing your artifacts and commentaries, refer to the rubrics frequently to guide your thinking, planning and writing.

Structure of the Handbook

The instructions in the following pages will guide you in putting together the artifacts and commentaries required within the four tasks of the TPA. Instructions for each task are organized in three sections: 1) What to Think About, 2) What Do I Need to Do? and 3) What Do I Need to Write? Review all instructions carefully before beginning to teach the learning segment to ensure that you are well prepared for all tasks.

For this Field Test Pre-Release Handbook sample guidelines for document formatting and submission are found in the ‘Sample Evidence Chart’.

The remainder of this introduction provides an overview of the assessment components and your professional responsibilities in preparing your materials.
Assessment Components at a Glance

<table>
<thead>
<tr>
<th>What to Do</th>
<th>What to Submit</th>
<th>Scoring Rubrics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TPAC Task 1: Planning Instruction and Assessment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Provide relevant information about your instructional context.</td>
<td>- Part A: Context for Learning Information</td>
<td>- Planning Rubrics (S1, 2, and 3)</td>
</tr>
<tr>
<td>- Select a learning segment of 3-5 lessons (or, if teaching science within a large time block, about 3-5 hours of connected instruction). It should develop students’ abilities to use scientific concepts and scientific inquiry to explain a real world phenomenon.</td>
<td>- Part B: Lesson Plans for Learning Segment</td>
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<tr>
<td>- Consider your students’ strengths and needs and select a central science focus and a key language demand for the learning segment.</td>
<td>- Lesson plans</td>
<td></td>
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<tr>
<td>- Create an instruction and assessment plan for the learning segment, and write lesson plans.</td>
<td>- Instructional Materials</td>
<td></td>
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<tr>
<td>- Respond to commentary prompts to explain what you know about your students and the thinking behind your plans.</td>
<td>- Assessment Tools/Procedures and Criteria</td>
<td></td>
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<tr>
<td>- Make daily notes about the effectiveness of your teaching for your students’ learning (will be used in writing the Analyzing Teaching commentary in Task 4).</td>
<td>- Part C: Planning Commentary</td>
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</tbody>
</table>

**TPAC Task 2: Instructing and Engaging Students in Learning**

<table>
<thead>
<tr>
<th>What to Do</th>
<th>What to Submit</th>
<th>Scoring Rubrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Collect permission forms from parents/guardians and prepare for video-recording.</td>
<td>- Part A: Video Clips</td>
<td>- Instruction Rubrics (S4 and 5)</td>
</tr>
<tr>
<td>- Review and identify lessons where you are engaging your students in a scientific inquiry where they are collecting scientific data and sharing interpretations to explain a phenomenon.</td>
<td>- Part B: Instruction Commentary</td>
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<tr>
<td>- Submit two video clips. The total running time of each should not exceed 10 minutes.</td>
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<tr>
<td>- Respond to commentary prompts to analyze your teaching and your students’ learning in the video clips.</td>
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</table>
**What to Do**

**TPAC Task 3: Assessing Student Learning**

- Analyze class performance from one assessment completed during the learning segment.
- Identify three student work samples that illustrate patterns of student understanding within the class.
- Select and analyze the learning of two focus students in more depth, and document your feedback on their work.
- Respond to commentary prompts to report conclusions from your analysis and describe feedback given to the two focus students.
- Identify next steps in instruction based on your analysis.
- Provide the assessment task and evaluation criteria.

**TPAC Task 4: Analyzing Teaching**

- Using notes you have recorded throughout the learning segment, respond to commentary prompts to explain what you have learned about your teaching practice and two or three things you would do differently if you could teach the learning segment over. Explain why the changes would improve your students’ learning.

**TPAC Academic Language in Science (evidence is gathered across tasks as noted)**

- Select one key language demand related to the central focus. Explain how you will support students with varied language needs.
- Cite evidence of opportunities for students to understand and use the targeted academic language: 1) the video clips from the Instruction task; OR 2) the student work samples from the Assessment task.
- Analyze the effectiveness of your language supports.

**What to Submit**

- Part A: Student Work Samples
- Part B: Evidence of Feedback
- Part C: Assessment Commentary

**Scoring Rubrics**

- Assessment Rubrics (S6, 7, and 8)
- Analyzing Teaching Commentary
- Analyzing Teaching Rubric (S9)
- Planning Commentary (Prompt 4)
- Academic Language Rubrics (S10, 11, 12)
- Instruction Commentary (Prompt 4)
- OR
- Assessment Commentary (Prompt 4)
Professional Responsibilities

Refer to the following table for an overview of professional responsibilities inherent in the development of your TPA evidence.

<table>
<thead>
<tr>
<th>Responsibility</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Protect confidentiality</td>
<td>• To protect confidentiality, please remove your name and use pseudonyms or general references (e.g., &quot;the district&quot;) for your school, district, or cooperating teacher. You may use either pseudonyms or first names only for students. Do this in all commentaries, and mask or remove names that could identify people or institutions from all materials submitted, including lesson plans.</td>
</tr>
</tbody>
</table>
| Acquiring Permissions                       | • Before you record your classroom instruction, ensure that you have the appropriate permission from the parents/guardians of your students and from adults who appear in the video-recording.  
  • Your program will provide you with procedures and necessary forms to obtain these permissions, according to agreements with the school or district in which you are student teaching or completing your internship.  
  • The release forms are not to be submitted with your materials, but you should follow your campus policy for retaining them. |
| Citing Sources                              | • Provide source citations for all materials that you did not create (e.g., published texts, websites, material from other educators). List all citations by lesson number at the end of the planning commentary. |
| Aligning Instruction with State Standards   | • As part of the assessment, you will document the alignment of your lesson plans with state-adopted academic content standards that are the target of student learning. Refer to the Department of Education Web site for your state to obtain copies of relevant standards for this assessment. |
| Collaborate with others while developing your own teaching practice | As a credential candidate, you are encouraged to seek assistance, input and feedback from your university supervisors, cooperating/master teachers, university instructors, or peers during the completion of this assessment. However, the ultimate responsibility for compiling the documentation lies with you. Therefore, when you submit your completed assessment for scoring, you will be asked to attest to the following statements:  
  • I have primary responsibility for teaching the students/class during the learning segment profiled in this assessment;  
  • The video clip(s) submitted show me teaching the students/class profiled in the evidence submitted;  
  • The student work included in the documentation is that of my students, completed during the learning segment documented in this assessment;  
  • I am sole author of the commentaries and other written responses to prompts and other requests for information in this assessment;  
  • Appropriate citations have been made for all materials in the assessment whose sources are from published text, the Internet, or other educators. |
Task 1: Planning Instruction and Assessment

What to Think About

In Task 1: Planning Instruction and Assessment, you will describe your plans for the learning segment and explain how they are appropriate for the students and the content you are teaching. Think about what you know about your students as learners and provide information about what they know and can do related to the content you will teach. Consider your students’ prior learning and experiences including their academic content knowledge, language development, social/emotional development, family/cultural assets, interests and lived experiences; as well as any identified learning needs.

