



# Understanding Rubric Level Progressions

## Technology and Engineering Education Version 02

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### Candidate Support Resource

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**SCALE**

Stanford Center for Assessment, Learning, & Equity

URLP\_TED\_v02

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## Overview

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edTPA's portfolio is a collection of authentic artifacts and evidence from a candidate's actual teaching practice. *Understanding Rubric Level Progressions* (URLP) is a KEY resource that is designed to describe the meaning behind the rubrics. A close read of the following URLP sections will help program faculty and supervisors internalize the criteria and level distinctions for each rubric.

This document is intended as a resource for program faculty and supervisors who are supporting candidates with edTPA. Faculty and supervisors are strongly encouraged to share this document with candidates and use it to support their understanding of the rubrics, as well as their development as new professionals. The *Understanding Rubric Level Progressions* is intended to enhance, not replace, the support that candidates receive from programs in their preparation for edTPA.

In the next section, we provide definitions and guidelines for making scoring decisions. The remainder of the document presents the score-level distinctions and other information for each edTPA rubric, including:

1. Elaborated explanations for rubric Guiding Questions
2. Definitions of key terms used in rubrics
3. Primary sources of evidence for each rubric
4. Rubric-specific scoring decision rules
5. Examples that distinguish between levels for each rubric: Level 3, below 3 (Levels 1 and 2), and above 3 (Levels 4 and 5).

### Scoring Decision Rules

When evidence falls across multiple levels of the rubric, scorers use the following criteria while making the scoring decision:

1. **Preponderance of Evidence:** When scoring each rubric, scorers must make score decisions based on the evidence provided by candidates and how it matches the rubric level criteria. A pattern of evidence supporting a particular score level has a heavier weight than isolated evidence in another score level.
2. **Multiple Criteria:** In cases where there are two criteria present across rubric levels, greater weight or consideration will be for the criterion named as "primary."
3. **Automatic 1:** Some rubrics have Automatic 1 criteria. These criteria outweigh all other criteria in the specific rubric, as they reflect essential practices related to particular guiding questions. NOTE: Not all criteria for Level 1 are Automatic 1s.

#### **TECHNOLOGY AND ENGINEERING EDUCATION LEARNING SEGMENT FOCUS:**

Candidate's instruction should support students to develop technology-related conceptual understanding, technical skills, and engineering design or other problem-solving strategies.

# Planning Rubric 1: Planning for Technology and Engineering Understandings

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**TED1: How do the candidate's plans build students' technology-related conceptual understanding, technical skills, and engineering design or other problem-solving strategies?**

## The Guiding Question

The Guiding Question addresses how a candidate's plans build a learning segment of three to five lessons around a central focus. Candidates will explain how they plan to organize tasks, activities, and/or materials to align with the central focus and the standards/objectives. The planned learning segment must develop **students' technology-related conceptual understanding, technical skills, and engineering design or other problem-solving strategies**.

## Key Concepts of Rubric:

- *Aligned*—Standards, objectives, instructional strategies and learning tasks are "aligned" when they consistently address the same/similar learning outcomes for students.
- *Significant content inaccuracies*—Content flaws in commentary explanations, lesson plans, or instructional materials that will lead to student misunderstandings and the need for reteaching.

## Terms Central to the edTPA:

- *Technology-related conceptual understanding*—Students demonstrate conceptual understanding in technology and engineering when they recognize and can integrate the core concepts, systems, resources, requirements, optimization and trade-offs, processes, and controls.<sup>1</sup> This is often done through design activities that also involve analysis to model systems and predict outcomes, concern for human values (both individual and societal), and the communication of design ideas.
- *Technical skills*—Acquired abilities to choose, use, and maintain tools and processes to complete a task.
- *Engineering design process/technological design process*—At its infancy, the process includes identifying a problem, looking for ideas, developing solutions, and sharing the solution with others. Although there is no "right" process, common items in this iterative approach are: (a) Identifying the problem; (b) Defining the working criteria/goals; (c) Researching and gathering data; (d) Brainstorming/generating creative ideas; (e) Analyzing potential solutions; (f) Developing and testing models; (g) Making the decision; (h) Communicating and specifying; (i) Implementing and commercializing; and (j) Performing post-implementation review and assessment. It is important in any design process, however, that students perform the necessary analysis, mathematical and scientific predictions, and optimization needed to solve the problem.<sup>2</sup>

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<sup>1</sup> International Technology Education Association. (2007). *Standards for technological literacy: Content for the study of technology*. Reston, VA: Author. Retrieved from <https://www.iteea.org/File.aspx?id=67767&v=b26b7852>

<sup>2</sup> International Technology Education Association. (2007). *Standards for technological literacy: Content for the study of technology*. Reston, VA: Author. Retrieved from <https://www.iteea.org/File.aspx?id=67767&v=b26b7852>

### Primary Sources of Evidence:

Context for Learning Information

Planning Commentary **Prompt 1**

Strategic review of Lesson Plans & Instructional Materials

## Scoring Decision Rules

▶ <b>Multiple Criteria</b>	■ N/A for this rubric
▶ <b>AUTOMATIC 1</b>	■ Pattern of <b>significant content inaccuracies</b> that are core to the central focus or a key learning objective for the learning segment ■ A pattern of misalignment is demonstrated in relation to standards/objectives, learning tasks and materials across two or more lessons.

## Unpacking Rubric Levels

### Level 3

#### Evidence that demonstrates performance at Level 3:

- Plans for instruction are **logically sequenced** to facilitate students' learning.
- Plans are presented in a linear sequence in which **each lesson builds on the previous one(s)** OR a nonlinear sequence, e.g., when a problem or design task is posed and students develop an understanding of technology-related concepts and technical skills by using engineering design principles or other problem-solving strategies to explore the problem.
- In addition, the sequencing of the plans supports students' learning by connecting technical skills to technology-related concepts **OR** engineering design principles or other problem-solving strategies during the learning segment. **These connections are explicitly written in the plans or commentary**, and how the connections are made is not left to the determination of the scorer.
- Be sure to pay attention to **each component** of the subject-specific emphasis (technology-related concepts, technical skills, plus engineering design or other problem-solving strategies).

### Below 3

#### Evidence that demonstrates performance below 3:

- Plans for instruction support student learning of technical skills, but **with little or no** planned instruction to guide understanding of the underlying technology-related concepts or why engineering design or other problem-solving strategies work.

#### What distinguishes a Level 2 from a Level 3: At a Level 2,

- The candidate is paying some attention to helping students understand how to apply technical skills, but the **connections** to technology-related concepts or engineering design principles or other problem-solving strategies **are fleeting or vague**, so that students are largely left to make sense of these on their own.

**What distinguishes a Level 1 from a Level 2:** At a Level 1,

- The candidate is **focused on teaching technical skills** where there is little or no attention to assisting students in understanding the technology-related concepts, engineering design principles or other problem-solving strategies.

**Automatic Score of 1 is given when:**

- There is a pattern of **significant content inaccuracies** that will lead to student misunderstandings. Content flaws in the plans or instructional materials are significant and systematic, and interfere with student learning.
- **Standards, objectives, learning tasks, and materials are not aligned** with each other. There is a pattern of misalignment across two or more lessons. If one standard or objective does not align within the learning segment, this level of misalignment is not significant enough for a Level 1.

**Above 3**

**Evidence that demonstrates performance above Level 3:**

- Learning tasks are designed to support students to make clear, **consistent** connections between technology-related concepts, technical skills, AND engineering design principles or other problem-solving strategies.
- Consistent connections require students to routinely apply understandings of technology-related concepts and explain their application of engineering design principles or other problem-solving strategies as they use technical skills throughout the entire learning segment (all lessons).

**What distinguishes a Level 4 from a Level 3:** At a Level 4,

- In the commentary, the candidate addresses connections between and among technology-related concepts, technical skills, and engineering design principles or other problem-solving strategies **in every lesson**. Be sure to pay attention to each component of the subject-specific emphasis (technology-related concepts, technical skills, plus engineering design principles or other problem-solving strategies).
- The candidate uses these connections **to deepen student understanding of the central focus**.

**What distinguishes a Level 5 from a Level 4:** At a Level 5, the candidate meets all of Level 4 **AND**

- **Plans include activities and questions that will clearly support students in making these connections themselves.**
- This would include **plans that pose strategic problems and/or questions that lead students to make the connections** and/or plans where **students develop the habit** of:
  - Looking for connections between technical skills, technology-related concepts, and the engineering design and/or other problem-solving strategies;
  - Justifying the steps in a solution; and/or
  - Identifying and correcting errors in their design or solution strategy

## Planning Rubric 2: Planning to Support Varied Student Learning Needs

**TED2: How does the candidate use knowledge of his/her students to target support for students to develop technology-related conceptual understanding, technical skills, and engineering design or other problem-solving strategies?**

### The Guiding Question

The Guiding Question addresses how the candidate plans to support students in relationship to students' characteristics. This includes using the candidate's understanding of students to develop, choose, or adapt instructional strategies, learning tasks and materials.

