



Adolescence and Young Adulthood

SCIENCE

Scoring Guide *for Candidates*

- **Part 1** provides you with the tools to understand and interpret your scores.
- **Part 2** provides the scoring rubrics for your certificate area, guiding you as you develop your portfolio entries and prepare for your assessment center exercises.

*National Board Certification
Promotes Better Teaching,
Better Learning, Better Schools*

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About This Scoring Guide

The *Scoring Guide for Candidates* is a comprehensive overview of the National Board's scoring process. It is essential reading for anyone pursuing National Board Certification®. Together the two parts of the *Scoring Guide for Candidates* will help you on your path toward becoming a National Board Certified Teacher® (NBCT®).

Part 1: Understanding and Interpreting Your Scores

Part 1 guides you through the scoring process, providing you with the tools to understand and interpret your scores. Applicable to all certificate areas, **Part 1** includes crucial information about the role of the National Board Standards, which represent a professional consensus on the critical aspects of practice that distinguish accomplished teachers in the field and function as the foundation of each assessment.

Additionally, you will find information in **Part 1** about NBPTS® assessors—the qualified professionals who assign your scores. You will also find the score ranges, which will allow you to match your score to the appropriate level of performance. **Part 1** also discusses the National Board's retake policies, relevant to you if you do not meet the performance standard on your initial certification attempt. In **Part 1** you will learn how to interpret your individual scores and, if necessary, develop strategies to improve them.

Part 2: Understanding and Applying the Scoring Criteria

Part 2 provides the scoring rubrics for each portfolio entry and assessment center exercise in your certificate area, guiding you as you develop your portfolio entries and prepare for your assessment center exercises. The rubrics are presented here in a bulleted format to highlight the vital information contained in each. Reading the scoring rubrics will help you think about ways to strengthen your practice and best demonstrate your teaching expertise. The rubrics are the tool that assessors use to determine the appropriate scores for performance in your field.

The NBPTS Web site provides additional documents to assist you in the process of developing your portfolio entries and evaluating your performance. One such document is the [Evaluation of Evidence Guide](#). Each certificate-specific guide corresponds to an individual portfolio entry for your certificate area, and each includes questions that shape how assessors view the evidence you submit.

Other resources that will help you prepare for your assessment include the following certificate-specific documents, all of which are available online at www.nbpts.org:

- *Assessment at a Glance*
- Standards for Accomplished Teaching
- *Portfolio Instructions*



Part 1:

Understanding and Interpreting Your Scores

This resource is available as a PDF file. You may select the link below to view or print **Part 1**.

[Scoring Guide for Candidates, Part 1: Understanding and Interpreting Your Scores](#)



Part 2:

Understanding and Applying the Scoring Criteria

Part 2: Understanding and Applying the Scoring Criteria presents the scoring rubrics for your certificate area. You should read the rubrics while developing your portfolio entries and preparing for your assessment center exercises. These rubrics, which are derived from the Standards, define the levels of accomplished teaching that you must demonstrate. This reference information will help you understand how the rubrics guide assessors in evaluating your work.

Each rubric begins with an overarching statement that summarizes the quality of performance at each of the rubric levels. For example, the overarching statement for a Level 4 rubric might read: "The Level 4 performance provides *clear, consistent, and convincing* evidence of the teacher's knowledge and practice in his or her field." This precise language is used to distinguish between the four levels of the score scale. The body of the rubric consists of statements organized in a manner that reflects the order of tasks or questions within the entry or exercise. If you are asked to discuss your goals in the first response, for example, then the quality statement about goals will be stated at the beginning of the body of the rubric.

One way to understand the meaning of the entire rubric and how it relates to the quality of a performance is to read across the rubric. You can do this by reading the first sentence for Level 4, the first sentence for Level 3, and so on. This reveals the gradations of quality delineated for each feature of the response. A careful reading of the rubrics is an invaluable step in helping you successfully develop your portfolio entries and prepare for your assessment center exercises.

Your portfolio entries and assessment center exercises are scored holistically. To score holistically, an assessor must look at the entry and exercise for its overall quality and evaluate the work as a whole. The response may have characteristics of adjacent performance levels, but the assessor must assign the score that best describes the work as a whole. When scoring, an assessor reads completely, and views, when applicable, the entire entry and exercise before assigning a score. An assessor should read and review supportively, looking for and rewarding those things done well in the entry or exercise.

For more information about understanding and interpreting your scores, please refer to **Part 1**.

Contents:

- Scoring Rubrics for Portfolio Entries
- Scoring Rubrics for Assessment Center Exercises

Scoring Rubrics for Portfolio Entries

Entry 1: Teaching a Major Idea over Time

In this entry: You choose three instructional activities, related instructional materials, two student responses to each activity, a culminating assessment, and submit a Written Commentary. Your submission should demonstrate your strategies for linking instructional activities together to engage students in building conceptual understanding of one major idea in science.

THE LEVEL 4 performance provides *clear, consistent, and convincing* evidence that the teacher is able to select and justify the appropriateness of a major idea in science, plan and implement sequenced instruction, and provide appropriate assessment to facilitate students' understanding of that idea.

The Level 4 performance provides *clear, consistent, and convincing* evidence:

- that the teacher is able to establish the selected major idea and related learning goals as central to science and justify them as appropriate for his or her students and specific teaching context.
- that the instructional activities work together to further the stated learning goals in a logical sequence that allows students to actively explore the major idea. It also deepens their conceptual understanding of the major idea, and situates the major idea within a broader context in a way that establishes direct connections to students' prior knowledge, experience, and other disciplines.
- that the instructional sequence reflects consideration of the unique learning needs of students, shows high expectations for all students, and demonstrates proficiency in recognizing the challenges of teaching this idea and sequence, including assessment of potential student misunderstandings and how to address these misunderstandings through appropriate pedagogical responses.
- that the teacher uses an integrated approach to assessment that furthers high and appropriate learning goals and enhances instruction.
- that the teacher's rationale for the assessments, including the culminating assessment, is appropriate given the instructional context and the stated learning goals for these students.
- of the teacher's strong command of science content linked with appropriate science pedagogy.
- that the teacher is able to describe, analyze, and evaluate students' work, showing knowledge of students and insight into their learning.
- of the teacher's ability to be resourceful in adapting and/or creating rich and appropriate instructional resources, including the use of appropriate technologies, to enhance student learning about science.