In this task, you will demonstrate your ability to organize curriculum, instruction, and assessment to help diverse students meet content standards and develop related academic language. You will provide evidence of your ability to select, adapt, or design learning tasks and materials that offer your students equitable access to science curriculum content and associated academic language.

Task 1 sets the stage for you to demonstrate and analyze the effectiveness of your teaching of the planned learning segment. Be explicit about how what you know about your students informs the teaching you propose.

What Do I Need to Do?

☐ If you teach more than one class, select one focus class for this assessment.
☐ Provide information about your teaching context by downloading and completing the Context for Learning Information template.
☐ Review the curriculum with your cooperating teacher and select a learning segment of 3 to 5 lessons (or, if teaching science within a large time block, about 3 to 5 hours of connected instruction) to describe, analyze, and reflect upon. The learning segment should provide opportunities for students to develop their abilities to use scientific concepts and scientific inquiry to explain a real world phenomenon.
☐ Identify the central focus along with the content standards and objectives you will address in the learning segment.
☐ Consider language demands associated with content understandings in the learning segment. These include the oral and written academic language that students will need to understand or produce in your learning segment. Select a language demand in the learning segment that is critical to understanding instruction or materials and/or demonstrating learning, and in which your students would benefit from more instruction and/or practice.

(In Tasks 2 and 3, you will have opportunities to provide evidence of students’ understanding and use of the targeted academic language. You may choose to cite this evidence in: 1) the Instruction task (video clips) OR 2) the Assessment task (student work samples).
Write a lesson plan for each lesson in the learning segment. Your credential program may require you to use a specific lesson plan format for this assessment. Regardless, lesson plans should minimally include the following information:

- State-adopted student academic content standards that are the target of student learning. Please list the number and text of the standard. If only a portion of a standard is being addressed, then only list the relevant part(s).
- Learning objectives associated with the content standards
- Informal and formal assessment tools and/or procedures used to monitor student learning, including type(s) of assessment and what is assessed
- Instructional strategies and learning tasks used to support student learning, including what you and the students will be doing
- Resources and materials

If you make significant changes to your lesson plans when teaching the learning segment, only submit the revised lesson plans instead of the original to reflect the adaptations that guided your teaching.

Submit selected instructional materials and all assessment tools and/or procedures used during the learning segment (up to 5 artifact pages per lesson). The instructional materials might include class handouts, overhead transparencies, PowerPoint or SmartBoard slides. See the Lesson Plan template for directions for how to submit the instructional materials and assessments.

In preparation for writing the Analyzing Teaching commentary (Task 4), record notes on the effectiveness of your instruction for various students after teaching each lesson. You will NOT submit these, so they can be in any form that is useful to you, e.g., annotated lesson plans, bulleted notes, etc. Consider evidence of your students’ knowledge and conceptual understanding of the science concepts, the phenomenon, the nature of science; and scientific inquiry. Your notes should address your reflections on the following: What's working? What's not? For whom? And why? (as well as citing events and other evidence that led to these conclusions).

**What Do I Need to Write?**

In Task 1: Planning, you will write lesson plans, a description of your Context for Learning, and a Planning Commentary explaining your plans.

The Context for Learning Information and Lesson Plan templates is provided at the end of this Pre-Release Handbook and the prompts for the Planning commentary and template link are below.
Planning Commentary

Complete the Planning Commentary template and provide your responses to each of the prompts below in no more than 9 total single spaced pages (including prompts). If you are prompted to provide any explanations that can be found in your lesson plans, refer to the appropriate page(s) of those plans.

1. **Content Focus**
   - Summarize the central focus for the content you will teach in this learning segment.

2. **Knowledge of Students to Inform Teaching**
   - For each of the categories listed below (a-d), describe what you know about your students’ prior learning and experiences with respect to the central focus of the learning segment.
   - **What do they know, what can they do and what are they learning to do?**
   - Consider the variety of learners in your class who may require different strategies/support:
     a) Academic development (e.g., preconceptions, prerequisite skills, understanding of the nature of science, developmental levels, special educational needs)
     b) **Academic Language** development (e.g., students’ abilities to understand and produce the oral, written, and symbolic language associated with the central focus and standards/objectives within the learning segment)
     c) Family/community/cultural assets (e.g., relevant lived experiences, cultural expectations, and student interests)
     d) **Social and emotional development** (e.g., ability to interact and express themselves in constructive ways, ability to engage in collaborative learning, nature of contributions to a productive learning environment).

3. **Supporting Student Learning in Science**
   - Respond to prompts a-e below to explain how your plans support your students’ learning of scientific concepts and processes related to the central focus of the learning segment. As needed, refer to the instructional materials you have included to support your explanations.
   - Cite research and theory to support your explanations.
     a) Explain how your understanding of your students’ varied preconceptions, prior knowledge, experiences and development guided your choice or adaptation of learning tasks and materials to develop students’ abilities to use science concepts and inquiry skills to explain a real-world phenomenon.
     b) How are the plans for instruction sequenced in the learning segment to build connections between students’ preconceptions (based on prior learning and experience) and new knowledge?
     c) Explain how you will help students use inquiry skills to explore and explain relationships between scientific concepts and phenomena in the learning segment,
     d) Explain how, throughout the learning segment, you will help students understand the relationship of the central focus of the learning segment to crosscutting concepts in science and to better understand the nature of science and the difference between scientific and nonscientific evidence and explanations.
     e) Describe any instructional strategies planned to support students with specific learning needs. This will vary based on what you know about your students, but may include students with IEPs, English learners, or gifted students needing greater support or challenge.
4. **Supporting Student Understanding and Use of Academic Language**

Respond to the prompts below to explain how your plans support your students’ academic language development.

a) Identify the key academic **language demand** and explain why it is integral to the central focus for the segment and appropriate to students’ academic language development. Consider **language functions** and **language forms**, essential vocabulary, symbols, and/or phrases for the concepts and skills being taught, and instructional language necessary for students to understand or produce oral and/or written language within learning tasks and activities.

b) Explain how planned instructional supports will assist students to understand academic language related to the key language demand to express and develop their content learning. Describe how planned supports vary for students at different levels of academic language development.