### Key Concepts of Rubric:

- Planned Supports include instructional strategies, learning tasks and materials, and other resources deliberately designed to facilitate student learning of the central focus.

#### Primary Sources of Evidence:

Context for Learning Information (required supports, modifications, or accommodations)

Planning Commentary **Prompts 2 and 3**

Strategic review of lesson plans and instructional materials to clarify planned supports.

### Scoring Decision Rules

▶ <b>Multiple Criteria</b>	■ N/A for this rubric
▶ <b>AUTOMATIC 1</b>	■ Planned support according to requirements in IEP or 504 plans is completely missing. ■ If there are no students with IEPs or 504 plans, then this criterion is not applicable.

### Unpacking Rubric Levels

#### Level 3

#### Evidence that demonstrates performance at Level 3:

- Candidate explains how planned supports for students address the learning needs of the whole class while assisting them in achieving the learning objectives.
- Candidate addresses at least one of the requirements from IEPs and 504 plans as described in the Context for Learning Information.
- Requirements must be explicitly addressed in the commentary and/or the Planning Task 1 artifacts. List of requirements and/or accommodations in the Context for Learning Information document is not sufficient by itself.

## Below 3

### Evidence that demonstrates performance below 3:

- Candidate plans insufficient supports to develop students' learning relative to the learning objectives or the central focus. Evidenced by ONE or more of the following:
  - Candidate does not plan supports for students.
  - Planned supports are not closely tied to learning objectives or the central focus.
  - Evidence does not reflect ANY instructional requirement in IEPs or 504 plans.

### What distinguishes a Level 2 from a Level 3: At Level 2,

- Plans address at least one instructional requirement set forth in IEPs and 504 plans. However, it is not clear that other planned supports will be helpful in supporting students to meet the learning objectives.
- The supports would work for almost any learning objective. Therefore, supports are not closely connected to the learning objectives or central focus (e.g., pair high and low students during partner work without a specific description of how that supports students with a specific need, check on students who are usually having trouble, without any specific indication of what the candidate might be checking for, such as using engineering design principles or other problem-solving strategies to inform an initial solution to a design problem).
- Supports are tied to learning objectives within each lesson, but there is no central focus.

### What distinguishes a Level 1 from a Level 2: At Level 1,

- Evidence of intentional support for students' needs as described by the candidate is absent.

### Automatic Score of 1:

- If IEP/504 requirements are described in the Context for Learning or commentary but none are included in the planned support, then the rubric is scored as an Automatic Level 1, regardless of other evidence of support for the whole class or groups or individuals in the class. If the candidate describes one or more of the IEP or 504 plan requirements for any student in the lesson plans or commentary, then the score is determined by the Planned Support criterion. **(If there are no students with IEPs or 504 plans, then this criterion is not applicable.)**

## Above 3

### Evidence that demonstrates performance above 3:

- Plans address specific student needs (beyond those required in IEP and 504 plans) by including descriptions of scaffolding or structured supports that are explicitly selected or developed to help individual students and groups of students with similar needs to gain access to content and meet the learning objectives.

### What distinguishes a Level 4 from a Level 3: At Level 4,

- The candidate explains how the supports tied to the learning objectives are intended to meet specific needs of individuals or groups of students with similar needs, in addition to the whole class. Supports should be provided for more than one student—either more than one individual or for a specific group of students with similar needs (e.g., more instruction in a prerequisite skill).

**What distinguishes a Level 5 from a Level 4: At Level 5, the candidate meets Level 4  
AND**

- ALSO identifies possible preconceptions, common errors, or misunderstandings associated with the central focus, and describes specific strategies to identify and respond to them.
- If the plans and commentary attend to preconceptions, common errors or misunderstandings without also satisfying Level 4 requirements, this is not sufficient evidence for Level 5.

## Planning Rubric 3: Using Knowledge of Students to Inform Teaching and Learning

**TED3: How does the candidate use knowledge of his/her students to justify instructional plans?**

### The Guiding Question

The Guiding Question addresses how the candidate justifies the ways in which learning tasks and materials make content meaningful to students, by drawing upon knowledge of individuals or groups, as well as research or theory.

### Key Concepts of Rubric:

- *Deficit thinking*—is revealed when candidates explain low academic performance based primarily on students' cultural or linguistic backgrounds, the challenges they face outside of school or from lack of family support. When this leads to a pattern of low expectations, not taking responsibility for providing appropriate support, or not acknowledging any student strengths, this is a deficit view.

For the following terms from the rubric, see the handbook glossary:

- *Prior academic learning*
- *Assets* (personal, cultural, community)

### Primary Sources of Evidence:

Planning Commentary **Prompts 2 and 3**

### Scoring Decision Rules

▶ <b>Multiple Criteria</b>	<ul style="list-style-type: none"><li>▪ Criterion 1 (<b>primary</b>): Justification of plans using knowledge of students—i.e., prior academic learning <b>AND/OR</b> assets (personal, cultural, community)</li><li>▪ Criterion 2: Research and theory connections</li><li>▪ Place greater weight or consideration on criterion 1 (justification of plans using knowledge of students).</li></ul>
▶ <b>AUTOMATIC 1</b>	<ul style="list-style-type: none"><li>▪ Deficit view of students and their backgrounds</li></ul>

### Unpacking Rubric Levels

#### Level 3

**Evidence that demonstrates performance at Level 3:**

- *Primary Criterion*: The candidate explains how the learning tasks are explicitly connected to the students' prior academic knowledge OR knowledge of students' assets (personal, cultural, community). Assets include students' cultural and linguistic backgrounds, interests, community or family resources and personal experiences.
- *Secondary Criterion*: The candidate refers to research or theory in relation to the plans to support student learning. The connections between the research/theory and the tasks are superficial/not clearly made. They are not well connected to a particular element of the instructional design.

- If evidence meets the primary criterion at Level 3, the rubric is scored at Level 3 **regardless of the evidence for the secondary criterion.**
- If evidence meets the primary criterion at Level 4, and candidate has NO connection to research/theory, the rubric is scored at Level 3.

### Below 3

#### Evidence that demonstrates performance below 3:

- There is a limited amount of evidence that the candidate has considered his/her particular class in planning. OR
- The candidate justifies the plans through a deficit view of students and their backgrounds.

#### What distinguishes a Level 2 from a Level 3: At Level 2,

- The candidate's justification of the learning tasks makes some connection with what they know about students' prior academic learning OR assets (personal, cultural, community). These connections are not strong, but are instead vague or unelaborated, or involve a listing of what candidates know about their students in terms of prior knowledge or background without making a direct connection to how this information was used to inform planning.

#### What distinguishes a Level 1 from a Level 2: At Level 1,

- There is no evidence that the candidate uses knowledge of students to plan.

#### Automatic Score of 1 is given when:

- Candidate's justification of learning tasks includes a pattern representing a deficit view of students and their backgrounds. (See the explanation of deficit thinking listed above under Key Concepts of Rubric.)

### Above 3

#### Evidence that demonstrates performance above 3:

- The candidate's justification not only uses knowledge of students—as both academic learners AND as individuals who bring in personal, cultural, or community assets—but also uses research or theory to inform planning.

#### What distinguishes a Level 4 from a Level 3: At Level 4,

- The evidence includes specific examples from students' prior academic learning **AND** knowledge of students' assets (personal, cultural, community), and explains how the plans reflect this knowledge. The explanation needs to include **explicit connections** between the learning tasks and the examples provided.
- The candidate explains how research or theory informed the selection or design of at least one learning task or the way in which it was implemented. The connection between the research or theory and the learning task(s) must be explicit.
- Scoring decision rules: To score at Level 4, the candidate must meet the primary criterion at Level 4 and make at least a fleeting, relevant reference to research or theory (meet the secondary criterion at least at Level 3).

**What distinguishes a Level 5 from a Level 4:** At Level 5, the candidate meets Level 4  
**AND**

- Explains how principles of research or theory support or **set a foundation for** their planning decisions.
  - The justifications are explicit, well-articulated, and demonstrate a thorough understanding of the research/theory principles that are clearly reflected in the plans.

## Planning Rubric 4: Identifying and Supporting Language Demands

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**TED4: How does the candidate identify and support language demands associated with a key technology and engineering education learning task?**

### The Guiding Question

The Guiding Question focuses on how the candidate describes the planned instructional supports that address the identified language demands for the learning task.

### Key Concepts of Rubric:

Use the definitions below and the subject-specific Academic Language handout to further clarify concepts on Rubric 4.