- that the teacher is able to engage in reflective thinking that describes his or her practice accurately, analyzes it fully and thoughtfully, and reflects on its implications and significance for future teaching.

Overall, there is *clear, consistent, and convincing* evidence that the teacher is able to plan and implement sequenced instruction of a major idea in science to facilitate his or her students' understanding of that idea.

THE LEVEL 3 performance provides *clear* evidence that the teacher is able to select and justify the appropriateness of a major idea in science, plan and implement sequenced instruction, and provide appropriate assessment to facilitate students' understanding of that idea.

The Level 3 performance provides *clear* evidence:

- that the teacher is able to establish the selected major idea and related learning goals as central to science and justify them as appropriate for his or her students and specific teaching context. However, the rationale may not be as strong or consistently articulated as in the Level 4 performance.
- that the instructional activities work together to further the stated learning goals in a logical sequence that allows students to actively explore the major idea. It allows the students to deepen their conceptual understanding of the major idea and to situate the major idea within a broader context in a way that establishes direct connections to students' prior knowledge, experience, and other disciplines. However, the evidence may not be as consistent and/or may not lead to as deep an understanding in science as in the Level 4 performance.
- that the instructional sequence reflects consideration of the unique learning needs of students, shows high expectations for all students, and demonstrates proficiency in recognizing the challenges of teaching this idea and sequence, including awareness of potential student misunderstandings and how to address these misunderstandings through appropriate pedagogical responses.
- that the teacher uses an integrated approach to assessment that furthers high and appropriate learning goals and enhances instruction.
- that the teacher's rationale for the assessments and the culminating assessment is appropriate given the instructional context and the stated learning goals for these students, though the rationale may not be as strong or consistently articulated as in a Level 4 performance.
- of the teacher's strong command of science content linked with appropriate science pedagogy.
- that the teacher is able to describe, analyze, and evaluate students' work, showing knowledge of students and insight into their learning, though the analysis may not be as insightful or detailed as in a Level 4 performance.
- of the teacher's ability to be resourceful in adapting and/or creating appropriate instructional resources, including the use of appropriate technologies, to enhance student learning about science, although the activities may not be as well designed as those seen in a Level 4 performance.
- that the teacher is able to engage in reflective thinking that describes his or her practice accurately, analyzes it fully and thoughtfully, and reflects on its implications and significance for future teaching, although the reflection may not be as consistent, detailed, or insightful as in a Level 4 performance.

The Level 3 performance may show some inconsistency and imbalance in the analysis or in the sources of evidence. One part of the performance may be more indicative of accomplished practice than the other, but viewed as a whole, there still remains *clear* evidence that the teacher is able to plan and implement sequenced instruction of a major idea in science to facilitate his or her students' understanding of that idea.

THE LEVEL 2 performance provides *limited* evidence that the teacher is able to select and justify the appropriateness of a major idea in science, plan and implement sequenced instruction, and provide appropriate assessment to facilitate students' understanding of that idea.

The Level 2 performance provides *limited* evidence:

- that the teacher is able to establish the selected major idea and related learning goals as central to science and justify them as appropriate for his or her students. The goals may be vague, of limited significance, or only loosely related to instruction.
- that the instructional activities work together to further the stated learning goals. The connections to students' prior knowledge and experience and other disciplines may be somewhat vague and/or may not work well together to deepen students' conceptual understanding of the major idea.
- that the instructional sequence reflects consideration of the unique learning needs of students or shows high expectations for all students.
- that the teacher demonstrates proficiency in recognizing the challenges of teaching this idea and sequence, and shows limited awareness of potential student misunderstandings and/or how to address these misunderstandings.
- that the teacher uses an integrated approach to assessment that furthers the learning goals and enhances instruction. The teacher's rationale for the assessments and the culminating assessment is somewhat weak or unclear and the assessments may only be loosely tied to the learning goals.
- of the teacher's own command of science content and science pedagogy.
- that the teacher is able to describe, analyze, and evaluate students' work, and the analysis may consist largely of what each student got "right" and "wrong" or focus primarily on affective issues such as engagement of students.
- of the teacher's ability to be resourceful in adapting and/or creating appropriate instructional resources, including the use of appropriate technologies, to enhance student learning about science. Although they may have students involved in activities, the activities may lack intellectual value or substance. The activities may emphasize procedural skills or factual recall over scientific understanding.
- that the teacher is able to engage in reflective thinking about his or her practice. The reflection may be oversimplified or sketchy and show limited understanding of implications and significance for future teaching.

The Level 2 performance may be characterized by evidence that hints at accomplished practice, but overall, there is *limited* evidence that the teacher is able to plan and implement sequenced instruction of a major idea in science to facilitate his or her students' understanding of that idea.

THE LEVEL 1 performance provides *little or no* evidence that the teacher is able to select and justify the appropriateness of a major idea in science for his or her students, and to plan and implement sequenced instruction to facilitate students' understanding of that idea.

The Level 1 performance provides *little or no* evidence:

- that the teacher is able to establish the selected major idea and related learning goals as central to science and justify them as appropriate for his or her students. The goals may not be goals at all, but rather activities. When stated, goals are trivial, inappropriate, or unrelated to instruction.
- that the instructional activities work together to further the stated learning goals. The activities may be trivial or cover the science topic in a superficial manner and may not work well together to deepen students' conceptual understanding of the major idea. There may not be any connections to students' prior knowledge, experience, or other disciplines.
- that the instructional sequence reflects consideration of the unique learning needs of students or shows high expectations for all students.
- that the teacher demonstrates proficiency in recognizing the challenges of teaching this idea and sequence and shows little or no awareness of potential student misunderstandings or how to address these misunderstandings.
- that the teacher uses an integrated approach to assessment that furthers the learning goals or enhances instruction. The goals are unclear or may be missing.
The teacher shows little or no rationale for the assessments and the culminating assessment.
- of the teacher's own command of science content or pedagogy, and there may even be indications that he or she has some science misunderstandings.
- that the teacher is able to describe, analyze, and evaluate students' work. Analysis may consist solely of what each student got "right" and "wrong."
- of the teacher's ability to be resourceful in adapting and/or creating appropriate instructional resources, including the use of appropriate technologies, to enhance student learning about science. The activities may require students to simply recall information, participate in superficial activities, or complete "fill-in-the-blank" types of assignments.
- that the teacher is able to engage in reflective thinking that describes and analyzes his or her practice and understands its implications and significance for future teaching. The reflection may be missing or unrelated to the instructional evidence.