5. **Monitoring Student Learning**

a) Explain how the informal and formal assessments were selected and/or designed to provide evidence you will use to monitor student progress toward the standards/objectives. Consider how the assessments will provide evidence of student understanding of science concepts, the phenomenon, the nature of science, and scientific inquiry.

b) Describe any modifications or accommodations to the planned assessment tools or procedures that allow students with specific needs to demonstrate their learning.

The Planning Rubrics (S1) are at the end of this Pre-Release Handbook.

The Academic Language rubrics (S10 and 11) are at the end of this Pre-Release Handbook.
Task 2: Instructing and Engaging Students in Learning

What to Think About

The Instructing and Engaging Students in Learning task asks you to demonstrate how you work with students to develop their scientific inquiry skills to collect and record scientific evidence, using the evidence, along with science concepts, to explain a phenomenon. You will provide evidence of your ability to intellectually engage students in meaningful science tasks, monitor their understanding, and use your responses to students to guide their learning.

Think about how your choices of instructional strategies engage students in collecting valid scientific data, analyzing and interpreting that data, and constructing and communicating an explanation of a phenomenon. While teaching, how do you prompt students to make connections between their prior learning and experiences and the science content and processes to be learned? Consider which lessons in the learning segment require meaningful student engagement in scientific inquiry around concepts and phenomena. and plan to video record on those days in particular. Be strategic in selecting video clips that reveal the ways in which students interact with you and with each other as well as engage with the science concepts, and how you are eliciting and monitoring their understandings of science. Consider how you support students in thinking about relevant science concepts, the quality of the data they collect, and connections between the data and science concepts to construct and evaluate scientific explanations of phenomena.

What Do I Need to Do?

☐ Examine your plans for the learning segment and identify learning tasks in which students are actively engaged in 1) collecting and recording scientific data and/or 2) interpreting data to explain a scientific phenomenon. The clips will not include the entire inquiry process, but should provide a sample of how you interact with students to support their learning to collect and use data to construct an explanation using science concepts.

☐ Video-record your classroom teaching. View the video(s) to check the video and sound quality, analyze your teaching, and select the most appropriate video clips to submit.

☐ Provide two video clips of no more than ten minutes each in length. The first clip should illustrate how you facilitated your students’ attention to science concepts and data quality while they are collecting data or selecting data collected by others’ and recording it during a scientific inquiry. The second clip should illustrate how you actively engaged students in developing an understanding of how to use scientific data and concepts to construct and evaluate explanations of a phenomenon.

☐ See Video Guidelines

☐ Provide a copy of any relevant writing on the board, overhead, or walls if it is not clearly visible on the video. Insert this document at the end of the Instruction Commentary.

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1 Data collected by others should come from large data sets from reputable sources where students have an opportunity to select and explore relationships between different variables. Many such data sets are available on the Internet.
What Do I Need to Write?

Instruction Commentary

Use the Instruction Commentary template to write a commentary of no more than 5 single-spaced pages (including prompts) that addresses the following prompts.

1. Identify the number of the lesson or lessons from which the clip(s) were recorded.

2. **Ensuring Safety**
   If relevant, describe what you did to ensure the safe use of any hazardous materials or equipment used during the inquiry seen in the clips.

3. **Engaging Students in Learning**
   a) Explain how the instruction (tasks, activities, discussions, and/or teaching strategies) depicted in the clips motivated and intellectually engaged students in a) attending to science concepts and data quality while they are collecting and recording data; and b) analyzing and interpreting the scientific data collected to construct and evaluate explanations of a phenomenon. Cite specific examples from the clips of what students said/did to support your explanation.
   b) Using examples from the clips, describe how your instruction (tasks, activities, discussions, and/or teaching strategies) linked students' preconceptions, prior learning, and experiences with new learning. Prior learning and experience includes students’ academic content knowledge, language development, social/emotional development, family/cultural assets, interests and lived experiences.

4. **Deepening Student Learning During Instruction**
   a) Explain how you elicited student thinking though questions or materials and facilitated responses that supported students in understanding how to collect, analyze, and interpret scientific data.
   b) Cite evidence from the clips of what you and your students said/did to support your explanations.

5. **Evidence of Academic Language** (NOTE: You may provide evidence for academic language with your video clips OR through student work samples in Task 3. If evidence of student understanding and/or use of the key language demand is well represented in the clips, then respond to the prompts below. Otherwise, omit this prompt and respond to prompt 4 in the Assessment task. You must provide this evidence in one of the two available tasks).
   a) Describe evidence in the clips that demonstrates the extent to which students are able to understand and/or use the language associated with the identified language demand (vocabulary, function/form and/or instructional language) in ways that develop understandings of the nature of science and scientific inquiry.
   b) Using this evidence, how well did your language supports or instruction promote academic language development for students with varied language levels?

The Instruction Rubrics (S4) are at the end of this Pre-Release handbook.

The Academic Language Rubrics (S11 and S12) are at the end of this Pre-Release handbook.
Task 3: Assessing Student Learning

What to Think About

The Assessing Student Learning task asks you to assess student learning, analyze student strengths and needs, and use your analysis of student performance to inform instruction. You will provide evidence of your ability to 1) develop evaluation criteria that are aligned with your central focus, standards, and learning objectives; 2) analyze student performance on an assessment in relation to the identified learning objectives; 3) provide feedback to students; and 4) use the analysis of student performance to identify next steps in instruction.

Think about the ways in which you are monitoring, examining, and evaluating evidence of student learning throughout the learning segment. How do you document and make sense of what students have learned? How do you provide feedback? In using assessment evidence to plan next steps for your teaching, consider common learning across most of the class as well as common strengths or needs among several students. Consider both the successes and struggles of your students.

What Do I Need to Do?