- **language demands**—Specific ways that academic language (vocabulary and/or symbols, functions, discourse, syntax, visual representation) is used by students to participate in learning tasks through reading, writing, listening, and/or speaking to demonstrate their disciplinary understanding.
- **language functions**—Purpose for which language is used. The content and language focus of the learning task, often represented by the active verbs within the learning outcomes. Common language functions in technology and engineering education include **describing** phenomena, **predicting** from models and data, **comparing** based on common attributes, **summarizing** information in schematics, charts, or graphs, **justifying** conclusions, **evaluating** data and visual representations, **classifying** based on attributes, **explaining** phenomena and processes, **drawing conclusions** based on data, and so on.
- **vocabulary**—Words and phrases that are used within disciplines including: (1) words and phrases with subject-specific meanings that differ from meanings used in everyday life (e.g., table, solution, code); (2) general academic vocabulary used across disciplines (e.g., compare, analyze, evaluate); and (3) subject-specific words defined for use in the discipline.
- **discourse**—How members of the discipline talk, write, and participate in knowledge construction, using the structures of written and oral language. Discipline-specific discourse has distinctive features or ways of structuring oral or written language (text structures) or representing knowledge visually that provide useful ways for the content to be communicated.<sup>3</sup> In technology and engineering, language structures include graphic representation (including schematics, drawings, and physical models), and narrative structures (e.g., critiques, research reports, implementation reviews). If the language function is to critique a design, the critique would be structured to include sections about the options considered, rationale for choices made, and how well the design meets the established criteria.<sup>4</sup>

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<sup>3</sup> Quinn, H., Lee, O., & Valdés, G. (2012). Language demands and opportunities in relation to next generation science standards for ELLs. Retrieved from <http://ell.stanford.edu/sites/default/files/pdf/academic-papers/03-Quinn%20Lee%20Valdes%20Language%20and%20Opportunities%20in%20Science%20FINAL.pdf>

<sup>4</sup> Examples for glossary terms in the Technology and Engineering Education Handbook will represent content areas, such as mathematics or science, instead of technologies, due to the fact that technology and engineering are the tools through which content area understandings are achieved.

- **syntax**—The rules for organizing words or symbols together into phrases, clauses, sentences or visual representations (e.g., graphs, tables, schematics). One of the main functions of syntax is to organize language in order to convey meaning.
- **language supports**—The scaffolds, representations, and pedagogical strategies teachers intentionally provide to help learners understand and use the concepts and language they need to learn within disciplines. The language supports planned within the lessons in edTPA should directly support learners to understand and use identified language demands (vocabulary and/or symbols, language function, visual representation, and syntax or discourse) to deepen content understandings.

### Primary Sources of Evidence:

Planning Commentary **Prompt 4a–d**

Strategic review of Lesson Plans

## Scoring Decision Rules

▶ <b>Multiple Criteria</b>	■ N/A
▶ <b>AUTOMATIC 1</b>	■ None

## Unpacking Rubric Levels

### Level 3

#### Evidence that demonstrates performance at Level 3:

- General supports are planned and described, though not in specific detail, for students' application of any two or more of the language demands (function, vocabulary and/or symbols, syntax, discourse, visual representation).
  - Language supports must go beyond opportunities for students to practice using the identified language demands either individually or with other students within the learning segment. Examples of general language supports include describing and defining the function, modeling vocabulary, syntax or discourse, providing an example with little explanation, questions and answers about a language demand, whole group discussion of a language demand, providing pictures to illustrate vocabulary.
- The candidate may inaccurately categorize a language demand (e.g., identifies syntax as discourse), but does describe general supports for two of the language demands required of students within the learning task. For example:
  - "For discourse, I will model how to identify and substitute terms into the formula  $a=mg$ . To support vocabulary, we will review the terms (acceleration, mass, gravity) and solve several sample problems as a class." This example would be scored at a Level 3 because there are supports for two language demands, vocabulary and syntax, even though the candidate categorizes using formulas (a form of syntax) as discourse.

## Below 3

### **Evidence that demonstrates performance below 3:**

- The candidate has a superficial view of academic language and provides supports that are misaligned with the demands or provides support for only one language demand (vocabulary and/or symbols, function, syntax, discourse, or visual representation).

### **What distinguishes a Level 2 from a Level 3:** At Level 2,

- The primary focus of support is on only one of the language demands (vocabulary and/or symbols, function, syntax, discourse, or visual representation) with little to no attention to any of the other language demands.
- Support may be general (e.g., discussing, defining or describing a language demand), or it may be targeted, (e.g., modeling a language demand while using an example with labels). Regardless, the support provided is limited to one language demand.

### **What distinguishes a Level 1 from a Level 2:** At Level 1,

- There is a pattern of misalignment between the language demand(s), and the language supports identified. For example, the language function is listed as analyzing, but the language task is that the students will be expected to put the unit's key terms in their engineering notebooks. A list of key vocabulary terms is included. "AND, OR, and NOT gates and their symbols will be used as part of the discourse that will occur as the students work on their projects." This example would be scored at a Level 3 because there are supports for two language demands, vocabulary and discourse, even though the candidate miscategorizes gates and their symbols as discourse.

OR

- Language supports are completely missing.

## Above 3

### **Evidence that demonstrates performance above 3:**

- The supports specifically address the language function, vocabulary, and/or symbols, and at least one other language demand (syntax, discourse, and/or visual representation) in relation to the use of the language function in the context of the chosen task.

### **What distinguishes a Level 4 from a Level 3:** At Level 4,

- The candidate identifies specific planned language supports in relation to vocabulary/symbols, the language function, and describes how supports address each of the following: (syntax, discourse, and/or visual representation).
- Supports are focused (e.g., provide structures or scaffolding) to address specific language demands, such as sentence starters (syntax or function); modeling how to construct an argument, explanation, or paragraph using a think aloud (function, discourse); graphic organizers tailored to organizing text (discourse or function); identifying critical elements of a language function using an example; or more in-depth exploration of vocabulary development (vocabulary mapping that includes antonym, synonym, student definition and illustration).

**What distinguishes a Level 5 from a Level 4:** At Level 5, the candidate meets all of Level 4 **AND**

- The candidate includes and explains how one or more of the language supports are either designed or differentiated to meet the needs of students with differing language needs.

## Planning Rubric 5: Planning Assessments to Monitor and Support Student Learning

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**TED5: How are the formal and informal assessments selected or designed to monitor students' technology-related conceptual understanding, technical skills, and engineering design or other problem-solving strategies?**

### The Guiding Question

The Guiding Question addresses the alignment of the assessments to the standards and objectives and the extent to which assessments provide multiple forms of evidence to monitor student progress throughout the learning segment. It also addresses required adaptations from IEPs or 504 plans. The array of assessments should provide evidence of students' technology-related conceptual understanding, technical skills, and engineering design or other problem-solving strategies.

### Key Concepts of Rubric:

- **assessment (formal and informal)**—"[R]efer[s] to all those activities undertaken by teachers and by their students . . . that provide information to be used as feedback to modify teaching and learning activities."<sup>5</sup> Assessments provide evidence of students' prior academic 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 or perform. Formal assessments may include such things as quizzes, homework assignments, journals, projects and performance tasks.
- **engineering design process/technological design process**—At its infancy, the process includes identifying a problem, looking for ideas, developing solutions, and sharing the solution with others. Although there is no "right" process, common items in this iterative approach are: (a) Identifying the problem; (b) Defining the working criteria/goals; (c) Researching and gathering data; (d) Brainstorming/generating creative ideas; (e) Analyzing potential solutions; (f) Developing and testing models; (g) Making the decision; (h) Communicating and specifying; (i) Implementing and commercializing; and (j) Performing post-implementation review and assessment. It is important in any design process, however, that students perform the necessary analysis, mathematical and scientific predictions, and optimization needed to solve the problem.<sup>6</sup>

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<sup>5</sup> Black, P., & Wiliam, D. (1998). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan*, 80(2), 139–148.

<sup>6</sup> International Technology Education Association. (2007). *Standards for technological literacy: Content for the study of technology*. Reston, VA: Author. Retrieved from <http://www.iteea.org/10/39197.aspx>

### Primary Sources of Evidence:

Context for Learning Information (required supports, modifications, or accommodations for assessments)

Planning Commentary **Prompt 5**

Assessment Materials

Strategic review of Lesson Plans

## Scoring Decision Rules

▶ <b>Multiple Criteria</b>	■ N/A for this rubric
▶ <b>AUTOMATIC 1</b>	■ None of the assessment-related adaptations required by IEPs or 504 plans are made. (If there are no students with IEPs or 504 plans, then this criterion is not applicable.)

## Unpacking Rubric Levels

### Level 3

#### Evidence that demonstrates performance at Level 3:

- The planned assessments provide evidence of students' technology-related conceptual understanding, technical skills, AND engineering design or other problem-solving strategies at various points within the learning segment. The assessments must provide evidence of all three (technology-related conceptual understanding, technical skills, AND engineering design or other problem-solving strategies.)
- Requirements from the IEP or 504 plan must be explicitly addressed in the commentary and/or the Planning Task 1 artifacts. List of requirements and/or accommodations in the Context for Learning Information document is not sufficient by itself.

### Below 3

#### Evidence that demonstrates performance below 3:

- The planned assessments will yield insufficient evidence to monitor students' technology-related conceptual understanding, technical skills, OR engineering design or other problem-solving strategies within the learning segment.

#### What distinguishes a Level 2 from a Level 3: At Level 2,

- Assessments will produce evidence of student learning, but evidence is limited. Examples of limited assessments include a single assessment or assessments for only technical skills or technology-related conceptual understanding and not the other areas.
- Although assessments may provide some evidence of student learning, they do not collectively monitor all areas of learning across the learning segment.