Overall, there is *little or no* evidence that the teacher is able to plan and implement sequenced instruction of a major idea in science to facilitate his or her students' understanding of that idea.

Entry 2: Active Scientific Inquiry

In this entry: You submit a 20-minute video recording of your interactions with students engaged in different stages of the inquiry process during a scientific investigation. You also provide a Written Commentary that analyzes your teaching throughout this process of scientific inquiry.

THE LEVEL 4 performance provides *clear, consistent, and convincing* evidence that the teacher is able to facilitate and support student learning through scientific inquiry as students actively engage in a science investigation.

The Level 4 performance provides *clear, consistent, and convincing* evidence:

- that the teacher establishes the investigation and related learning goals as central to science and justifies them as appropriate for his or her students and specific teaching context.
- that the teacher's instructional strategies develop students' abilities to engage in scientific inquiry and support inquiry processes at different critical points of an investigation.
- that the strategies assist the students in conceptualizing investigations as they collect, process, and analyze data, and as they communicate their findings.
- that the teacher's teaching strategies reflect consideration of the unique learning needs of the students, show high expectations for all students, and demonstrate proficiency in recognizing the challenges of developing scientific understanding through inquiry.
- of the teacher's strong command of science content linked with appropriate science instruction.
- of the teacher's ability to accurately describe, analyze, and evaluate classroom interactions, showing knowledge of students and insight into their learning.
- that the teacher is resourceful in adapting and/or creating rich and appropriate instructional resources to support and extend student learning through scientific investigation.
- that the teacher is able to foster an equitable, accessible, and fair learning environment that encourages students to participate in science inquiry.
- that the teacher is able to describe his or her practice accurately, analyze it fully and thoughtfully, and reflect on its implications and significance for future teaching.

Overall, there is *clear, consistent, and convincing* evidence that the teacher is able to facilitate and support student learning through scientific inquiry as students actively engage in a science investigation.

THE LEVEL 3 performance provides *clear* evidence that the teacher is able to facilitate and support student learning through scientific inquiry as students actively engage in a science investigation.

The Level 3 performance provides *clear* evidence:

- that the teacher establishes the investigation and related learning goals as central to science and justifies them as appropriate for his or her students and specific teaching context.
- that the teacher's instructional strategies develop students' abilities to engage in scientific inquiry and support inquiry processes at different critical points of an investigation.
- that the strategies assist the students in conceptualizing investigations as they collect, process, and analyze data, and as they communicate their findings. However, the stages of the investigation may not be as adeptly sequenced, consistently structured, or establish every critical point of the inquiry process as in a Level 4 performance.
- that the teacher's teaching strategies reflect consideration of the unique learning needs of the students, show high expectations for all students, and demonstrate proficiency in recognizing the challenges of developing scientific understanding through inquiry.
- of the teacher's strong command of science content linked with appropriate science instruction in an effective, equitable, and safe learning environment.
- that the teacher is able to foster an equitable, accessible, and fair learning environment that encourages students to participate in science inquiry.
- of the teacher's ability to accurately describe, analyze, and evaluate classroom interactions, showing knowledge of students and insight into their learning; however the analysis and evaluation may not be as consistent, insightful, or detailed as a Level 4 performance.
- that the teacher is resourceful in adapting and/or creating appropriate instructional resources to support and extend student learning.
- that the teacher is able to describe his or her practice accurately, analyze it, and reflect on its implications and significance for future teaching, although the reflection may not be as consistently detailed or as instructive as in a Level 4 performance.

The Level 3 performance may show some inconsistency and imbalance in the analysis or in the sources of evidence. One part of the performance may be more indicative of accomplished practice than the other, but viewed as a whole, there still remains *clear* evidence that the teacher is able to facilitate and support student learning through scientific inquiry as students actively engage in a science investigation.

THE LEVEL 2 performance provides *limited* evidence that the teacher is able to facilitate and support student learning through scientific inquiry as students actively engage in a science investigation.

The Level 2 performance provides *limited* evidence:

- that the teacher establishes the investigation and related learning goals as central to science and justifies them as appropriate for his or her students and specific teaching context. The goals for student learning may be vague, of limited significance, or only loosely related to the investigation.
- that the teacher’s instructional strategies develop students’ abilities to engage in scientific inquiry at different critical points of an investigation, and sufficiently challenge the student.
- that the strategies support students in the inquiry process as they conceptualize investigations, collect, process, and analyze data, and communicate their findings. The investigation may be largely focused on “right-answer” cookbook-type responses from the students and concentrate primarily on only the right answer rather than scientific inquiry.
- that the teacher’s teaching strategies reflect consideration of the learning needs of the students, with little differentiation among learners. High expectations for all students may not be readily apparent.
- of the teacher’s strong command of science content or appropriate science instruction.
- that the teacher is able to foster an equitable, accessible, and fair learning environment that encourages students to participate in science inquiry.
- of the teacher’s ability to accurately describe, analyze, and evaluate classroom interactions, showing only superficial knowledge of students or insight into their learning.
- that the teacher is resourceful in adapting and/or creating appropriate instructional resources to support and extend student learning through scientific investigation.
- that the teacher is able to describe his or her practice accurately, analyze it fully and thoughtfully, or use reflection to modify practice. The reflection may be oversimplified or sketchy and show limited understanding of implications and significance for future teaching.

The Level 2 performance may be characterized by evidence that hints at accomplished practice, but overall, there is *limited* evidence that the teacher uses active scientific inquiry to further worthwhile and appropriate learning goals and facilitate students’ individual growth as science learners.

THE LEVEL 1 performance provides *little or no* evidence that the teacher is able to facilitate and support student learning through scientific inquiry as students actively engage in a science investigation.