☐ Select an assessment from the learning segment that you will use to evaluate your students’ developing knowledge and skills. The assessment should reflect the work of individuals, not groups. The assessment should give both you and the students a sense of how well they are progressing toward learning how to use science concepts and scientific inquiry to explain a real world phenomenon.

☐ Provide a copy of the evaluation criteria (e.g., rubric) and, if these are not obvious from the student work samples, the assessment task/directions/prompt in the Assessment Commentary template.

☐ Collect student work from your entire class and analyze student performance to identify patterns in understanding within the class.

☐ Illustrate the results of your analysis with student work samples.
   a. Select three student work samples. Your choices should represent what students in the class generally understood and what a number of students were still struggling to understand. At least one of the students must have identified learning needs, such as an English language learner or a student with an IEP.
   b. Identify two focus students from the three previously selected student work samples: one student with identified learning needs and one other focus student.

☐ Document and submit evidence of the feedback you provided to the two focus students, either as individuals or as part of a larger group. You may provide a copy of written feedback or video/audio evidence of oral feedback.
   a. If the feedback is written directly on the work sample, be sure that reviewers can distinguish the feedback from the students’ own work. [Link to work sample evidence]
   b. If the feedback occurred in a video/audio clip submitted as part of the Instruction task, identify the timestamp range on the video/audio where the feedback can be found (e.g., Clip 1, 01:35 – 3:05). You may also submit an additional video/audio clip showing oral feedback; label this clip “Feedback clip.” [Link to video feedback evidence]
What Do I Need to Write?

Assessment Commentary

Use the Assessment Commentary template to write a commentary no more than 8 single-spaced pages (including attachments) that addresses the following prompts.

1. Analyzing Student Learning
   a) Identify the specific standards/objectives and central focus from the learning segment measured by the assessment chosen for analysis. Describe any changes from what was planned for this assessment as described in the lesson plans or in the Planning commentary, prompt 5.
   b) Respond to prompts below to create a summary of student learning relative to your evaluation criteria.
      1. Summarize student performance in narrative and/or graphic form (e.g., table or chart).
      2. Discuss what students appear to understand well and where they continue to struggle, including any misunderstandings, errors, confusions, or needs (including a need for greater challenge).
      3. Consider common patterns across the class as well as groups of students with similar strengths or needs. Cite evidence to support your analysis from the three student work samples you selected.
   c) Respond to prompts below by referencing your understanding of the two focus students:
      1. Describe each student’s individual learning strengths and challenges relative to the standards/objectives measured by the chosen assessment. Consider your knowledge of each student (e.g., prior knowledge of the content, language development, academic development, and/or special needs).
      2. After analyzing each student’s work sample, what conclusions did you make regarding their individual learning? Cite specific evidence to support your conclusions.

2. Feedback to Guide Further Learning
   a) In what form did you submit your evidence of feedback (e.g., written directly on work samples, audio files, a time stamp reference for videorecording(s) in the Instruction task)? If submitted via video for Task 2, provide time stamp here.
   b) How did feedback provided to each focus student address individual student needs and learning objectives? Reference specific evidence in the submitted feedback to support your explanation.
   c) What opportunities were/will be provided for students to apply the feedback to improve their work, either within the learning segment or at a later time?

3. Using Assessment to Inform Instruction
   For prompts below, consider what you know about your students and the effectiveness of your instruction when designing next steps. Be sure to connect your next steps to your analysis of the student performances.
   a) Based on your analysis of student performance on this assessment, describe next steps for instruction for the whole class.
   b) Describe any individualized next steps for the two focus students.
   c) Explain how these next steps follow from your analysis of the student performances.
4. **Evidence of Academic Language**: (NOTE: You may provide evidence for academic language with your video clip(s) in Task 2 OR through the student work samples analyzed in this task. If your evidence of the key language demand is well represented in the student work samples, then respond to the prompts below. Otherwise, omit this prompt and respond to prompt 4 in the Instruction task. You must provide this evidence in one of the two available tasks).

   a) Describe evidence from the student work samples that demonstrates the extent to which students are able to understand and/or use the language associated with the identified language demand (vocabulary, function/form and instructional language) in ways that develop content understandings.

   b) Using this evidence, how well did your language supports or scaffolding promote academic language development for students with varied language levels?

The Assessment Rubrics (S6, S7, and S8) are at the end of this Pre-Release handbook.

The Academic Language Rubrics (S11 and S12) are at the end of this Pre-Release handbook.
Task 4: Analyzing Teaching

What to Think About

The Analyzing Teaching task asks you to reflect on your experiences teaching the learning segment and to consider what you have learned about your teaching and the learning of your students. You will provide evidence of your ability to analyze the effectiveness of your teaching and propose changes that would have better supported the learning of your diverse students. Think about what you learned from your experiences teaching each day of the learning segment and the analyses and commentaries you have provided throughout this assessment. What worked? What didn’t? For whom? And why? What is your evidence?

What Do I Need to Do?

- Review your notes and reflections recorded throughout the learning segment and analyze what you have learned about your teaching, your students and their learning.
- Respond to the Analyzing Teaching commentary prompt by explaining what you would do differently, given the opportunity to teach these lessons again to the same group of students.

What Do I Need to Write?

Analyzing Teaching Commentary

Use the Analyzing Teaching Commentary template to write a commentary of no more than two single spaced pages (including prompts) in response to the following prompts.

1. If you could teach these lessons to the same group of students again, what are two or three things you would do differently to improve your students’ understanding of the science concepts, the phenomenon, the nature of science, and science inquiry, based on their varied needs and characteristics? Consider missed opportunities and other aspects of planning, instruction and/or assessment.

2. Citing evidence from your experience teaching this learning segment, explain why you would expect these changes to make a difference in student learning.

The Analyzing Teaching Rubric (S9) is at the end of this Pre-Release handbook
## Planning Rubrics

**PLANNING: PLANNING FOR SCIENTIFIC UNDERSTANDINGS**

**S1: How do the candidate’s plans support the development of students’ abilities to use science concepts and scientific inquiry skills to explain a real world phenomenon?**

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standards, objectives learning tasks and materials are <strong>not aligned with each other</strong>.</td>
<td>Standards, objectives, learning tasks and materials are <strong>loosely or inconsistently aligned with each other</strong>.</td>
<td>Standards, objectives, learning tasks and materials are <strong>consistently aligned with each other and with the central focus for the learning segment</strong>.</td>
<td>Standards, objectives, learning tasks and materials are consistently aligned with the central focus. <strong>Learning objectives clearly define measurable outcomes for student learning.</strong></td>
<td>Standards, objectives, learning tasks and materials are consistently aligned with the central focus. Learning objectives clearly define measurable outcomes for student learning.</td>
</tr>
</tbody>
</table>

Plans for instruction **focus solely on memorization and following prescribed procedures for an “inquiry” with no opportunities for students to collect, analyze, and interpret data to adjust their understandings of the science concepts and the phenomenon.**

OR

There are **significant content inaccuracies** that will lead to student misunderstandings.