#### What distinguishes a Level 1 from a Level 2: At Level 1,

- The assessments only focus on following rote procedures for applying technical skills without providing evidence of technology-related conceptual understanding OR engineering design principles or other problem-solving strategies.

### **Automatic Score of 1:**

- If there is NO attention to ANY assessment-related IEP/504 plan requirements (e.g., more time; a scribe for written assignments) in either the commentary or the Planning Task 1 artifacts, the score of 1 is applied; otherwise the evidence for the other criteria will determine the score. **(If there are no students with IEPs or 504 plans, then this criterion is not applicable.)**

### **Above 3**

#### **Evidence that demonstrates performance above 3:**

- The array of assessments provides consistent evidence of technology-related conceptual understanding, technical skills, AND engineering design or other problem-solving strategies.
- Assessment evidence will allow the candidate to determine students' progress toward developing technology-related conceptual understanding, technical skills, AND engineering design and/or other problem-solving strategies.

#### **What distinguishes a Level 4 from a Level 3:** At Level 4,

- There are multiple forms of evidence, not just the same kind of evidence collected at different points in time or in different settings, to monitor student development of technology-related conceptual understanding, technical skills, AND engineering design or other problem-solving strategies for the central focus. "Multiple forms of evidence" means that different types of evidence are used—e.g., description, explanation, graphical representations, problem steps, generalization to another context, work artifacts—and not that there is only one type of evidence on homework, exit slips, and the final test.
- The array of assessments provides evidence to track student progress toward developing the technology-related conceptual understanding, technical skills, **AND** engineering design or other problem-solving strategies defined by the standards and learning objectives.

#### **What distinguishes a Level 5 from a Level 4:** At Level 5, the candidate meets Level 4 **AND**

- Describes how assessments are targeted and explicit in design to allow individuals or groups with specific needs to demonstrate their learning without oversimplifying the content.
- Strategic design of assessments goes beyond, for example, allowing extra time to complete an assignment or adding a challenge question.

## Instruction Rubric 6: Learning Environment

**TED6: How does the candidate demonstrate a safe, positive learning environment that supports students' engagement in learning?**

### The Guiding Question

The Guiding Question addresses the type of learning environment that the candidate establishes and the degree to which it fosters respectful interactions between the candidate and students, and among students.

### Key Concepts of Rubric:

- *Respect*—A positive feeling of esteem or deference for a person and specific actions and conduct representative of that esteem. Respect can be a specific feeling of regard for the actual qualities of the one respected. It can also be conduct in accord with a specific ethic of respect. Rude conduct is usually considered to indicate a lack of respect, **disrespect**, whereas actions that honor somebody or something indicate respect. Note that respectful actions and conduct are culturally defined and may be context dependent. **Scorers are cautioned to avoid bias related to their own culturally constructed meanings of respect.**
- *Rapport*—A close and harmonious relationship in which the people or groups understand each other's feelings or ideas and communicate well.

For the following term from the rubric, see the handbook glossary:

- *Learning environment*
- *Safety*

### Primary Sources of Evidence:

Video Clips

Instruction Commentary **Prompt 2**

Note that for the Instruction Task, the commentary is intended to provide context for interpreting what is shown in the video. Candidates sometimes describe events that do not appear in the video or conflict with scenes from the video—**such statements should not override evidence depicted in the video.**

### Scoring Decision Rules

- |                            |  |
|----------------------------|--|
| ▶ <b>Multiple Criteria</b> | ▪ N/A  |
| ▶ <b>AUTOMATIC 1</b>       | ▪ There are unaddressed safety issues seen in the video that pose a danger to students, or there is evidence in the video that students do not understand safety procedures. |

## Unpacking Rubric Levels

### Level 3

**Evidence that demonstrates performance at Level 3:** In the clips:

- The candidate's interactions with students are respectful, demonstrate rapport (evidence of relationship between candidate and students and/or ease of interaction that goes back and forth based on relevance or engaged conversation), and students communicate easily with the candidate.
- There is evidence that the candidate facilitates a positive learning environment wherein students are willing to answer questions and work together without the candidate or other students criticizing their responses.
- There is evidence of mutual respect among students. Examples include attentive listening while other students speak, respectful attention to another student's idea (even if disagreeing), working together with a partner or group to accomplish tasks.

### Below 3

**Evidence that demonstrates performance below 3:** The clips:

- Do not exhibit evidence of positive relationships and interactions between candidate and students.
- Reveal a focus on classroom management and maintaining student behavior and routines rather than engaging students in learning.

**What distinguishes a Level 2 from a Level 3:** At Level 2,

- Although clips reveal the candidate's respectful interactions with students, there is an emphasis on candidate's rigid control of student behaviors, discussions, and other activities in ways that limit and do not support learning.

**What distinguishes a Level 1 from a Level 2:** At Level 1, there are **two different ways** that evidence is scored:

1. The clips reveal evidence of candidate-student or student-student interactions that discourage student contributions, disparage the student(s), or take away from learning.
2. The classroom management is so weak that the candidate is not able to, or does not successfully, redirect students, or the students themselves find it difficult to engage in learning tasks because of disruptive behavior.

*Note: Classroom management styles vary. Video clips that show classroom environments where students are productively engaged in the learning task should not be labeled as disruptive. Examples of this may include students engaging in discussion with peers, speaking without raising their hands, or being out of their seats.*

**Automatic Score of 1 is given when:**

- There are unaddressed safety issues seen in the video that pose a danger to students or there is evidence in the video that students do not understand safety procedures.

### Above 3

**Evidence that demonstrates performance above 3:**

- The clip(s) reveal a positive learning environment that includes tasks/discussions that challenge student thinking and encourage respectful student-student interaction.

**What distinguishes a Level 4 from a Level 3:** At Level 4,

- The learning environment supports learning tasks that appropriately challenge students by promoting higher-order thinking or application to develop new learning. There must be evidence that the environment is challenging for students. Examples include: students cannot answer immediately, but need to think to respond; the candidate asks higher-order thinking questions; students are trying to apply their initial learning to another context.
- The learning environment encourages and supports mutual respect among students

**What distinguishes a Level 5 from a Level 4:** At Level 5,

- The learning environment encourages students to express, debate, and evaluate differing perspectives about content with each other. Perspectives could be from curricular sources, students' ideas, and/or lived experiences.

## Instruction Rubric 7: Engaging Students in Learning

**TED7: How does the candidate actively engage students in developing technology-related conceptual understanding, technical skills, and engineering design or other problem-solving process strategies?**

### The Guiding Question

The Guiding Question addresses how the candidate provides video evidence of engaging students in meaningful tasks and discussions to develop their understanding of technology-related concepts, technical skills, AND engineering design or other problem-solving strategies.

### Key Concepts of Rubric:

For the following terms from the rubric, see the handbook glossary:

- *Assets* (personal, cultural, community)
- *Engaging students in learning*
- *Engineering design process/technological design process*

### Primary Sources of Evidence:

Video Clips

Instruction Commentary **Prompt 3**

Note that for the Instruction Task, the commentary is intended to provide context for interpreting what is shown in the video. Candidates sometimes describe events that do not appear in the video or conflict with scenes from the video—**such statements should not override evidence depicted in the video.**

### Scoring Decision Rules

▶ <b>Multiple Criteria</b>	<ul style="list-style-type: none"><li>▪ Criterion 1 (<b>primary</b>): Engagement in learning tasks</li><li>▪ Criterion 2: Connections between students' academic learning <b>AND/OR</b> assets (personal, cultural, community) and new learning</li><li>▪ Place greater weight or consideration on the criterion 1 (engagement in learning tasks).</li></ul>
▶ <b>AUTOMATIC 1</b>	<ul style="list-style-type: none"><li>▪ None</li></ul>

## Unpacking Rubric Levels

### Level 3

#### Evidence that demonstrates performance at Level 3:

- *Primary Criterion:* The clips show that the students are engaged in learning tasks that provide opportunities for students to focus on technology-related conceptual understanding, technical skills, **AND** engineering design or other problem-solving strategies. Although these content understandings are evident in conversations, they are addressed at a cursory level. For example, the candidate has a student summarize how to turn a 3D object into an orthographic view. The candidate relates this to 2D layouts, but moves on immediately without allowing the students to demonstrate their knowledge and understanding of the technology-related conceptual understanding, technical skills, **AND** engineering design or other problem-solving process strategies leaving the instruction at a cursory level.
- *Secondary Criterion:* The clips show the candidate **making connections** to students' prior academic learning to help them develop the new content or skills.

### Below 3

#### Evidence that demonstrates performance below 3:

- Students are participating in tasks that provide little opportunity to develop technology-related conceptual understanding, technical skills, **AND** engineering design or other problem-solving strategies. For example, the candidate does most of the instruction via lecture. Students are not actively engaged in the development of the technology-related conceptual understanding, technical skills, **AND** engineering design or other problem-solving process strategies.