The Level 1 performance provides *little or no* evidence:

- that the teacher establishes the investigation and related learning goals as central to science and justifies them as appropriate for his or her students and specific teaching context. When stated, goals are vague, trivial, inappropriate, or unrelated to the investigation.
- that the teacher's instructional strategies develop students' abilities to engage in scientific inquiry or support the inquiry process at different critical points of an investigation. The level of challenge may be very low and there is little or no evidence that the strategies assist the students in conceptualizing investigations as they collect, process, and analyze data, and as they communicate their findings.
- that the teacher's teaching strategies reflect consideration of the learning needs of the students, high expectations for all students, and developing scientific understanding through inquiry.
- of the teacher's strong command of science content or appropriate science instruction and there may even be indications of mild to serious content errors from the teacher. The interactions may reveal inappropriate, negative responses to students that prevent fostering an equitable, accessible, and fair learning environment that encourages students to participate in science inquiry.
- of the teacher's ability to accurately describe, analyze, or evaluate classroom interactions, showing only superficial knowledge of students and insight into their learning.
- that the teacher is resourceful in adapting and/or creating appropriate instructional resources to support and extend student learning.
- that the teacher is able to describe his or her practice accurately, analyze it fully and thoughtfully, and reflect on its implications and significance for future teaching. The reflection may be missing or unrelated to the investigation.

Overall, there is *little or no* evidence that the teacher uses active scientific inquiry to further worthwhile and appropriate learning goals and facilitate students' individual growth as science learners.

Entry 3: Whole-Class Discussions about Science

In this entry: You submit a 20-minute video recording of your interactions with students as they actively gain an ability to understand and use scientific concepts and problem-solving skills. You also provide a Written Commentary that analyzes your teaching through whole-class discussion.

THE LEVEL 4 performance provides *clear, consistent, and convincing* evidence that the teacher is able to facilitate and support student understanding of important scientific ideas through classroom discourse.

The Level 4 performance provides *clear, consistent, and convincing* evidence:

- of the teacher's ability to engage students in discourse about a significant scientific theory, concept, principle, issue, or methodological approach.
- that the teacher sets appropriate and worthwhile goals for student learning, with careful consideration given to the advancement of those goals by placing this discussion in a larger context of instruction further enhancing student learning.
- of the teacher's strong command of science content linked with appropriate science instruction.
- of the teacher's ability to establish and manage an equitable, accessible, fair, and productive learning environment in which questioning, prompting, and other instructional strategies elicit scientific reasoning and thinking on the part of students. Discourse on the video recording is characterized by active verbal exchange, with students' questions, conjectures, and interactions (student-student and teacher-student) demonstrating scientific reasoning.
- that the feedback in the classroom is frequent, supportive, and allows for, and in fact ensures, the participation of all students to enhance student learning.
- that the teacher engages in reflective thinking and is able to describe his or her practice accurately, analyze it fully and thoughtfully, and reflect on its implications and significance for future teaching.

Overall, there is *clear, consistent, and convincing* evidence that the teacher is able to facilitate and support student understanding of important scientific ideas through rich classroom discourse.

THE LEVEL 3 performance provides *clear* evidence that the teacher is able to facilitate and support student understanding of important scientific ideas through classroom discourse.

The Level 3 performance provides *clear* evidence:

- of the teacher's ability to engage students in discourse about a significant scientific theory, concept, principle, issue, or methodological approach.
- that the teacher sets appropriate and worthwhile goals for student learning, although the placement of this discussion in the larger context of instruction may or may not be reinforced as consistently or as focused as a Level 4 performance.
- of the teacher's command of science content linked with appropriate science instruction.
- of the teacher's ability to establish and manage an equitable, accessible, fair, and productive learning environment in which questioning, prompting, and other instructional strategies elicit scientific reasoning and thinking on the part of students. Discourse on the video recording is characterized by active verbal exchange, although there may not be as much evidence of student-to-student interactions or consistency in demonstrating scientific reasoning.
- that the feedback in the classroom is frequent, supportive, and encourages and enhances student learning for all students.
- that the teacher engages in reflective thinking and is able to describe his or her practice accurately, analyze it, and reflect on its implications and significance for future instruction. However, the reflection may not be as consistently detailed or insightful as in a Level 4 performance.

A Level 3 performance may show some imbalance in the analysis or in the sources of evidence. One part of the performance may be more indicative of accomplished practice than the other, but viewed as a whole, there remains *clear* evidence that the teacher is able to facilitate and support student understanding of important scientific ideas through classroom discourse.

THE LEVEL 2 performance provides *limited* evidence that the teacher is able to facilitate and support student understanding of important scientific ideas through classroom discourse.

The Level 2 performance provides *limited* evidence:

- of the teacher's ability to engage students in discourse about a significant scientific theory, concept, principle, issue, or methodological approach.
- that the teacher sets appropriate and worthwhile goals for student learning. The goals for student learning may be vague, of limited significance, or only loosely related to the instruction.
- that this particular lesson has been placed in the larger context of instruction designed to enhance student learning in science.
- of the teacher's command of science content linked with appropriate science instruction.
- of the teacher's ability to establish and manage an equitable, accessible, fair, and productive learning environment. Scientific discourse on the video recording may be limited and there is limited evidence that the teacher uses questions and prompts to elicit scientific thinking and reasoning from the students. Though generally focused on science, the discourse on the video recording may be characterized chiefly by "right-answer" questions, recall of information, or lack of focus, with limited evidence of student engagement or ability to reason scientifically.
- of feedback to students and feedback offered may not be substantive or focused on science.
- of the teacher's ability to ensure that all students are encouraged to participate in the study and discussion of science. Only a few students may dominate the class, with many others disengaged from the discussion.
- that the teacher is able to describe, analyze, or reflect on his or her practice to modify and improve instruction. The reflection may be oversimplified or sketchy and show limited understanding of implications and significance for future teaching.

The Level 2 performance may be characterized by evidence that hints at accomplished practice, but overall, there is *limited* evidence that the teacher is able to facilitate and support student understanding of important scientific ideas through classroom discourse.

THE LEVEL 1 performance provides *little or no* evidence that the teacher is able to facilitate and support student understanding of important scientific ideas through classroom discourse.

