



Early Adolescence 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: Designing Science Instruction

In this entry: You demonstrate how you link instructional activities together to promote students' understanding of one important scientific concept along with the development of one or more related process goals. The students chosen should represent different kinds of challenges for you. You choose three instructional activities, related instructional materials, and two student responses to each activity, and submit a Written Commentary.

THE LEVEL 4 performance provides *clear, consistent, and convincing* evidence that the teacher is able to deepen students' understanding of an important science concept through an extended instructional sequence that connects the concept to relevant scientific process skills and technology.

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

- that the teacher is able to select and justify an important scientific concept and related learning goals that are appropriate for specific students and a specific teaching context.
- that the teacher selects one or more important process skills that are appropriate for his or her students to learn generally, and that also support their learning of the identified concept.
- that the teacher's instructional activities work together to further the stated learning goals in a logical sequence. The instructional sequence allows students to actively explore the important concept and related process skills, deepens their understanding of the concept and of the process skills, and places the concept within a broader context by establishing direct connections to students' prior knowledge and experience and other disciplines.
- that the instructional sequence reflects consideration of the unique learning needs of students, shows high expectations for students, and demonstrates mastery of the challenges of teaching this concept and sequence, including awareness of potential student misunderstandings and appropriate pedagogical responses.
- of the teacher's strong command of science content linked with appropriate science pedagogy.
- that the teacher is able to accurately describe, analyze, evaluate, and assess students' work, 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.
- that the teacher uses a variety of appropriate technologies to enhance student learning about science.
- that the teacher uses an integrated approach to assessment that furthers high and appropriate learning goals and enhances instruction.

- that the teacher’s use of assessment is appropriate, given the instructional context and the stated learning goals for the students.
- that the teacher employs a range of appropriate assessment practices, both formal and informal, gathers information about student progress from a variety of sources to understand student progress, and provides constructive feedback which influences subsequent instruction.
- 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 deepen students’ understanding of an important science concept through an extended instructional sequence that connects the concept to relevant scientific process skills and technology.

THE LEVEL 3 performance provides *clear* evidence that the teacher is able to deepen students' understanding of an important science concept through an extended instructional sequence that connects the concept to relevant scientific process skills and technology.

The Level 3 performance provides *clear* evidence:

- that the teacher is able to select and justify an important scientific concept and related learning goals that are appropriate for specific students and a specific teaching context.
- that the teacher selects one or more process skills that are appropriate for his or her students to learn generally, and that also support their learning of the identified concept. However, the connections may not be as clear or may not lead to as deep an understanding as in a Level 4 performance.
- that the teacher's instructional activities work together to further the stated learning goals in an appropriate sequence, though the sequencing may not flow as logically or be as clearly articulated as in a Level 4 performance. The instructional sequence allows students to explore the concept and related process skills, deepens their understanding of the concept and of the process skills, and places the concept within a broader context by establishing connections to students' prior knowledge and experience and other disciplines, though the connections may not be as strong as in a Level 4 performance.
- that the instructional sequence reflects consideration of the learning needs of students, though the level of differentiation between students may not be as great as in a Level 4 performance. The sequence evidences high expectations for students, and demonstrates an understanding of the challenges of teaching this concept and sequence, including awareness of potential student misunderstandings and appropriate pedagogical responses.
- of the teacher's 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 rich or detailed as in a Level 4 performance.
- that the teacher is able to adapt and/or create appropriate instructional resources to support student learning, though the resources may not be as rich as in a Level 4 performance.
- that the teacher uses a variety of appropriate technologies to enhance student learning about science.
- that the teacher uses an integrated approach to assessment that furthers appropriate learning goals and enhances instruction.
- that the teacher's use of assessment is appropriate, given the instructional context and the stated learning goals for the students, though the rationale may not be as strong or well articulated as in a Level 4 performance.

- that the teacher employs a range of appropriate assessment practices, both formal and informal, gathers information about student progress from a variety of sources to understand student progress, and provides constructive feedback which influences subsequent instruction. However, the types of assessment and the sources of evidence may not exhibit as wide a range as in a Level 4 performance. The results of assessment translate into constructive feedback to students and influence subsequent instruction, though the feedback may not be as detailed, copious, or instructive or the next steps may not be as well articulated as in a Level 4 performance.
- that the teacher is able to describe and analyze his or her practice accurately and reflect on its implications and significance for future teaching. However, the reflection may not be as detailed or as insightful as in a Level 4 performance.

The Level 3 performance may show imbalance in the different sources of evidence or in different parts of the analysis.

One part of the performance may be more indicative of accomplished practice than another, but overall, there is *clear* evidence that the teacher is able to deepen students' understanding of an important science concept through an extended instructional sequence that connects the concept to relevant scientific process skills and technology.

THE LEVEL 2 performance provides *limited* evidence that the teacher is able to deepen students' understanding of an important science concept through an extended instructional sequence that connects the concept to relevant scientific process skills and technology.