#### What distinguishes a Level 2 from a Level 3: At Level 2,

- Students are participating in tasks that primarily focus on applying technical skills in a rote manner and provide little opportunity to develop technology-related conceptual understanding **OR** engineering design or other problem-solving strategies.
- The structure of the learning task or the way in which it is implemented constrains student development of content and skills.
- In addition, the candidate may refer to students' learning from prior units, but the references are indirect or unclear and do not facilitate new learning.

#### What distinguishes a Level 1 from a Level 2: At Level 1,

- The learning tasks seen in the video clips have little relation to the central focus identified.
- In addition, the candidate is not using either students' prior academic learning or assets (personal, cultural, community) to build new learning.

### Above 3

#### Evidence that demonstrates performance above 3:

- The learning tasks, as seen in the clips, are structured to engage students to develop understandings of technology-related concepts and technical skills through applying engineering design principles or other problem-solving strategies.
- Connections between students' prior academic learning and assets (personal, cultural, community) are made to support the new learning.

**What distinguishes a Level 4 from a Level 3:** At Level 4,

- The learning tasks in the clips include structures or scaffolding that promote the learning of technology-related concepts, technical skills AND engineering design or other problem-solving strategies. Students must interact with the content in ways that are likely to either extend initial understandings or surface misunderstandings that the candidate can then address.
- In addition, the candidate draws upon not only prior academic learning, but also students' assets (personal, cultural, community) to develop new learning.

**What distinguishes a Level 5 from a Level 4:** At Level 5,

- The learning tasks as seen in the clips are structured or scaffolded so that students will develop and use technology-related concepts, technical skills AND engineering design or other problem-solving strategies in ways that are appropriately challenging and directly related to new learning.
- In addition, the candidate encourages students to connect and use their prior academic knowledge and assets (academic **AND** personal, cultural, community) to support new learning.

## Instruction Rubric 8: Deepening Student Learning

**TED8: How does the candidate elicit responses to promote thinking and develop technology-related conceptual understanding, technical skills, and engineering design or other problem-solving strategies?**

### The Guiding Question

The Guiding Question addresses how the candidate brings forth and builds on student responses to guide learning in the video clips; this can occur during whole class discussions, small group discussions, or consultations with individual students.

### Key Concepts of Rubric:

- *Significant content inaccuracies*—Content flaws within processes or examples used during the lesson will lead to student misunderstandings and the need for reteaching.

#### Primary Sources of Evidence:

Video Clips

Instruction Commentary **Prompt 4a**

Note that for the Instruction Task, the commentary is intended to provide context for interpreting what is shown in the video. Candidates sometimes describe events that do not appear in the video or conflict with scenes from the video—**such statements should not override evidence depicted in the video.**

### Scoring Decision Rules

▶ <b>Multiple Criteria</b>	▪ N/A for this rubric
▶ <b>AUTOMATIC 1</b>	▪ Pattern of <b>significant content inaccuracies</b> that are core to the central focus or a key learning objective for the learning segment

### Unpacking Rubric Levels

#### Level 3

##### Evidence that demonstrates performance at Level 3:

- The candidate prompts students to offer responses that require thinking related to technology-related concepts, technical skills, OR engineering design or other problem-solving strategies, e.g., by using "how" and "why" questions. Some instruction may be characterized by initial questions focusing on facts to lay a basis for later higher-order questions in the clip.

#### Below 3

##### Evidence that demonstrates performance below 3:

- In the clips, classroom interactions provide students with limited or no opportunities to think and learn.
- Little interaction between the candidate and the students is shown.

**What distinguishes a Level 2 from a Level 3:** At Level 2,

- The candidate asks questions that elicit right/wrong or yes/no answers and do little to encourage students to think about the content being taught.

**What distinguishes a Level 1 from a Level 2:** At Level 1,

- There are few opportunities shown in the clips that students were able to express ideas.

**Automatic Score of 1 is given when:**

- There is a pattern of **significant content inaccuracies** that will lead to student misunderstandings.
- The candidate makes a significant error in content (e.g., introducing an inaccurate definition of a central concept before students work independently) that is core to the central focus or a key standard for the learning segment.

**Above 3**

**Evidence that demonstrates performance above 3:**

- In the clips, the candidate uses student ideas and thinking to develop students' learning about technology and engineering or their abilities to evaluate their own learning.

**What distinguishes a Level 4 from a Level 3:** At Level 4,

- The candidate follows up on student responses to encourage the student or his/her peers to explore or build on the ideas expressed.
- The candidate uses this strategy to develop students' understanding of technology-related concepts, technical skills, AND engineering design or other problem-solving strategies.
- Examples of "building on student responses" include referring to a previous student response in developing a point or considering design ideas; calling on a student to elaborate on what s/he said; posing questions to guide a student discussion; soliciting student examples and asking another student to identify what several examples have in common; asking a student to describe the criteria for a design or problem; and asking another student to respond to a student comment or answer a question posed by a student to move instruction forward.

**What distinguishes a Level 5 from a Level 4:** At Level 5, the candidate meets all of Level 4 **AND**

- There is evidence in the clips that the candidate structures and supports student-student conversations and interactions that facilitate students' ability to evaluate and self-monitor their learning.

## Instruction Rubric 9: Subject-Specific Pedagogy: The Work Artifact(s)

**TED9: How does the candidate guide student production and/or use of work artifact(s) to support the engineering design and/or problem-solving process?**

### The Guiding Question

The Guiding Question addresses how the candidate uses work artifact(s) (e.g., sketches, charts, graphic representations, models, prototypes, projects, products) in the video clips to build students' understanding and use of **the engineering design and/or problem-solving process**.

### Key Concepts of Rubric:

- *Engineering design process/technological design process*—At its infancy, the process includes identifying a problem, looking for ideas, developing solutions, and sharing the solution with others. Although there is no "right" process, common items in this iterative approach are: (a) Identifying the problem; (b) Defining the working criteria/goals; (c) Researching and gathering data; (d) Brainstorming/generating creative ideas; (e) Analyzing potential solutions; (f) Developing and testing models; (g) Making the decision; (h) Communicating and specifying; (i) Implementing and commercializing; and (j) Performing post-implementation review and assessment. It is important in any design process, however, that students perform the necessary analysis, mathematical and scientific predictions, and optimization needed to solve the problem.<sup>7</sup>
- *Work artifact*—Sometimes thought of as a project that students would complete as part of a lesson or unit of instruction, an artifact is considered the physical evidence and/or visual representation that students submit to their teacher that would allow the teacher to properly assess student knowledge and skill. Artifacts in technology and engineering education could be in many forms. Examples of artifacts could include, but are not limited to, CAD models and drawings, portfolios, written work, engineering design notebooks, prototypes, or other physical components that are common to technology and engineering education content.

#### Primary Sources of Evidence:

Video Clips

Instruction Commentary **Prompt 4b**

Note that for the Instruction Task, the commentary is intended to provide context for interpreting what is shown in the video. Candidates sometimes describe events that do not appear in the video or conflict with scenes from the video—**such statements should not override evidence depicted in the video**.

<sup>7</sup> International Technology Education Association. (2007). *Standards for technological literacy: Content for the study of technology*. Reston, VA: Author. Retrieved from <https://www.iteea.org/File.aspx?id=67767&v=b26b7852>

## Scoring Decision Rules

▶ <b>Multiple Criteria</b>	■ N/A for this rubric
▶ <b>AUTOMATIC 1</b>	■ Materials used in the clips include <b>significant content inaccuracies</b> that will lead to student misunderstandings.

## Unpacking Rubric Levels

### Level 3

#### **Evidence that demonstrates performance at Level 3:**

- In the clips, the candidate guides conversation and/or structures explorations enabling students to use or produce work artifacts in ways that help students understand and use the engineering design and/or problem-solving process.

### Below 3

#### **Evidence that demonstrates performance below 3:**

- In the clips, the candidate is not guiding student learning to prepare or allow them to effectively use or produce work artifacts.

#### **What distinguishes a Level 2 from a Level 3:** At Level 2,

- The candidate attempts to relate understanding of the use or production of a work artifact to the engineering design and/or problem-solving process, but the connections between them are not strong enough or clear enough to be effective.

#### **What distinguishes a Level 1 from a Level 2:** At Level 1,

- The candidate makes no connections between any work artifact and the engineering design and/or problem-solving process.

#### **Automatic Score of 1 is given when:**

- Materials used in the clips contain a significant content error that will lead to student misunderstandings. "Significant" means core to the central focus or a key standard in the learning segment.

### Above 3

#### **Evidence that demonstrates performance above 3:**

- In the clips, the candidate guides the students' production and use of one or more work artifacts to develop students' understanding and use of the engineering design and/or problem-solving process.

#### **What distinguishes a Level 4 from a Level 3:** At Level 4,

- In the clips, the candidate poses carefully chosen problems or and/or strategic structuring of explorations towards the production and use of one or more work artifacts to encourage students to think more deeply about the engineering design and/or problem-solving process.

**What distinguishes a Level 5 from a Level 4:** At Level 5, in the clips, the candidate meets Level 4 **AND**

- Structures and supports student production and/or explorations in ways that help students extend their own understanding and use of the engineering design and/or problem-solving process.