The Level 1 performance provides *little or no* evidence:

- of the teacher's ability to engage students in discourse about a significant scientific theory, concept, principle, issue, or methodological approach.
- that the teacher sets appropriate and worthwhile goals for student learning. They may be missing or stated in terms that are vague, trivial, inappropriate, or unrelated to instruction.
- that this particular lesson has been placed in the larger context of instruction designed to enhance student learning in science.
- of the teacher's command of science content or appropriate science instruction. Errors in content may even be apparent from the teacher.
- of the teacher's ability to establish and manage an equitable, accessible, fair, and productive learning environment.
- of scientific discourse on the video recording, with little or no evidence that the teacher uses questions and prompts to elicit scientific thinking and reasoning from the students. The event featured on the video recording may not be a discussion at all, or may not address science. The questioning techniques employed by the teacher may be entirely closed-ended and focused on a superficial aspect of the topic under study, with little or no evidence of student engagement.
- of feedback to students and any feedback offered is not substantive or about science.
- of the teacher's ability to ensure that all students are encouraged to participate in the study and discussion of science. In fact, student disengagement might be the general rule.
- that the teacher is able to engage in reflective thinking. The reflection may be missing or unrelated to the instructional evidence and show little or no understanding of implications and significance for future teaching.

Overall, there is *little or no* evidence that the teacher is able to facilitate and support student understanding of important scientific ideas through classroom discourse.

Entry 4: Documented Accomplishments: Contributions to Student Learning

In this entry: You illustrate your partnerships with students' families and community, and your development as a learner and collaborator with other professionals by submitting descriptions and documentation of your activities and accomplishments in those areas. Your description must make the connection between each accomplishment and its impact on student learning.

THE LEVEL 4 performance provides *clear, consistent, and convincing* evidence of the teacher's ability to impact student learning through work with colleagues, professionals, families, and the community, and as a learner.

The Level 4 performance provides *clear, consistent, and convincing* evidence:

- that the teacher treats parents and other interested adults as valued partners in the child's education, and uses thoughtfully chosen, appropriate strategies for reaching out to the families of his or her students. The selected strategies may or may not be original to the teacher, but they are implemented with skill and enthusiasm and are effective in engaging parents and other interested adults in communication that is highly interactive, fostering extensive two-way dialogue focused primarily on substantive teaching and learning issues and individual student progress.
- that the teacher facilitates ongoing, mutually beneficial communications between students and the wider community in a way that enhances teaching and learning.
- that the teacher has strengthened his or her own teaching practice through conscious and deliberate professional development to strengthen knowledge, skills, and abilities in areas that are relevant to his or her teaching and learning context for the purpose of impacting student learning.
- that the teacher has worked collaboratively with colleagues to improve teaching and learning, either within the school or in the wider professional community.
- that the teacher has shared his or her expertise in a leadership role with other educators through facilitating the professional development of other teachers, improving instructional practices, or advocating for positive change in educational policy.
- that the teacher's work outside the classroom has been driven by a conscious and deliberate focus on improving teaching and learning, as opposed to merely fulfilling job requirements. The descriptions and documentation provide a rich, detailed, coherent view of a teacher who has made an impact on student learning through work with other colleagues, professionals, families, and the community, and as a learner.
- that the teacher accurately analyzes and thoughtfully reflects on the significance of all accomplishments taken together, and can appropriately plan for future opportunities to impact student learning.

Overall, there is *clear, consistent, and convincing* evidence of the teacher's ability to impact student learning through work with colleagues, professionals, families, and the community, and as a learner.

THE LEVEL 3 performance provides *clear* evidence of the teacher's ability to impact student learning through work with colleagues, professionals, families, and the community, and as a learner.

The Level 3 performance provides *clear* evidence:

- that the teacher treats parents and other interested adults as valued partners in the child's education, and uses appropriate strategies for reaching out to the families of his or her students. The selected strategies may or may not be original to the teacher, but they are effective in engaging parents and other interested adults in communication that is interactive, fostering two-way dialogue focused primarily on substantive teaching and learning issues and individual student progress.
- that the teacher facilitates ongoing, mutually beneficial communications between students and the wider community in a way that enhances teaching and learning, although the communications may not be as effective as those in a Level 4 performance.
- that the teacher has strengthened his or her own teaching practice through conscious and deliberate professional development to strengthen knowledge, skills, and abilities in areas that are relevant to his or her teaching and learning context.
- that the teacher has worked with colleagues as a partner or collaborator to improve teaching and learning, either within the school or in a larger professional context, such as within a professional organization.
- that the teacher has shared his or her expertise in a leadership role with other educators through facilitating the professional development of other teachers, improving instructional practices, or advocating for positive changes in educational policy.
- that the teacher's work outside the classroom has been driven by a conscious focus on improving teaching and learning, as opposed to merely fulfilling job requirements. The descriptions and evidence provide a coherent view of a teacher who has made an impact on student learning through work with other colleagues, professionals, families, and the community, and as a learner.
- that the teacher accurately analyzes and thoughtfully reflects on the significance of all accomplishments taken together, and can appropriately plan for future opportunities to impact student learning.

Overall, there is *clear* evidence of the teacher's ability to impact student learning through work with colleagues, professionals, families, and the community, and as a learner.

THE LEVEL 2 performance provides *limited* evidence of the teacher's ability to impact student learning through work with colleagues, professionals, families, and the community, and as a learner.

The Level 2 performance provides *limited* evidence:

- that the teacher treats parents and other interested adults as valued partners in the child's education, and uses appropriate strategies for reaching out to the families of his or her students. The rationale for the selected strategies may be a bit vague and/or there may be limited evidence that the strategies are effective in engaging parents and other interested adults. There may be evidence that, though the strategies work with many families, some families are not being fully engaged.
- that the communications with families are focused on substantive teaching and learning issues. Instead, many of the communications may be dominated by procedural issues, behavior, or disciplinary matters, or the communications may not show much differentiation between individual students, with the same communication going to all families.
- that the communications with families are interactive. There may be frequent communications home but these may rely primarily on one-way media, such as notes home or newsletters. The evidence may suggest that parents are well informed about what is going on in the classroom, but there is limited evidence of two-way dialogue with families.
- regarding meaningful communications between the students and the wider community for the purpose of enhancing teaching and learning.
- that the teacher has strengthened his or her own teaching practice through professional development; even if the teacher has engaged in extensive professional development activities, it may be unclear how these activities relate to the knowledge, skills, and abilities that are relevant to his or her teaching and learning context.
- that the teacher has shared what he or she has learned with colleagues by working with them in a role as a partner, collaborator, or leader.