Plans for instruction **include opportunities for students to collect, analyze, and interpret data to adjust their understandings of the science concepts and the phenomenon.**

Plans for instruction **build on each other to support students in discussing ideas about science concepts and phenomenon being investigated, and to test those ideas through the collection, analysis, and interpretation of scientific data.**

Plans for instruction **build on each other to support students to develop their own ideas about science concepts and phenomenon being investigated, to understand them in the context of a crosscutting concept, and to test those ideas through the collection, analysis, and interpretation of scientific data.**

Plans for instruction **build on each other to create a learning community where students work together to develop and refine common ideas about science concepts and the phenomenon being investigated in the context of a crosscutting concept, based on testing those ideas through the collection, analysis, and interpretation of scientific data.**

**NOTE:** Text representing differences between adjacent score levels is bolded. Evidence that does not meet Level 1 criteria is scored at Level 1.
## PLANNING: USING KNOWLEDGE OF STUDENTS TO INFORM TEACHING AND LEARNING

### S2: How does the candidate use knowledge of his/her students to target support for the development of students’ abilities to use science concepts and scientific inquiry skills to explain a real world phenomenon?

<table>
<thead>
<tr>
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<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning tasks do not reflect characteristics of students’ prior learning and experience.</td>
<td>Learning tasks reflect general characteristics of students’ prior learning and experience.</td>
<td>Learning tasks draw on students’ preconceptions and experience AND social/emotional development or interests.</td>
<td>Learning tasks draw upon students’ preconceptions and experience, social/emotional development, and interests.</td>
<td>Learning tasks draw upon and engage students in examining their own strengths from preconceptions and experience, social/emotional development, and interests.</td>
</tr>
<tr>
<td>There are no planned supports for students with varied needs.</td>
<td>Planned support consists of general strategies loosely tied to learning objectives or the central focus of the learning segment.</td>
<td>Planned support includes tasks/materials and/or scaffolding tied to learning objectives and the central focus with attention to the characteristics of the class as a whole and to requirements in IEPs and 504 plans.</td>
<td>Planned support includes a variety of tasks/materials and scaffolding tied to specific learning objectives and the central focus. Supports address the needs of specific individuals or groups with similar needs and include strategies to surface and respond to common preconceptions, errors and misunderstandings.</td>
<td>Planned support includes multiple ways of engaging with content that support students to meet specific standards/objectives within the central focus. Support is specifically designed to address a variety of student learning strengths and needs, and include specific strategies to surface and respond to common preconceptions, errors and misunderstandings.</td>
</tr>
<tr>
<td>Candidate’s justification of learning tasks is either missing OR represents a deficit view of students and their backgrounds.</td>
<td>Candidate justifies learning tasks with limited attention to students’ prior learning and experience.</td>
<td>Candidate uses examples of students’ preconceptions, prior learning, and experience to justify why learning tasks (or their adaptations) are appropriate.</td>
<td>Candidate uses examples from their students’ preconceptions, prior learning, and experience AND relevant research/theory to justify why learning tasks (or their adaptation) are appropriate.</td>
<td>Candidate justifies learning tasks by explaining their appropriateness for students’ preconceptions, prior learning, and experience and anticipated effects on new learning with support from relevant research and/or theory.</td>
</tr>
</tbody>
</table>

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2 “Prior learning and experience” includes students’ academic content knowledge, language development, family/cultural assets, and lived experiences.
### PLANNING: PLANNING ASSESSMENTS TO MONITOR AND SUPPORT STUDENT LEARNING

**S3:** How are the informal and formal assessments selected or designed to provide evidence of student progress toward the standards/objectives?

<table>
<thead>
<tr>
<th>Level 1</th>
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<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>The set of assessments are <strong>not aligned to the standards and learning objectives</strong> and will provide <strong>little or no evidence</strong> of students’ understandings of science concepts, phenomena, and scientific inquiry.</td>
<td>The set of assessments are <strong>loosely aligned to the standards and objectives</strong>, and provide <strong>limited evidence to monitor students’ understandings of science concepts, phenomena, and scientific inquiry during the learning segment.</strong></td>
<td>The set of assessments are <strong>aligned</strong> to the standards and objectives, and provide evidence for monitoring students’ understanding of science concepts, phenomena, and scientific inquiry <strong>at different points</strong> in the learning segment.</td>
<td>The set of assessments are aligned to the standards and objectives, and provide <strong>multiple forms of evidence for monitoring students’ progress toward developing understandings of science concepts, phenomena, and scientific inquiry throughout the learning segment.</strong></td>
<td>The set of assessments are <strong>strategically designed to provide multiple forms of evidence for monitoring student progress toward developing understandings of science concepts, phenomena, and scientific inquiry relative to the standards and objectives throughout the learning segment.</strong></td>
</tr>
</tbody>
</table>

OR

**Assessment accommodations or modifications required by IEP or 504 plans are NOT made.**
# Instruction Rubrics

<table>
<thead>
<tr>
<th>INSTRUCTION</th>
<th>ENGAGING STUDENTS IN LEARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>S4: How does the candidate actively engage students in collecting, analyzing, and interpreting scientific data to explain a real world phenomenon?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 1</th>
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<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the clips, students are participating in collecting and recording data to learn predetermined explanations of the scientific phenomenon.</td>
<td>In the clips, students are participating in collecting, analyzing, and interpreting data to construct explanations of a phenomenon.</td>
<td>In the clip(s), students are intellectually engaged in collecting, analyzing, and interpreting data, and using the data together with their understanding of science concepts to construct explanations of a phenomenon.</td>
<td>In the clip(s), students are intellectually engaged in collecting, analyzing, and interpreting data, and using the data, together with their understanding of science concepts, to construct and evaluate explanations of a phenomenon.</td>
<td>In the clip(s), students are intellectually engaged in collecting, analyzing, and interpreting data, and using the data, together with their understanding of science concepts, to talk with each other about issues related to data quality and to construct and evaluate explanations of a phenomenon.</td>
</tr>
</tbody>
</table>

There is little to no evidence that candidate attends to students’ prior learning and experiences.  
Candidate attempts to draw students’ attention to prior learning and their experiences.  
Candidate makes connections between students’ prior learning, their experiences, and the process of collecting, analyzing, and interpreting data.  
Candidate makes connections between students’ prior learning, their experiences, and the collection, analysis, and interpretation of data in ways that question students’ preconceptions of science concepts, the phenomenon, or scientific inquiry.  
Candidate prompt students to consider their prior learning, experiences, and the collection, analysis, and interpretation of data in ways that challenge their preconceptions of science concepts, the phenomenon, or scientific inquiry.