# Instruction Rubric 10: Analyzing Teaching Effectiveness

**TED10: How does the candidate use evidence to evaluate and change teaching practice to meet students' varied learning needs?**

## The Guiding Question

The Guiding Question addresses how the candidate examines the teaching and learning in the video clips and proposes what s/he could have done differently to better support the needs of diverse students. The candidate justifies the changes based on student needs and references to research and/or theory.

## Key Concepts of Rubric:

- N/A

### Primary Sources of Evidence:

Instruction Commentary **Prompt 5**

Video Clips (for evidence of student learning)

## Scoring Decision Rules

▶ <b>Multiple Criteria</b>	<ul style="list-style-type: none"><li>▪ Criterion 1 (<b>primary</b>): Proposed changes</li><li>▪ Criterion 2: Connections to research/theory</li><li>▪ Place greater weight or consideration on criterion 1 (proposed changes).</li></ul>
▶ <b>AUTOMATIC 1</b>	<ul style="list-style-type: none"><li>▪ None</li></ul>

## Unpacking Rubric Levels

### Level 3

#### Evidence that demonstrates performance at Level 3:

- *Primary criterion:* The proposed changes address the central focus and the candidate explicitly connects those changes to the learning needs of the class as a whole.
  - Proposed changes noted by the candidate should be related to the lessons that were seen or referenced in the clips, but do not need to be exclusively from what was seen in the clips alone. This means that since only portions of the lessons will be captured by the clips, candidates can suggest changes to any part of the lesson(s) referenced in the clips, even if those portions of the lesson(s) are not depicted in the clips.
- *Secondary criterion:* The candidate refers to research or theory in relation to the plans to support student learning. The connections between the research/theory and the tasks are vague/not clearly made.
- If evidence meets the primary criterion at Level 3, the rubric is scored at Level 3 **regardless of the evidence for the secondary criterion.**
- If evidence meets the primary criterion at Level 4 and candidate has NO connection to research/theory, the rubric is scored at Level 3.

### Below 3

#### **Evidence that demonstrates performance below 3:**

- The changes proposed by the candidate are not directly related to student learning.

#### **What distinguishes a Level 2 from a Level 3:** At Level 2,

- The changes address improvements in teaching practice that mainly focus on how the candidate structures or organizes learning tasks, with a superficial connection to student learning. There is little detail on the changes in relation to either the central focus or the specific learning that is the focus of the video clips. Examples include but are not limited to asking additional higher-order questions without providing examples, improving directions, repeating instruction without making significant changes based on the evidence of student learning from the video clips, or including more group work without indicating how the group work will address specific learning needs.
- If a candidate's proposed changes have nothing to do with the central focus, this rubric cannot be scored beyond a Level 2.

#### **What distinguishes a Level 1 from a Level 2:** At Level 1,

- The proposed changes are not supported by evidence of student learning from lessons seen or referenced in the clips.

### Above 3

#### **Evidence that demonstrates performance above 3:**

- The proposed changes relate to the central focus and explicitly address individual and collective needs that were within the lessons seen in the video clips.
- The changes in teaching practice are supported by research and/or theory.

#### **What distinguishes a Level 4 from a Level 3:** At Level 4,

- The changes clearly address the learning needs of individuals in addition to the learning needs of the whole class in the video clips by providing additional support and/or further challenge in relation to the central focus. Candidate should explain how proposed changes relate to each individual's needs.
- The candidate explains how research or theory is related to the changes proposed. Candidates may cite research or theory in their commentary, or refer to the ideas and principles from the research; either connection is acceptable, as long as they clearly connect the research/theory to the proposed changes.
- Scoring decision rules: To score at Level 4, the candidate must meet the primary criterion at Level 4 and make at least a fleeting, relevant reference to research or theory (meet the secondary criterion at least at Level 3).

#### **What distinguishes a Level 5 from a Level 4:** At Level 5, the candidate meets Level 4 **AND**

- Explains how principles of research or theory **support or frame the proposed changes**. The justifications are explicit, well-articulated, and demonstrate a thorough understanding of the research/theory principles that are clearly reflected in the explanation of the changes.

# Assessment Rubric 11: Analysis of Student Learning

**TED11: How does the candidate analyze evidence of student learning related to conceptual understanding, technical skills, and engineering design or other problem-solving strategies?**

## The Guiding Question

The Guiding Question addresses the candidate's analysis of student work to identify patterns of learning across the class.

## Key Concepts of Rubric:

- *Aligned*—The assessment, evaluation criteria, learning objectives and analysis are clearly connected with each other.
- *Evaluation criteria*—Evaluation criteria should indicate differences in level of performance, e.g., a rubric, a checklist of desired attributes, points assigned to different parts of the assessment. Summative grades are not evaluation criteria. Evaluation criteria must be relevant to the learning objectives, though they may also include attention to other desired features of the assessment response, e.g., neatness, spelling.

For the following term from the rubric, see the handbook glossary:

- *Patterns of learning*

### Primary Sources of Evidence:

Assessment Commentary **Prompt 1**

Student work samples

Evaluation criteria

## Scoring Decision Rules

▶ <b>Multiple Criteria</b>	▪ N/A for this rubric
▶ <b>AUTOMATIC 1</b>	▪ Significant misalignment between evaluation criteria, learning objectives, and/or analysis

## Unpacking Rubric Levels

### Level 3

#### Evidence that demonstrates performance at Level 3:

- The analysis is an accurate listing of what students did correctly and incorrectly.
- The analysis is aligned with the evaluation criteria and/or assessed learning objectives.
- Some general differences in learning across the class are identified.

## Below 3

### **Evidence that demonstrates performance below 3:**

- The analysis is superficial (e.g., primarily irrelevant global statements) or focuses only on partial data (on right or wrong answers or only on following rote procedures for applying technical skills or engineering design or other problem-solving strategies with no understanding of the content or situation).
- The analysis is contradicted by the work sample evidence or the summary.
- The analysis is based on an inconsistent alignment with evaluation criteria and/or standards/objectives.

### **What distinguishes a Level 2 from a Level 3:** At Level 2:

- Although aligned with the summary, the analysis presents an incomplete picture of student learning by only addressing either successes or errors.

### **What distinguishes a Level 1 from a Level 2:** There are **two different ways** that evidence is scored at Level 1:

1. The analysis is superficial because it ignores important evidence from the work samples, focusing on trivial aspects.
2. The conclusions in the analysis are not supported by the work samples or the summary of learning.

### **Automatic Score of 1 is given when:**

- There is a significant lack of alignment between evaluation criteria, learning objectives, and/or analysis. A lack of alignment can be caused by a lack of relevant evaluation criteria to assess student performance on the learning objectives.

## Above 3

### **Evidence that demonstrates performance above 3:** The analysis:

- Identifies patterns of learning (quantitative and qualitative) that summarize what students know, are able to do, and still need to learn.
- Describes patterns for the whole class, groups, or individuals.
- Is supported with evidence from the work samples and is consistent with the summary.

### **What distinguishes a Level 4 from a Level 3:** At Level 4,

- The analysis describes consistencies in performance (patterns) across the class in terms of what students know and are able to do and where they need to improve.
- The analysis goes beyond a listing of students' successes and errors, to an explanation of student understanding in relation to their performance on the identified assessment. An exhaustive list of what students did right and wrong, or the % of students with correct or incorrect responses, should be scored at Level 3, as that does not constitute a pattern of student learning. A pattern of student learning goes beyond these quantitative differences to identify specific content understandings or misunderstandings, or partial understandings that are contributing to the quantitative differences.

- Specific examples from work samples are used to demonstrate the whole class patterns. An example is "Most students were successful turning a 3D object into an orthographic design but far fewer were successful with 2D layouts. Student A was able to label the layout of the package and successfully identify the different sides in their drawing. However, most students were like Student B, who could only identify the sides in their drawing once they physically saw the different sides of the package. Only then were they able to understand and problem solve what sides went where on the layout."

**What distinguishes a Level 5 from a Level 4:** At Level 5,

- The candidate uses specific evidence from work samples to demonstrate qualitative patterns of understanding. The analysis uses these qualitative patterns to interpret the range of similar correct or incorrect responses from individuals or groups (e.g., quantitative patterns), and to determine elements of what students learned and what would be most productive to work on. The qualitative patterns may include struggles, partial understandings, and/or attempts at solutions. An example would be "Most students were successful turning a 3D object into an orthographic design as illustrated by Student A. But most students were like Student B, who could only identify the sides in their drawing once they physically saw the different sides of the package, while Student A could identify the sides correctly without physically seeing the different sides of the package. Student A was able to visualize and problem solve without seeing the physical package first. This suggests that most of my students understood the procedures, but most had difficulty with the conceptual understanding sufficient to recognize which sides went where on the layout in an abstract manner. Many appeared to be confused, because like Student B, there was no consistent error across the layout of the package when asked to identify the sides in a 2D drawing. The drawings were correct, but the labeling was not accurate."