The evidence in a Level 2 performance may indicate that the teacher is an accomplished practitioner within his or her own classroom, but that he or she has not shared his or her expertise with others in a significant way through professional development of other teachers, improving instructional practices, or advocating for positive change in educational policy.

The evidence may suggest that the preponderance of the teacher's activities outside of the classroom has been to fulfill job requirements, as opposed to being a conscious and deliberate effort to impact student learning and improve teaching and learning.

- that the teacher analyzes and reflects on the significance of all accomplishments taken together, and can appropriately plan for future opportunities to impact student learning.

The Level 2 performance may be characterized by evidence that occasionally hints at accomplished practice, but overall, there is *limited* evidence of the teacher's ability to impact student learning through work with colleagues, professionals, families, and the community, and as a learner.

THE LEVEL 1 performance provides *little or no* evidence of the teacher's ability to impact student learning through work with colleagues, professionals, families, and the community, and as a learner.

The Level 1 performance provides *little or no* evidence:

- that the teacher treats parents and other interested adults as partners in the child's education, and uses appropriate strategies for reaching out to the families of his or her students. The rationale for the selected strategies may be very vague, unclear, or absent.
- that the strategies are effective in engaging parents and other interested adults. There may be evidence that some families are overlooked or ignored.
- that the communications with families are focused on substantive teaching and learning issues. Instead, the communications are taken up almost exclusively by procedural issues, behavior, or disciplinary matters.
- that the communications with families are interactive. Communications with families are entirely one-way and/or infrequent. Parents may not be kept informed about what is going on in the classroom. If evidence regarding outreach to the wider community is present, the connections may promote trivial interactions with little impact on student learning.

The Level 1 performance may contain negative or disparaging comments about parents, community, or professionals with little or no evidence of the teacher's efforts to improve the situation.

- that the teacher has strengthened his or her own teaching practice through professional development. If professional development activities are cited, they may be very sketchy or weak or of little or no relevance to the teacher's context.
- that the teacher has worked with colleagues as a partner, collaborator, or leader. If school projects are cited, there may be little or no evidence of their impact on teaching and learning, or the teacher's role in the project may be very unclear or very passive.

There may be evidence that the teacher is an accomplished practitioner within his or her own classroom, but there is little or no evidence that he or she has shared his or her expertise with others.

The evidence may suggest that the teacher's work outside of the classroom has been carried out solely to fulfill job requirements, as opposed to being a conscious and deliberate effort to improve teaching and learning.

- that the teacher analyzes and reflects on the significance of all accomplishments taken together, and can appropriately plan for future opportunities to impact student learning.

Overall, there is *little or no* evidence of the teacher's ability to impact student learning through work with colleagues, professionals, families, and the community, and as a learner.

Scoring Rubrics for Assessment Center Exercises

Exercise 1: Data Analysis (Physics)

In this exercise: You demonstrate an ability to use sound principles of data analysis. You are asked to analyze, interpret, predict (extrapolate, interpolate), or infer using graphs or other data.

THE LEVEL 4 response shows *clear, consistent, and convincing* evidence that the candidate is able to demonstrate sound principles of data analysis, including a detailed discussion of the concept or process represented by the data, a correct interpretation using the data, and an accurate analysis of the data and a thorough justification of that analysis.

Characteristics:

- a detailed discussion of the concept or process represented by the data
- a correct interpretation of the significance of the slope and/or area
- an accurate use of the data to make a prediction and a thorough discussion of the manipulation of variables
- a correct representation of the graph as an equation

THE LEVEL 3 response shows *clear* evidence that the candidate is able to demonstrate sound principles of data analysis, including a detailed discussion of the concept or process represented by the data, a correct interpretation using the data, and an accurate analysis of the data and a thorough justification of that analysis.

Characteristics:

- a detailed discussion of the concept or process represented by the data, but may not be as thorough as a Level 4 response
- a correct interpretation of the significance of the slope and/or area
- an accurate use of the data to make a prediction and a thorough discussion of the manipulation of variables, but may not be as detailed as a Level 4 response
- a correct representation of the graph as an equation

THE LEVEL 2 response shows *limited* evidence that the candidate is able to demonstrate sound principles of data analysis, including a detailed discussion of the concept or process represented by the data, a correct interpretation using the data, and an accurate analysis of the data and a thorough justification of that analysis.

Characteristics:

- an unclear discussion of the concept or process represented by the data
- a partial interpretation of the significance of the slope and/or area
- an accurate use of the data to make a prediction and a sketchy discussion of the manipulation of variables
- a partial representation of the graph as an equation

THE LEVEL 1 response shows *little or no* evidence that the candidate is able to demonstrate sound principles of data analysis, including a detailed discussion of the concept or process represented by the data, a correct interpretation using the data, and an accurate analysis of the data and a thorough justification of that analysis.

Characteristics:

- an incorrect discussion of the concept or process represented by the data
- an incorrect interpretation of the significance of the slope and/or area
- an inaccurate use of the data to make a prediction and/or a misinformed discussion of the manipulation of variables
- an incorrect representation of the graph as an equation

Exercise 2: Interrelationships (Biology)

In this exercise: You show your knowledge of the interrelationships that exist within your discipline. You describe and analyze interrelationships.

THE LEVEL 4 response shows *clear, consistent, and convincing* evidence that the candidate can analyze interrelationships in biology and discuss how a change would affect the interrelationships.

Characteristics:

- an in-depth description of the interrelationships between two important concepts in biology
- a detailed explanation of two specific interrelationships appropriately related to the important concepts
- a thorough and accurate discussion of how a change would affect the interrelationships

THE LEVEL 3 response shows *clear* evidence that the candidate can analyze interrelationships in biology and discuss how a change would affect the interrelationships.