Student misbehavior or candidate’s disrespect for one or more students severely limits students’ engagement in learning OR there are safety violations visible on the videotape posing an immediate danger to students.  
If needed for the activity, safety measures are taken.  
If needed for the activity, safety measures are taken and enforced by the candidate.  
If needed for the activity, safety measures are taken and enforced by the candidate.  
If needed for the activity, safety measures are taken and enforced by the candidate.
## INSTRUCTION: DEEPENING STUDENT LEARNING

**S5:** How does the candidate elicit and monitor students’ responses to deepen their understanding of science concepts and scientific inquiry?

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Candidate does most of the talking in interactions with students in the clips.</td>
<td>Candidate primarily asks surface-level questions and evaluates student responses as correct or incorrect.</td>
<td>The candidate elicits student responses related to their understandings of science concepts, scientific inquiry, and the phenomenon being investigated.</td>
<td>Candidate elicits and builds on students’ own ideas about science concepts, scientific inquiry, and the phenomenon being investigated.</td>
<td>Candidate facilitates interactions among students to identify weaknesses and limitations of data collection procedures, interpretations, or explanations.</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials or candidate responses include significant science content inaccuracies or procedural errors that will lead to student misunderstandings and/or affect the quality of the data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Assessment Rubrics

### ASSESSMENT: ANALYZING STUDENT WORK

**S6: How does the candidate demonstrate an understanding of student performance with respect to standards/objectives?**

<table>
<thead>
<tr>
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<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria are <strong>not aligned with</strong> the identified standards/objectives.</td>
<td>Criteria are <strong>generally aligned with</strong> the standards/objectives from the learning segment.</td>
<td>Criteria are <strong>clearly aligned with</strong> standards/objectives from the learning segment.</td>
<td>Criteria are clearly aligned with standards/objectives from the learning segment. Criteria indicate <strong>qualitative differences in student performance.</strong></td>
<td>All components of Level 4 plus: The candidate is able to identify areas of strength in a predominantly weak performance and/or areas for improvement in a predominantly strong one.</td>
</tr>
</tbody>
</table>

The analysis is **superficial and/or vaguely connected** to identified standards and objectives. | The analysis **focuses only on student errors** in relation to identified standards/objectives. | The analysis **focuses on listing what students did right and wrong** in the application of science concepts AND/OR the collection, analysis, and interpretation of data in relation to identified standards/objectives. | The analysis **focuses on patterns of student understandings, skills, and misunderstandings** in relation to identified standards and learning objectives. The analysis **uses these patterns to understand student conceptual understanding and scientific thinking.** |

**OR**

The conclusions in the analysis are **not supported** by either student **work samples or the summary of performance.** | The analysis is **supported by work samples and the summary of performance in a general way.** | The analysis is supported by work samples and the summary of performance, with attention to **some differences in whole class learning** of different aspects of the content assessed. | The analysis is supported by work samples and the summary of performance, as well as **references to evidence in work samples to identify specific patterns of learning for individuals or groups.** |
### ASSESSMENT: USING FEEDBACK TO GUIDE FURTHER LEARNING

**S7: How does the candidate provide students feedback to guide their further learning?**

<table>
<thead>
<tr>
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<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback is unrelated to the learning objectives.</td>
<td>Feedback focuses solely on identifying errors aligned with the learning objectives.</td>
<td>Feedback accurately identifies general areas for what students did well and what they need to improve related to specific learning objectives.</td>
<td>Feedback is clear, specific and accurate, helps the student understand what s/he did well, and provides guidance for improvement.</td>
<td>All components of level 4 plus: Candidate describes how students will use feedback to deepen their scientific understandings and to evaluate their own work.</td>
</tr>
</tbody>
</table>

**Opportunities for applying feedback are not described.**

| Opportunities for applying feedback are not described. | Candidate describes how students will correct their errors. | Candidate describes how students will use feedback to improve their performance. | Candidate describes how students will use feedback to deepen their science understandings. | |

**OR**

The feedback contains significant content inaccuracies.
## ASSESSMENT: USING ASSESSMENT TO INFORM INSTRUCTION

**S8: How does the candidate use conclusions about what students know and are able to do to plan next steps in instruction?**

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Next steps do not follow from the analysis. OR Next steps are not relevant to the standards and learning objectives assessed. OR Next steps are not described in sufficient detail to understand them.</td>
<td>Next steps focus on re-teaching, pacing, or classroom management issues.</td>
<td>Next steps propose general support that improves student performance related to the standards and learning objectives assessed.</td>
<td>Next steps provide targeted support to individuals and groups to improve their performance relative to the standards and learning objectives assessed.</td>
<td>Next steps provide targeted support to individuals and groups to improve their performance relative to the standards and learning objectives assessed. Next steps extend student learning beyond what was assessed in the learning segment.</td>
</tr>
</tbody>
</table>
## Analyzing Teaching Rubric

### ANALYZING TEACHING EFFECTIVENESS

**S9: How does the candidate use evidence to evaluate and change teaching practice to meet the varied learning needs?**

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Candidate proposes changes unrelated to knowledge of students and their learning.</td>
<td>Proposed changes are focused primarily on improving directions for learning tasks or time management.</td>
<td>Proposed changes address students’ collective learning needs related to standards/objectives.</td>
<td>Proposed changes address some individual and collective learning needs related to science concepts, the phenomenon, the nature of science, and/or science inquiry.</td>
<td>Changes in teaching practice are specific and strategic to improve individual and collective student understanding of science concepts, the phenomenon, the nature of science, and/or science inquiry.</td>
</tr>
<tr>
<td><strong>OR</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Candidate does not propose any changes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Candidate proposes changes that are loosely related to student learning evidence OR are superficially related to knowledge of students’ prior learning and experiences.