# Assessment Rubric 12: Providing Feedback to Guide Learning

**TED12: What type of feedback does the candidate provide to focus students?**

## The Guiding Question

The Guiding Question addresses the evidence of feedback provided to the focus students. Feedback may be written on the three student work samples or provided in a video/audio format. The feedback should identify what students are doing well and what needs to improve in relation to the learning objectives.

## Key Concepts of Rubric:

- *Significant content inaccuracies*—Content flaws in the feedback are significant and systematic, and interfere with student learning
- *Developmentally inappropriate feedback*—Feedback addressing concepts, skills, or procedures well above or below the content assessed (without clearly identified need) OR feedback that is not appropriate for the developmental level of the student (e.g., lengthy written explanations for English learners or feedback to a student with an explanation that references a concept later in the curriculum).

### Primary Sources of Evidence:

Assessment Commentary **Prompt 2a–b**

Evidence of feedback (written, audio/video)

## Scoring Decision Rules

▶ <b>Multiple Criteria</b>	▪ N/A
▶ <b>AUTOMATIC 1</b>	▪ One or more content errors in the feedback that will mislead student(s) in significant ways ▪ No evidence of feedback for one or more focus students
▶ <b>Preponderance of Evidence</b>	▪ You must apply the preponderance of evidence rule when the focus students receive varying types of feedback. For example, when the candidate provides feedback on both strengths and needs for 2 out of the 3 focus students, this example would be scored at a Level 4 according to the preponderance of evidence rule.

## Unpacking Rubric Levels

### Level 3

#### Evidence that demonstrates performance at Level 3:

- The feedback identifies **specific** strengths OR needs for improvement. At Level 3, the candidate MUST provide the focus students with qualitative feedback about their performance that is aligned with the learning objectives. Specific feedback includes such things as successfully applying the conceptual knowledge, identifying and naming proper isometric or perspective views, pointing to and naming errors, and suggesting information that would help improve the individual strengths and weaknesses relative to the learning targets. Checkmarks, points deducted, grades, or scores do not meet the Level 3, even when they distinguish errors from correct responses.

### Below 3

#### Evidence that demonstrates performance below 3:

- Evidence of feedback is general, unrelated to the assessed learning objectives, developmentally inappropriate, inaccurate, or missing for one or more focus students.

#### What distinguishes a Level 2 from a Level 3: At Level 2,

- Although the feedback is related to the assessed learning objectives, it is also vague and does not identify specific strengths or needs for improvement. At Level 2, general feedback includes identifying what each focus student did or did not do successfully with little detail, e.g., checkmarks for correct responses, points deducted, and comments such as, "Make sure to erase completely!" that are not linked to a specific strength or need. General feedback does not address the specific error or correct solution (e.g., "Check your work" or "Yes!"). Feedback that is limited to a single remark, such as identifying the total percent correct (86%), an overall letter grade (B), or one comment such as "Nice work!" with no other accompanying comments or grading details does not meet the Level 2 requirement and should be scored at a Level 1. Those examples of a single piece of feedback do not even provide any general feedback to focus students that is related to the learning objectives.

#### What distinguishes a Level 1 from a Level 2: There are **two different ways** that evidence is scored at Level 1:

1. Feedback is not related to the learning objectives.
2. Feedback is not developmentally appropriate.

#### Automatic Score of 1 is given when:

- Feedback includes content inaccuracies that will misdirect the focus student(s).
- There is no evidence of feedback for the analyzed assessment for one or more focus students. This includes when there is only a description of feedback rather than actual feedback (video, audio or written) presented to the focus student(s).

### Above 3

#### Evidence that demonstrates performance above 3:

- Feedback is specific, related to assessed learning objectives, and addresses students' strengths AND needs.

**What distinguishes a Level 4 from a Level 3:** At Level 4,

- Specific feedback addresses both strengths and needs. For example, "You did a great job identifying and naming proper isometric or perspective views. Make sure to erase completely next time."

**What distinguishes a Level 5 from a Level 4:** At Level 5, the candidate meets Level 4  
**AND**

- The feedback for at least one focus student includes:
  - A strategy to address a specific learning need, including the need for a greater challenge. For example, "You correctly identified the perspective views. Make sure to take your time with the drawings and show all the views."

**OR**

- A meaningful connection to experience or prior learning. For example, the candidate refers back to a prior math lesson: "I want you to visualize the drawing you did last week of a 2D object. This time you are going to sketch and label all of the sides of the same object from a 3D view."

# Assessment Rubric 13: Student Understanding and Use of Feedback

**TED13: How does the candidate support focus students to understand and use the feedback to guide their further learning?**

## The Guiding Question

The Guiding Question addresses how the candidate explains how they will help focus students understand and use the feedback provided in order to improve their learning.

## Key Concepts of Rubric:

- N/A

### Primary Sources of Evidence:

Assessment Commentary **Prompt 2c**

Evidence of Written or Oral Feedback

## Scoring Decision Rules

▶ <b>Multiple Criteria</b>	▪ N/A for this rubric
▶ <b>AUTOMATIC 1</b>	▪ None

## Unpacking Rubric Levels

### Level 3

#### Evidence that demonstrates performance at **Level 3**:

- Candidate describes how the focus students will understand **OR** use feedback related to the learning objectives. This description needs to relate to the feedback given to one or more of the focus students.
- The description should be specific enough that you understand what the candidate and/or students are going to do in relation to the feedback given. Otherwise, it is vague and the evidence should be scored at Level 2.
  - Example for **understanding** feedback: Candidate reviews work with whole class focusing on common mistakes that explicitly includes content that one or more focus students were given feedback on.
  - Example for **using** feedback: Candidate asks focus students to revise work using feedback given and resubmit revised work.

### Below 3

#### Evidence that demonstrates performance **below 3**:

- Opportunities for understanding or using feedback are superficially described or absent.

**What distinguishes a Level 2 from a Level 3:** At Level 2,

- The description of how the focus students will understand or use feedback is very general or superficial. Details about **how** the students will understand or use the feedback are missing (e.g., "The students will use the feedback on their next assignment").
- The use of feedback is not clearly related to the assessed learning objectives.

**What distinguishes a Level 1 from a Level 2:** At Level 1,

- Opportunities for understanding or using feedback are not described **OR**
- There is **NO** evidence of feedback for two or more focus students.

**Above 3**

**Evidence that demonstrates performance above 3:**

- Support for the focus students to understand **AND** use feedback is described in enough detail to understand how students will develop in areas identified for growth and/or continue to deepen areas of strength.

**What distinguishes a Level 4 from a Level 3:** At Level 4,

- The candidate describes planned or implemented support for the focus students to understand and use feedback on their strengths **OR** weaknesses to further develop their learning in relation to learning objectives. For example, a candidate may work with focus students in a small group and reteach several concepts they struggled with on their assessment (as noted by feedback given), using a graphic organizer to further develop understanding of each concept (such as a T-chart or concept map). Next, students would be given an opportunity to revise their responses involving those concepts, using the graphic organizer to support their revisions. This example shows how a candidate can help focus students understand their feedback in relation to misunderstandings and support them in using that feedback to enhance learning in relation to objectives assessed. This type of planned support could take place with the whole class as long as explicit attention to one or more of the focus student's strengths or weaknesses is addressed in relation to the feedback given.

**What distinguishes a Level 5 from a Level 4:** At Level 5,

- The candidate describes planned or implemented support for the focus students to understand and use feedback on their strengths **AND** weaknesses related to the learning objectives.

# Assessment Rubric 14: Analyzing Students' Language Use and Technology and Engineering Education Learning

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**TED14: How does the candidate analyze students' use of language to develop content understanding?**

## The Guiding Question

The Guiding Question addresses how the candidate explains students' use of the identified language demands and how that use demonstrates and develops technology and engineering education understandings.

## Key Concepts of Rubric:

**Use the definitions below and the subject-specific Academic Language handout to further clarify concepts on Rubric 14.**

- **language demands**—Specific ways that academic language (vocabulary and/or symbols, functions, discourse, syntax, visual representation) is used by students to participate in learning tasks through reading, writing, listening, and/or speaking to demonstrate their disciplinary understanding.
- **language functions**—Purpose for which language is used. The content and language focus of the learning task, often represented by the active verbs within the learning outcomes. Common language functions in technology and engineering education include **describing** phenomena, **predicting** from models and data, **comparing** based on common attributes, **summarizing** information in schematics, charts, or graphs, **justifying** conclusions, **evaluating** data and visual representations, **classifying** based on attributes, **explaining** phenomena and processes, **drawing conclusions** based on data, and so on.
- **vocabulary**—Words and phrases that are used within disciplines including: (1) words and phrases with subject-specific meanings that differ from meanings used in everyday life (e.g., table, solution, code); (2) general academic vocabulary used across disciplines (e.g., compare, analyze, evaluate); and (3) subject-specific words defined for use in the discipline.
- **discourse**—How members of the discipline talk, write, and participate in knowledge construction, using the structures of written and oral language. Discipline-specific discourse has distinctive features or ways of structuring oral or written language (text structures) or representing knowledge visually that provide useful ways for the content to be communicated.<sup>8</sup> In technology and engineering, language structures include graphic representation (including schematics, drawings, and physical models), and narrative structures (e.g., critiques, research reports, implementation reviews). If the language function is to critique a design, the critique would be structured to include sections about

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<sup>8</sup> Quinn, H., Lee, O., & Valdés, G. (2012). Language demands and opportunities in relation to next generation science standards for ELLs. Retrieved from <http://ell.stanford.edu/sites/default/files/pdf/academic-papers/03-Quinn%20Lee%20Valdes%20Language%20and%20Opportunities%20in%20Science%20FINAL.pdf>

the options considered, rationale for choices made, and how well the design meets the established criteria.<sup>9</sup>

- **syntax**—The rules for organizing words or symbols together into phrases, clauses, sentences or visual representations (e.g., graphs, tables, schematics). One of the main functions of syntax is to organize language in order to convey meaning.
- **language supports**—The scaffolds, representations, and pedagogical strategies teachers intentionally provide to help learners understand and use the concepts and language they need to learn within disciplines. The language supports planned within the lessons in edTPA should directly support learners to understand and use identified language demands (vocabulary and/or symbols, language function, visual representation, and syntax or discourse) to deepen content understandings.