Characteristics:

- a detailed description of the interrelationships between two important concepts in biology, but may not be as in-depth as a Level 4 response
- a correct explanation of two specific interrelationships appropriately related to the important concepts, but may not be as detailed as a Level 4 response
- an accurate discussion of how a change would affect the interrelationships, but may not be as detailed as a Level 4 response

THE LEVEL 2 response shows *limited* evidence that the candidate can analyze interrelationships in biology and discuss how a change would affect the interrelationships.

Characteristics:

- a weak or sketchy description of the interrelationships between two important concepts in biology
- a general explanation of two specific interrelationships not as appropriately related to the important concepts
- a simplistic discussion of how a change would affect the interrelationships

THE LEVEL 1 response shows *little or no* evidence that the candidate can analyze interrelationships in biology and discuss how a change would affect the interrelationships.

Characteristics:

- an inaccurate description of the interrelationships between two important concepts in biology
- an incorrect explanation of two specific interrelationships and/or inappropriately related to the important concepts
- an inaccurate discussion of how a change would affect the interrelationships

Exercise 3: Fundamental Concepts (Earth/Space Science)

In this exercise: You demonstrate a depth of content knowledge in your specialized field. You are given a visual, mathematical, or graphical representation of a concept, and you give a description of the concept, analyze relationships, and discuss consequences of changes.

THE LEVEL 4 response shows *clear, consistent, and convincing* evidence that the candidate can identify a concept illustrated by a visual representation, provide an explanation, and analyze the effects of a change.

Characteristics:

- an accurate identification and detailed description of the concept illustrated by the visual representation
- an accurate and thorough explanation of the relationship between components in the visual representation
- an insightful analysis of the causes and effects of the stated change affecting the components in the visual representation

THE LEVEL 3 response shows *clear* evidence that the candidate can identify a concept illustrated by a visual representation, provide an explanation, and analyze the effects of a change.

Characteristics:

- an accurate identification and detailed description of the concept illustrated by the visual representation, but the discussion may not be as thorough as a Level 4 response
- an accurate explanation of the relationship between components in the visual representation
- an insightful analysis of the causes and effects of the stated change affecting the components in the visual representation, but the analysis may not be as complete as a Level 4 response

THE LEVEL 2 response shows *limited* evidence that the candidate can identify a concept illustrated by a visual representation, provide an explanation, and analyze the effects of a change.

Characteristics:

- an accurate identification with a weak description of the concept illustrated by the visual representation
- an accurate but skeletal explanation of the relationship between components in the visual representation
- a sketchy analysis of the causes and effects of the stated change affecting the components in the visual representation

THE LEVEL 1 response shows *little or no* evidence that the candidate can identify a concept illustrated by a visual representation, provide an explanation, and analyze the effects of a change.

Characteristics:

- an inaccurate identification and/or description of the concept illustrated by the visual representation
- an inaccurate explanation of the relationship between components in the visual representation
- an incorrect analysis of the causes and effects of the stated change affecting the components in the visual representation

Exercise 4: Changes in Systems (Chemistry Specialty Area Only)

In this exercise: You exhibit your knowledge of changes in chemical systems. You explain changes in chemical systems through a discussion of the underlying concepts or principles, a solution of a problem, and a discussion of the variables involved.

THE LEVEL 4 response shows *clear, consistent, and convincing* evidence that the candidate can describe a formula representing a system, solve a problem, and describe the role one variable would play in effecting a change to the system.

Characteristics:

- an accurate and in-depth description of a formula representing a system
- an appropriate and accurate solution of a problem using the formula
- a detailed description of the role one variable would play in effecting a change to the system

THE LEVEL 3 response shows *clear* evidence that the candidate can describe a formula representing a system, solve a problem, and describe the role one variable would play in effecting a change to the system.

Characteristics:

- an accurate and in-depth description of a formula representing a system, but it may not be as detailed as a Level 4 response
- an accurate solution of a problem using the formula
- a correct description of the role one variable would play in effecting a change to the system

THE LEVEL 2 response shows *limited* evidence that the candidate can describe a formula representing a system, solve a problem, and describe the role one variable would play in effecting a change to the system.

Characteristics:

- a skeletal description of a formula representing a system
- a solution of a problem using the formula, but the solution may be incorrect while the correct procedure was followed
- a weak description of the role one variable would play in effecting a change to the system

THE LEVEL 1 response shows *little or no* evidence that the candidate can describe a formula representing a system, solve a problem, and describe the role one variable would play in effecting a change to the system.

Characteristics:

- an inaccurate description of a formula representing a system
- an inappropriate and inaccurate solution of a problem using the formula
- an incorrect description of the role one variable would play in effecting a change to the system

Exercise 4: Change over Time (Biological, Physical, and Earth Sciences Specialty Areas)

In this exercise: You exhibit your knowledge of changes that occur over time in science. You explain changes that occur over time through a discussion of the underlying concepts or principles, a description of the mechanisms of change, and a discussion of the variables involved.

THE LEVEL 4 response shows *clear, consistent, and convincing* evidence that the candidate can describe and explain the mechanisms involved in a change over time.

Characteristics:

- an accurate and thorough in-depth description of the concept from biology
- a correct description of the mechanisms involved in changes over time involving the identified concept
- an accurate and thorough explanation, using an appropriate example, of how the concept illustrates a change over time

THE LEVEL 3 response shows *clear* evidence that the candidate can describe and explain the mechanisms involved in a change over time.

Characteristics:

- an accurate in-depth description of the concept, but may not be as thorough as in a Level 4 response
- a correct description of the mechanisms involved in changes over time involving the identified concept, but the mechanisms and descriptions may not be as extensive as in a Level 4 response
- an accurate explanation, using an appropriate example, of how the concept illustrates a change over time, but may not be as thorough as a Level 4 response

THE LEVEL 2 response shows *limited* evidence that the candidate can describe and explain the mechanisms involved in a change over time.

Characteristics:

- a simplistic or vague description of the concept
- a description of the mechanisms involved in changes over time involving the identified concept, but the mechanisms may be incomplete and/or the descriptions may be unclear
- an explanation, using an appropriate example, of how the concept illustrates a change over time, although the example may not be as appropriate and/or the explanation is not as informed

THE LEVEL 1 response shows *little or no* evidence that the candidate can describe and explain the mechanisms involved in a change over time.

