Next Generation Science Standards (NGSS) and edTPA Crosswalk
Overview with detailed rubric and prompt text[1]

The Next Generation Science Standards,[2] are organized along three dimensions: 1) practices, 2) crosscutting concepts, and 3) disciplinary core ideas. The second and third dimensions are particular to the content being taught. The practices represent a dimension of science[3] learning that cuts across science topics. They are:

1. Asking questions
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

As stated in Appendix F of the *Next Generation Science Standards*:

> **The eight practices are not separate; they intentionally overlap and interconnect.** As explained by Bell, et al. (2012), the eight practices do not operate in isolation. Rather, they tend to unfold sequentially, and even overlap. For example, the practice of "asking questions" may lead to the practice of "modeling" or "planning and carrying out an investigation," which in turn may lead to "analyzing and interpreting data." The practice of "mathematical and computational thinking" may include some aspects of "analyzing and interpreting data." Just as it is important for students to carry out each of the individual practices, it is important for them to see the connections among the eight practices.

edTPA Secondary Science (SES) incorporates the eight NGSS science practices. As noted in the "Overview of the Assessment," p. 1 of the SES handbook, the focus of the assessment is as follows:

> "For this assessment, you will first plan **3–5 consecutive science lessons** (or, if teaching science within a large time block, **3–5 hours of connected instruction**) referred to as a learning segment. Consistent with *A Framework for K–12 Science Education: Practices, Crosscutting Concepts, and Core Ideas* (NRC 2011)[4] and aligned with the *Next Generation Science Standards*, prepare a learning segment for this assessment that reflects a balanced approach to science, including opportunities for students to develop their abilities to use scientific concepts and apply scientific practices through inquiry to explain a real-world phenomenon.

In edTPA Secondary Science, every rubric that focuses on subject-specific pedagogy related to science teaching (as opposed to those focused on more generic skills such as using knowledge of students and research or theory to justify plans) incorporates the NGSS scientific practices into the rubric. Some of the subject-specific rubrics generally refer to the "application of scientific practices during inquiry"; others mention a particular scientific practice (e.g., analyzing and interpreting data). It is important to keep in mind that even rubrics measuring more generic skills (i.e., those not measuring subject-specific pedagogy) are embedded in a context of an investigation of a science phenomenon where students are to use concepts and the scientific practices to construct evidence-based explanations and/or arguments.

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[2] The *Next Generation Science Standards* are available on the NGSS website, http://www.nextgenscience.org/*next-generation-science-standards*.

[3] The first and fifth practices are defined differently for engineering learning.

[4] *A Framework for K–12 Science Education: Practices, Crosscutting Concepts, and Core Ideas* can be found at http://www.nap.edu/openbook.php?record_id=13165.

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Note: The experience of edTPA (based on the directions, prompts, teaching of the learning segment, analysis of teaching) allows candidates to PRACTICE teaching performance required in the NGSS even if not all components of each element and/or standard are measured directly.

edTPA Task	edTPA Rubric	NGSS Practices							
		1. *Askg Q's & Def. pblms*	2. *Dev & Using Models*	3. *Plng & Carrying out Inv.*	4. *Anal. & Interp. Data*	5. *Using Math & Comp. thkg*	6. *Constrct. Explan & Des. Solns*	7. *Engaging in Arg. From Evid.*	8. Obtaining, eval., & comm. info.
Task 1: Planning	*1: Planning for Content Understandings*			√			√	√	√
	2: Planning to Support Varied Student Needs								
	3: Using Knowledge of Students to Inform Planning								
	4: Identifying and Supporting Language Demands								
	5: Planning Assessments to Monitor And Support Student Learning								
Task 2: Instruction	*6: Demonstrating a Positive and Engaging Learning Environment*								
	7: Engaging Students in Learning				√		√	√	√
	8: Deepening Student Learning While Teaching						√		√
	9: Subject Specific Pedagogy: Science				√				
	10: Analyzing Teaching								
Task 3: Assessment	*11: Analyzing Student Work*								
	12: Providing Feedback to Guide Learning								
	13: Supporting Students' Use of Feedback								
	14: Evidence of Language Use to Support Content Understandings						√		
	15: Using Assessment to Inform Instruction							√	

Next Generation Science Standards (NGSS) and edTPA Crosswalk

Note: The experience of edTPA (based on the directions, prompts, teaching of the learning segment, analysis of teaching) allows candidates to PRACTICE teaching performance required in the OSTP even if not all components of each element and/or standard are measured directly.

Abbreviation Key: AC = Assessment Commentary IC = Instruction Commentary PC = Planning Commentary R = Rubric

The rubric language represents Level 3 unless otherwise indicated.