Candidate cites evidence of student learning OR knowledge of students’ preconceptions, prior learning, and experiences to explain changes to teaching practices.

Candidate explains changes to teaching practices by citing:
- examples of successful and unsuccessful teaching practices
- evidence of learning
  - knowledge of students’ preconceptions, prior learning, and experiences

Candidate justifies changes to teaching practices by citing:
- examples of successful and unsuccessful teaching practices
- analysis of learning evidence
- nuanced knowledge of students’ preconceptions, prior learning and experiences.
## Academic Language in Science Rubrics

**ACADEMIC LANGUAGE: UNDERSTANDING STUDENTS’ LANGUAGE DEVELOPMENT AND ASSOCIATED LANGUAGE DEMANDS**

**S10:** How does the candidate use knowledge of students’ language development to identify a key language demand central to content learning?

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Candidate’s description of students’ academic language development is limited to what they CANNOT do.</td>
<td>Candidate’s description of students’ academic language development is primarily focused on needs.</td>
<td>Candidate’s description of students’ academic language development identifies strengths and needs.</td>
<td>Candidate’s description of students’ academic language development identifies strengths and needs and highlights individual or group differences.</td>
<td>Candidate’s description of students’ academic language development identifies needs as well as strengths that individual students or groups with similar needs can build upon.</td>
</tr>
</tbody>
</table>

**Vocabulary, symbols, or other identified language demands are only vaguely related to the academic purposes of the learning segment.**

<table>
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<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candidate identifies unfamiliar vocabulary (or symbols) in the learning segment without considering other language demands or purposes (functions/forms).</td>
<td>Candidate identifies vocabulary (and/or symbols) as well as a language demand (function/forms) that are central to the learning segment and appropriate to most students’ language development.</td>
<td>Candidate justifies why the selected language demand (function/forms) and vocabulary (and/or symbols) are central to the learning segment and to most students’ language development.</td>
<td>Candidate justifies why the selected language demand (function/forms) and vocabulary (and/or symbols) are central to the learning segment and to students’ varied levels of language development.</td>
<td></td>
</tr>
</tbody>
</table>
### ACADEMIC LANGUAGE: SCAFFOLDING STUDENTS’ ACADEMIC LANGUAGE AND DEEPENING CONTENT LEARNING

**S11: How does the candidate support academic language development associated with content learning?**

| Level | Language and/or content is oversimplified to the point of limiting student access to the core content of the learning segment. |
|-------|----------------------------------------------------------------------------------------------------------------|---|
| Level 1 | The candidate provides limited support for students to meet the selected language demand of the learning segment. |
| Level 2 | The candidate provides support so students can use language associated with the selected language demand necessary to engage in academic tasks. |
| Level 3 | The candidate provides explicit models and opportunities for practice so students can use language (associated with the language demand) to express and demonstrate content understandings. |
| Level 4 | The candidate provides explicit models, opportunities for practice, and feedback so students can use language (associated with the language demand) to express, develop, and demonstrate content understandings. |

### ACADEMIC LANGUAGE: DEVELOPING STUDENTS’ ACADEMIC LANGUAGE AND DEEPENING CONTENT LEARNING

**S12: How does the candidate reveal students’ understanding and use of academic language associated with content learning?**

| Level | Candidate identifies evidence (from video clip or assessment data) unrelated to the identified language demand. |
|-------|------------------------------------------------------------------------------------------------ |---|
| Level 1 | Candidate identifies limited evidence (from video clip or assessment data) that students had an opportunity to understand and use the identified academic language. |
| Level 2 | Candidate identifies evidence (from video clip or assessment data) that students are understanding and using targeted academic language in ways that support their language development and content learning. |
| Level 3 | Candidate identifies evidence (from video clip or assessment data) that students with varied strengths and needs are understanding and using targeted academic language in ways that support their language development and content learning. |
| Level 4 | Candidate identifies evidence (from video clip or assessment data) that students with varied strengths and needs are understanding and using targeted academic language in ways that support their language development and content learning. |
Glossary of Terms for Secondary Science

**Academic language** is oral and written language used for academic purposes. It is the language necessary for students to learn content in schools. Academic language is the means by which students develop and express content understandings. Academic language includes the “language of the discipline” (vocabulary and functions and forms of language associated with learning outcomes in a particular subject) and the “instructional language” used to engage students’ in learning content.

**Assessment (formal and informal):** Refers to all those activities undertaken by teachers, and by their students, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged. (See Black & Wiliam, 1998.) Assessments provide evidence of students' prior knowledge, thinking, or learning in order to evaluate what students understand and how they are thinking. Informal assessments may include such things as student questions and responses during instruction and teacher observations of students as they work. Formal assessments may include such things as quizzes, homework assignments, lab reports, papers, journals, and projects.

**Assessment Tools/Procedure:** Any method for strategically gathering evidence of student learning (e.g., observing students as they work, posing questions, or more formal written assessments that include evaluation criteria (e.g., rubrics).

**Central Focus:** Is a statement or phrase that captures or summarizes the overarching learning outcomes associated with content standards and learning objectives. It may not be as broad or comprehensive as a big idea or essential question used in a longer unit of instruction, but it should represent a focus beyond facts and skills. For example, the central focus for a science learning segment might be understanding factors producing genotypes and phenotypes. The learning segment would focus on conceptual understandings of genotypes, phenotypes, dominant genes, etc. and an investigation of how relationships between genotypes are expressed in phenotypes affect distributions of phenotypes in a population.

**Crosscutting concepts:** (formerly called unifying ideas) Concepts that unify the study of science and engineering through their common application across science fields. These are identified in A Framework for K-12 Science Education: Practices, Crosscutting concepts, and Core Ideas (National Academy of Sciences, 2011, prepublication edition, p. 4-1) as patterns; cause and effect; scale, proportion, and quantity; systems and systems models, energy and matter; structure and function; stability and change.

**Engaging students in learning:** Using instructional and motivational strategies that promote students’ active involvement in learning tasks that increase their knowledge, skills, and abilities related to specific learning objectives. Intellectual engagement in learning contrasts with student participation in learning tasks that are not well-designed and/or implemented and do not increase student learning.