### Primary Sources of Evidence:

Assessment Commentary **Prompt 3**

Evidence of Student Language Use (student work samples and/or video evidence)

## Scoring Decision Rules

▶ <b>Multiple Criteria</b>	■ N/A for this rubric
▶ <b>AUTOMATIC 1</b>	■ None

## Unpacking Rubric Levels

### Level 3

#### Evidence that demonstrates performance at Level 3:

- The candidate explains and identifies evidence that the students used or attempted to use the language function AND one additional language demand (vocabulary and/or symbols, syntax, discourse, or visual representation). Note: The language demands discussed in the Assessment Commentary do not have to be the same as those discussed in Task 1.
- It is not sufficient for the candidate to reference a work artifact and make a general statement, for example, "As seen in the work samples, the student used the vocabulary as they described the initial design of the race car." The candidate must explain how the students used the identified language and reference or identify an example of that use from the artifact, e.g., "Students 1 used the correct vocabulary and referred to a schematic to as she described how her team designed the race car. Students 2 and 3 used a mixture of correct vocabulary and everyday language in the description but the rough sketches of the final design that did not always match the descriptions."

<sup>9</sup> Examples for glossary terms in the Technology and Engineering Education Handbook will represent content areas, such as mathematics or science, instead of technologies, due to the fact that technology and engineering are the tools through which content area understandings are achieved.

## Below 3

### **Evidence that demonstrates performance below 3:**

- The candidate's identification of student's language use is not aligned with the language demands or limited to one language demand.

### **What distinguishes a Level 2 from a Level 3:** At Level 2,

- The candidate's description and/or evidence of students' language use is limited to only one language demand (vocabulary and/or symbols, function, syntax, discourse, or visual representation).

### **What distinguishes a Level 1 from a Level 2:** At Level 1,

- The candidate identifies language use that is unrelated or not clearly related to the language demands (function, vocabulary and/or symbols, syntax, discourse, visual representation) addressed in the Assessment commentary.
- Candidate's description or explanation of language use is not consistent with the evidence provided.

## Above 3

### **Evidence that demonstrates performance above 3:**

- Candidate identifies specific evidence of student use of the language function and vocabulary and/or symbols, along with at least one other language demand (syntax, discourse, and/or visual representation).
- Candidate explains how evidence of student language represents their development of content understandings, which may include growth and/or struggles with both understanding and expressing content understandings.
- Candidate explains and provides evidence of language use and content learning for students with distinct language needs.

### **What distinguishes a Level 4 from a Level 3:** At Level 4,

- The candidate identifies and explains concrete evidence that students are able to use the language function, vocabulary and/or symbols, AND associated language demands (syntax, discourse, and/or visual representation). The explanation uses specific evidence from the video and/or work samples.
- The candidate's analysis includes evidence of how student language use demonstrates growth and/or struggles in developing content understandings. For example, the candidate notes that, "All students could give a complete explanation using some commonly used vocabulary words, like line segment, orthographic view, isometric view and perspective view in the context of their explanations (e.g., see these terms used in the explanations of their drawing in the work samples from Students 1, 2, and 3). Most of the students could produce detailed drawings of 2D objects, as shown by the labeled dimensions and the correspondence to the 3D object represented in the different views in the work samples from Students 2 and 3. However, many students were unable to correctly identify the views of the drawings without physically seeing the different sides of the package, e.g., work sample from Student 1 where the student does not explain this view but says "I don't know." This suggests that some students need remediation with the conceptual understanding to recognize which sides appear where on an abstract layout."

**What distinguishes a Level 5 from a Level 4:** At Level 5, the candidate meets Level 4  
**AND**

- Explains and provides concrete evidence that students with distinct language needs are using the language for content learning.

# Assessment Rubric 15: Using Assessment to Inform Instruction

**TED15: How does the candidate use the analysis of what students know and are able to do to plan next steps in instruction?**

## The Guiding Question

The Guiding Question addresses how the candidate uses conclusions from the analysis of student work and research or theory to propose the next steps of instruction. Next steps should be related to the standards/objectives assessed and based on the assessment that was analyzed. They also should address the whole class, groups with similar needs, and/or individual students.

## Key Concepts of Rubric:

- N/A

### Primary Sources of Evidence:

Assessment Commentary **Prompt 4**

## Scoring Decision Rules

▶ <b>Multiple Criteria</b>	<ul style="list-style-type: none"><li>■ Criterion 1 (primary): Next steps for instruction</li><li>■ Criterion 2: Connections to research/theory</li><li>■ Place greater weight or consideration on criterion 1 (next steps for instruction).</li></ul>
▶ <b>AUTOMATIC 1</b>	<ul style="list-style-type: none"><li>■ None</li></ul>

## Unpacking Rubric Levels

### Level 3

#### Evidence that demonstrates performance at Level 3:

- *Primary Criterion:* The next steps focus on support for student learning that is general for the whole class, not specifically targeted for individual students. The support addresses learning related to the learning objectives that were assessed.
- *Secondary Criterion:* The candidate refers to research or theory when describing the next steps. The connections between the research/theory and the next steps are vague/not clearly made.
- If evidence meets the primary criterion at Level 3, the rubric is scored at Level 3 **regardless of the evidence for the secondary criterion.**
- If evidence meets the primary criterion at Level 4, and candidate has NO connection to research/theory, the rubric is scored at Level 3.

## Below 3

### Evidence that demonstrates performance below 3:

- The next steps are not directly focused on student learning needs that were identified in the analysis of the assessment.
- Candidate does not explain how next steps are related to student learning.

### What distinguishes Level 2 from Level 3: At Level 2,

- The next steps are related to the analysis of student learning and the standards and learning objectives assessed.
- The next steps address improvements in teaching practice that mainly focus on how the candidate structures or organizes learning tasks, with a superficial connection to student learning. There is little detail on the changes in relation to the assessed student learning. Examples include repeating instruction or focusing on improving conditions for learning such as pacing or classroom management, with no clear connections to how changes address the student learning needs identified.

### What distinguishes Level 1 from Level 2: There are **three different ways** that evidence is scored at Level 1:

1. Next steps **do not follow from** the analysis.
2. Next steps are **unrelated to the standards and learning objectives** assessed.
3. Next steps are **not described in sufficient detail** to understand them, e.g., "more practice" or "go over the test."

## Above 3

### Evidence that demonstrates performance above 3:

- Next steps are based on the assessment results and provide scaffolded or structured support that is directly focused on specific student learning needs related to conceptual understanding, procedural fluency, and/or problem-solving/reasoning skills.
- Next steps are supported by research and/or theory.

### What distinguishes Level 4 from Level 3: At Level 4,

- The next steps are clearly aimed at supporting specific student needs for either individuals (2 or more students) or groups with similar needs related to one or more of the three areas of technology learning (conceptual understanding, technical skills, OR engineering design or other problem-solving strategies). Candidate should be explicit about how next steps will strategically support individuals or groups and explain how that support will address each individual or group's needs in relation to the area of technology learning.
- The candidate discusses how the research or theory is related to the next steps in ways that make some level of sense given their students and central focus. They may cite the research or theory in their discussion, or they may refer to the ideas from the research. Either is acceptable, as long as they clearly connect the research/theory to their next steps.
- Scoring decision rules: To score at Level 4, the candidate must meet the primary criterion at Level 4 and make at least a fleeting, relevant reference to research or theory (meet the second criterion at least at Level 3).

**What distinguishes Level 5 from Level 4: At Level 5,**

- The next steps are clearly aimed at supporting specific student needs for both individuals and groups with similar needs related to all three areas of technology learning (conceptual understanding, technical skills, AND engineering design or other problem-solving strategies). Candidate should be explicit about how next steps will strategically support individuals and groups and explain how that support will address each individual's and group's needs in relation to the areas of technology learning.
- The candidate explains how principles of research or theory support the proposed changes, with clear connections between the principles and the next steps. The explanations are explicit, well-articulated, and demonstrate a thorough understanding of the research or theoretical principles involved.