NGSS practices	edTPA	Text of Associated edTPA Prompts and Rubrics
3. Planning and carrying out investigations	R1	Candidate's plans for instruction build on each other to support students" . . . investigation of a phenomenon, AND generation of explanations through engagement in scientific practices through inquiry
	PC	Describe how the standards and learning objectives within your learning segment address the use of science concepts and the ability to apply scientific practices through inquiry
	PC	Describe how your planned formal and informal assessments will provide direct evidence of students' understanding of . . . the application of scientific practices through inquiry
4. Analyzing and interpreting data	R7	Candidate supports students in constructing a scientific argument and students refer to data
	R9	**Level 4** Candidate asks students to display data and facilitates a data analysis discussion where students demonstrate the ability to find patterns OR inconsistencies within the data
	IC	Explain how your instruction engaged students during a scientific inquiry in using data and science concepts to construct an evidence-based explanation of a real-world phenomenon during a scientific inquiry AND explaining how data & relevant science concepts support their claims
	PC	Language Function. From the list below, choose one language function essential for student learning within your central focus: analyze, explain, interpret, justify with evidence
	AC	Explain how you elicited and built on student responses to promote thinking and develop understandings of science concepts, scientific practices and inquiry, AND the phenomenon being investigated Explain how you facilitated your students' organization and analysis of data (i.e., looking for patterns, identifying outliers, and/or exploring similarities and differences in findings) during a scientific inquiry
6. Constructing explanations and designing solutions	R1	Candidate's plans for instruction build on each other to support students' . . . generation of explanations through engagement in scientific practices through inquiry
	PC	Describe how the standards and learning objectives . . . apply scientific practices through inquiry to develop evidence-based explanations for a real-world phenomenon
	PC	Explain how your plans build on each other to help students understand relationships between scientific concepts, scientific practices, and the phenomenon in the learning segment
	PC	Language Function. From the list below, choose one language function essential for student learning within your central focus: analyze, explain, interpret, justify with evidence
	R7	Candidate supports students in constructing a scientific argument and students refer to data OR acceptable science concepts but do not explain how they support the argument. Candidate links prior academic learning to new learning **Level 4** Candidate supports students in constructing an evidence-based argument and students explain how data AND acceptable science concepts support the argument
	R8	Candidate elicits student responses related to understanding science concepts, scientific practices and inquiry, AND the phenomenon being investigated
	IC	Explain how your instruction engaged students during a scientific inquiry in using data and science concepts to construct an evidence-based explanation of a real-world phenomenon during a scientific inquiry AND explaining how data & relevant science concepts support their claims
	R14	**Level 4** Candidate explains and provides concrete evidence of students' use of: the language function, vocabulary, AND additional language demand(s) (syntax, discourse) in ways that develop content understandings

	AC	The assessment should provide opportunities for students to demonstrate . . . use of scientific practices during inquiry and evidence-based argument about a scientific phenomenon
	AC	Explain how you elicited and built on student responses to promote thinking and develop understandings of science concepts, scientific practices and inquiry, AND the phenomenon being investigated Explain how you facilitated your students' organization and analysis of data (i.e., looking for patterns, identifying outliers, and/or exploring similarities and differences in findings) during a scientific inquiry
7. Engaging in argument from evidence	R1	**Level 4** Candidate's plans for instruction build on each other to support students' . . .generation of evidence-based arguments
	PC	Describe how the standards and learning objectives . . . apply scientific practices through inquiry to develop evidence-based explanations for a real-world phenomenon
	PC	Language Function. From the list below, choose one language function essential for student learning within your central focus: analyze, explain, interpret, justify with evidence
	R7	**Level 4** Candidate supports students in constructing an evidence-based argument and students explain how data AND acceptable science concepts support the argument
	IC	Explain how your instruction engaged students during a scientific inquiry in . . . explaining how data and relevant science concepts support their claims
	R15	**Level 4** Next steps provide targeted support to individuals or groups to improve their learning relative to . . . evidence-based argument about a scientific phenomenon
	AC	The assessment should provide opportunities for students to demonstrate evidence-based argument about a scientific phenomenon
	AC	Explain how you elicited and built on student responses to promote thinking and develop understandings of science concepts, scientific practices and inquiry, AND the phenomenon being investigated Explain how you facilitated your students' organization and analysis of data (i.e., looking for patterns, identifying outliers, and/or exploring similarities and differences in findings) during a scientific inquiry
8. Obtaining, evaluating, and communicating information	R1	Candidate's plans for instruction build on each other to support students': Learning of science concepts, investigation of a phenomenon, AND generation of explanations through engagement in scientific practices through inquiry
	PC	Address the use of science concepts and the ability to apply scientific practices through inquiry to develop evidence-based explanations for a real-world phenomenon
	PC	Language Function. From the list below, choose one language function essential for student learning within your central focus: analyze, explain, interpret, justify with evidence
	R7	Candidate supports students in constructing a scientific argument and students refer to data OR acceptable science concepts but do not explain how they support the argument. Candidate links prior academic learning to new learning
	IC	Explain how your instruction engaged students during a scientific inquiry in using data and science concepts to construct an evidence-based explanation of a real-world phenomenon during a scientific inquiry and explaining how data & relevant science concepts support their claims
	R8	Candidate elicits student responses related to understanding, science concepts, scientific practices and inquiry, AND the phenomenon being investigated
	AC	Explain how you elicited and built on student responses to promote thinking and develop understandings of science concepts, scientific practices and inquiry, AND the phenomenon being investigated Explain how you facilitated your students' organization and analysis of data (i.e., looking for patterns, identifying outliers, and/or exploring similarities and differences in findings) during a scientific inquiry