Characteristics:

- an inaccurate description of the concept
- no description of the mechanisms involved in changes over time involving the identified concept, or the descriptions of the mechanisms are incomplete or inaccurate
- an explanation, using an inappropriate example, of how the concept illustrates a change over time and/or an inaccurate explanation

Exercise 5: Connections in Science (Chemistry)

In this exercise: You show your ability to relate science content in your area of specialization to another context of science. You describe a fundamental concept from your own specialty and relate the concept to other areas of science or to historical context, technology, or society.

THE LEVEL 4 response shows *clear, consistent, and convincing* evidence that the candidate can connect a topic studied in chemistry to another science and discuss the historical development of scientific thought concerning the concept.

Characteristics:

- a detailed explanation of a topic studied in chemistry
- a rich explanation of concepts from another science that are needed in order to understand the topic
- a thorough discussion of the historical development of scientific thought concerning the concept

THE LEVEL 3 response shows *clear* evidence that the candidate can connect a topic studied in chemistry to another science and discuss the historical development of scientific thought concerning the concept.

Characteristics:

- a detailed explanation of a topic studied in chemistry, but may not be as in-depth as a Level 4 response
- an accurate and appropriate explanation of concepts from another science that are needed in order to understand the topic, but may not be as detailed as a Level 4 response
- a thorough discussion of the historical development of scientific thought concerning the concept, but may not be as detailed as a Level 4 response

THE LEVEL 2 response shows *limited* evidence that the candidate can connect a topic studied in chemistry to another science and discuss the historical development of scientific thought concerning the concept.

Characteristics:

- a simplistic or weak explanation of a topic studied in chemistry
- an incomplete explanation of appropriate concepts from another science that are needed in order to understand the topic and/or concepts that are not as appropriate
- Discussion of the historical development of scientific thought concerning the concept may be weak or not appropriately related to the topic.

THE LEVEL 1 response shows *little or no* evidence that the candidate can connect a topic studied in chemistry to another science and discuss the historical development of scientific thought concerning the concept.

Characteristics:

- an inaccurate explanation of a topic studied in chemistry
- an inaccurate explanation of appropriate concepts from another science that are needed in order to understand the topic and/or concepts that are not appropriate
- Discussion of the historical development of scientific thought concerning the concept may be inaccurate or not related to the topic.

Exercise 5: Connections in Science (Earth/Space Science)

In this exercise: You show your ability to relate science content in your area of specialization to another context of science. You describe a fundamental concept from your own specialty and relate the concept to other areas of science or to historical context, technology, or society.

THE LEVEL 4 response shows *clear, consistent, and convincing* evidence that the candidate can connect a topic studied in Earth and space science to another science and discuss the topic in another context of science.

Characteristics:

- a detailed explanation of a topic studied in Earth and space science
- a rich explanation of the concepts from another science that are needed in order to understand the topic
- a thorough discussion of the topic in another context of science

THE LEVEL 3 response shows *clear* evidence that the candidate can connect a topic studied in Earth and space science to another science and discuss the topic in another context of science.

Characteristics:

- a detailed explanation of a topic studied in Earth and space science, but may not be as thorough as a Level 4 response
- an accurate and appropriate explanation of concepts from another science that are needed in order to understand the topic, but may not be as detailed as a Level 4 response
- a thorough discussion of the topic in another context of science, but may not be as detailed as a Level 4 response

THE LEVEL 2 response shows *limited* evidence that the candidate can connect a topic studied in Earth and space science to another science and discuss the topic in another context of science.

Characteristics:

- a simplistic or weak explanation of a topic studied in Earth and space science
- an incomplete explanation of appropriate concepts from another science that are needed in order to understand the topic and/or concepts that are not as appropriate
- Discussion of the topic in another context of science may be weak or not appropriately related to the topic.

THE LEVEL 1 response shows *little or no* evidence that the candidate can connect a topic studied in Earth and space science to another science and discuss the topic in another context of science.

Characteristics:

- an inaccurate explanation of a topic studied in Earth and space science
- an inaccurate explanation of appropriate concepts from another science that are needed in order to understand the topic and/or concepts that are not appropriate
- Discussion of the topic in another context of science may be inaccurate or not related to the topic.

Exercise 6: Breadth of Knowledge (Physics)

In this exercise: You demonstrate knowledge across the science disciplines. You describe a major idea in science. You then explain a concept in each of the three major sciences not in your specialty and relate the concepts to the major idea.

THE LEVEL 4 response shows *clear, consistent, and convincing* evidence that the candidate can describe a major idea, explain concepts from other fields of science, and relate the concepts to the major idea.

Characteristics:

- an accurate and thorough description of a major idea in science
- an accurate explanation and examples of one concept from biology, chemistry, and Earth and space science
- a thorough explanation of how each concept relates to the major idea

THE LEVEL 3 response shows *clear* evidence that the candidate can describe a major idea, explain concepts from other fields of science, and relate the concepts to the major idea.

Characteristics:

- an accurate description of a major idea in science, but may not be as thorough as a Level 4 response
- an accurate explanation and examples of one concept from biology, chemistry, and Earth and space science, but may be stronger in two of the sciences
- a thorough explanation of how each concept relates to the major idea, although the explanations may not be as insightful as a Level 4 response

THE LEVEL 2 response shows *limited* evidence that the candidate can describe a major idea, explain concepts from other fields of science, and relate the concepts to the major idea.

Characteristics:

- a limited description of a major idea in science
- an incomplete explanation or missing examples of one concept from biology, chemistry, and Earth and space science, although may be strong in one area
- a weak explanation of how each concept relates to the major idea, but may be stronger in one of the sciences

THE LEVEL 1 response shows *little or no* evidence that the candidate can describe a major idea, explain concepts from other fields of science, and relate the concepts to the major idea.

Characteristics:

- a limited or inaccurate description of a major idea in science
- an incomplete or inaccurate explanation or missing examples of two or more of the concepts from biology, chemistry, or Earth and space science
- little or no explanation of how each concept relates to the major idea

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