**Evaluation Criteria:** Evaluation criteria are performance indicators or dimensions that are used to assess evidence of student learning. They indicate the qualities by which levels of performance can be differentiated, and that anchor judgments about the learner's degree of success on an assessment. Evaluation criteria can be represented in various ways, such as a rubric, a point system for different levels of performance, or rules for awarding full vs. partial credit. Evaluation criteria may examine correctness/accuracy, cognitive complexity, sophistication or elaboration of responses, or quality of explanations.

**Instructional language:** Language teachers use to direct student engagement in learning (task directions, routines, questions, explanations, etc.) AND language that students need to participate
with each other in a learning activity, task or discussion (questions, explanations, etc. used in whole class, small group, or partner interactions). Instructional language may or may not be subject specific.

**Language Demands:** Specific ways language (reading, writing, listening and speaking) will need to be used by students to participate in learning tasks and demonstrate their learning. Language demands vary by discipline and language function/form.

**Language Development:** Students’ language abilities in terms of speaking, listening, reading, and writing skills. All students, including high performing students, can improve their academic language proficiency in terms of precise language choices, more clear and/or complex communication, and greater fluency with discipline-specific language.

**Language Forms:** Structures or ways of organizing oral or written language serve a particular function within each subject area. In science, language forms include symbolic representations such as chemical equations (which can be translated into words), graphic and tabular representations (which is shorthand language for complex sets of data), lists (e.g., materials lists), and narrative (e.g., analysis and conclusions sections in a lab report). Language forms can be at the sentence, paragraph, whole text, or symbolic levels. If the function is to draw conclusions, then appropriate language forms to structure the content could include charts of investigative results or sentence starters to structure an analysis such as “The results of the investigation show…” “This suggests that…”

**Language Functions:** For oral and written language in classrooms, the function is the purpose the language is intended to achieve within each subject area. Functions are associated with verbs found in learning outcome statements. Common language functions in science include reading investigative procedures, diagrams, figures, tables, graphs, and dense authoritative text; writing or presenting causal explanations; modeling scientific phenomena; predicting from models and data from scientific inquiries; comparing based on common attributes, summarizing scientific data from inquiries; justifying conclusions with scientific evidence; evaluating data and investigative procedures, classifying based on attributes; describing processes and procedures; drawing conclusions based on investigative results, etc.

**Learning objectives:** Student learning outcomes to be achieved by the end of the lesson or learning segment.

**Learning segment:** A set of 3-5 lessons that build one upon another toward a central focus, with a clearly defined beginning and end.

**Nature of science:** Science is a set of practices that show that theory development, reasoning, and testing are components of a larger ensemble of activities that includes networks of participants and institutions; specialized ways of talking and writing; the development of models to represent systems or phenomena; the making of predictive inferences; construction of appropriate instrumentation; and testing of hypotheses by experiment or observation. (National Academy of Sciences, 2011, prepublication version, p. 3-2). Science teachers create a community of learners who learn how to work together to develop, test, refine, and share scientific ideas based on evidence about how the biological and physical worlds work.

**Preconceptions:** Student ideas about the physical and biological worlds and how they work or about the nature of science, based on their observations, experiences, and what they have heard.

**Prior learning and experience:** Includes students’ academic content knowledge, language development, social/emotional development, family/cultural assets, interests and lived experiences.
**Scaffolding:** A special type of instructional support to allow students to do a task that they cannot yet do independently. Like scaffolding for buildings under construction, the support is designed to be temporary and to be removed or gradually reduced as students learn to do the task by themselves.

**Scientific inquiry:** In secondary science, this is the process of solving genuine scientific problems with uncertain outcomes (from the students’ perspective) by observing, collecting, and analyzing scientific data in order to construct and evaluate inferences from that data to explain a scientific phenomenon. The teacher provides varied degrees of assistance in defining the problem, designing the investigation/inquiry, and making sense of the outcomes as students learn to conduct scientific inquiry independently.

**Social and Emotional Development:** Refers to the ways in which children and adolescents develop understandings of self and others. Milestones at various levels of development include identity formation, self-awareness/self concept, pro-social behavior, peer relationships, social responsibility, and moral reasoning.

**Special needs:** Refers to categories addressed by federal law (Individuals with Disabilities Act), identified learning disabilities, gifted and talented, and other features of student learning that may require individualized instruction or assessment.
Context for Learning Information

The Context for Learning Information is included in this Pre-Release Handbook. It will be moved to a template in the Field Test Final Handbook.

About the School Where You Are Teaching

1. In what type of school do you teach?
   
   _____ Middle school  ______ High school
   _____ Other (please describe)

2. List any special features of your school or classroom setting (e.g., themed magnet, remedial course, honors course) that will affect your teaching in this learning segment.

3. Describe any district, school, or cooperating teacher requirements or expectations that might affect your planning or delivery of instruction, such as required curricula, pacing plan, use of specific instructional strategies, or standardized tests.

About the Class Featured in This Assessment

1. What is the name of the course? ______________________________

2. What is the length of the course?
   - □ One semester
   - □ One year
   - □ Other (please describe) ______________________________

3. What is the class schedule (e.g., 50 minutes every day, 90 minutes every other day)?

4. Is there any ability grouping or tracking in science? If so, please describe how it affects your class.

5. Identify any textbook or instructional program you primarily use for science instruction. If a textbook, please provide the title, publisher, and date of publication.

6. List other resources (e.g., SmartBoard, graphing calculators, on-line resources) you use for science instruction in this class.

About the Students in the Class Featured in This Assessment

1. Grade level composition (e.g., all seventh grade; 2 sophomores and 30 juniors)

2. Number of
   - □ students in the class _____
   - □ males _____ females _____
   - □ English language learners____
   - □ students with Individualized Education Programs (IEPs) or 504 plans____

3. Complete the chart below to summarize required accommodations or modifications for students receiving special education services and/or students who are gifted and talented as they will affect your science instruction in this learning segment. As needed, consult with your cooperating teacher to complete the chart. The first row has been completed in italics as an example. Use as many rows as you need.
<table>
<thead>
<tr>
<th>Special Education Category</th>
<th>Number of Students</th>
<th>Accommodations, Modifications and or Pertinent IEP Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example: Learning Disability</td>
<td>Example: 4</td>
<td>Example: Close monitoring, follow up, and Resource Room</td>
</tr>
</tbody>
</table>