The Level 2 performance provides *limited* evidence:

- that the teacher is able to select an important scientific concept and learning goals that are appropriate for specific students and a specific teaching context. The selected concept and learning goals may be of limited significance or only loosely related to the instruction, or the justification for the concept may be weak in regard to student needs.
- that the teacher is able to select process skills that are appropriate for his or her students to learn generally. The selected process skill(s) may not be closely aligned with the concept or may be of limited application.
- that the teacher's instructional activities further the stated learning goals, but the logic of the sequence may not be clear. The instructional sequence allows students to explore the concept and related process skills, but the depth of the exploration may be limited. The instruction may not place the concept within a broader context.
- that the instructional sequence reflects consideration of the learning needs of students at a generalized level, without differentiation between students. There may be limited awareness of potential student misunderstandings or pedagogical responses may be restricted.
- of the teacher's command of science content and science pedagogy.
- that the teacher is able to describe, analyze, and evaluate students' work, though the analysis may show a limited understanding of the students' growth as science learners.
- that the teacher is able to adapt and/or create appropriate instructional resources.
- that the teacher is able to link technology to the teaching and learning of science, the links may be strained, or the use of technology may be limited.
- that the teacher uses an approach to assessment that furthers learning goals, but the use of assessment may not be fully integrated with instruction. The form and content of the assessments may be vague and only loosely connected to the instruction and the specific needs of the students.
- that the teacher employs a range of appropriate assessment practices, both formal and informal, gathers information about student progress from a variety of sources to understand student progress, and provides constructive feedback which influences subsequent instruction. However, the forms of assessment and the sources of evidence may be restricted.
- that the teacher is able to describe and analyze his or her practice, but the reflection may be vague, restricted, or focused solely on procedural aspects of teaching. The feedback may be appropriate in a general sense but not focused on individual students' accomplishments and needs.

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 deepen students' understanding of an important science concept through an extended instructional sequence that connects the concept to relevant scientific process skills and technology.

THE LEVEL 1 performance provides *little or no* evidence that the teacher is able to deepen students' understanding of an important science concept through an extended instructional sequence that connects the concept to relevant scientific process skills and technology.

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

- that the teacher is able to select or justify an important scientific concept and learning goals that are appropriate for specific students and a specific teaching context. The selected concept may be insignificant or inappropriate for these students. The learning goals may not be goals at all, but rather activities. When stated, the goals are vague, trivial, inappropriate, or not connected to the instruction.
- that the teacher is able to select process skills that are appropriate for his or her students to learn generally. The selected process skill(s) may be trivial or unrelated to the concept.
- that the teacher's instructional activities further the stated learning goals. The instructional sequence may be illogically constructed or the activities may be superficial and disjointed.
- that the instruction places the concept within a broader context.
- that the instructional sequence reflects consideration of the learning needs of students. The instruction may be "canned" and provided without regard to the specific teaching context. There is no differentiation between students. There is little or no awareness of potential student misunderstandings and pedagogical responses may be extremely restricted.
- of the teacher's command of science content and science pedagogy; the response may show signs of serious misunderstandings of content.
- that the teacher is able to describe, analyze, and evaluate students' work, and the analysis of student responses may consist solely of what each student got "right" and "wrong" or may focus on criteria outside the learning goals.
- that the teacher is able to adapt and/or create appropriate instructional resources; the activities and assignments may require students to simply recall information.
- that the teacher is able to link technology to the teaching and learning of science; technology may be treated in trivial or inappropriate ways.
- that the teacher uses an approach to assessment that furthers learning goals. The use of assessment is disconnected from the learning goals and instruction. The learning goals may not be goals at all, but rather activities, or may be extremely vague, trivial, or inappropriate, given student needs and abilities.
- that the teacher employs a range of appropriate assessment practices, both formal and informal, gathers information about student progress from a variety of sources to understand student progress, and provides constructive feedback which influences subsequent instruction. The forms of assessment and the sources of evidence may be restricted to a single type that offers students only one way to demonstrate understanding. The feedback may be minimal, absent, inappropriate, or incorrect.
- that the teacher is able to reflect on his or her practice. The reflection may be missing or unconnected to the instructional evidence.

Overall, there is *little or no* evidence of the teacher's ability to deepen students' understanding of an important science concept through an extended instructional sequence that connects the concept to relevant scientific process skills and technology.

Entry 2: Probing Student Understanding

In this entry: You submit a 20-minute video recording of a lesson in which you introduce an important concept in science, and demonstrate how you use classroom discourse and questioning to elicit students' initial conceptions of an important concept in science and how you use their understanding to influence your instruction. You also submit a Written Commentary that provides a context for the video-recorded discussion and describes, analyzes, and reflects on the discussion, student understanding, and your teaching.

THE LEVEL 4 performance provides *clear, consistent, and convincing* evidence that the teacher is able to use classroom discourse and questioning to elicit students' initial conceptions of an important idea in science and to use this understanding to guide instruction that deepens students' scientific understanding.

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

- that the teacher sets worthwhile and appropriate learning goals for his or her students in science and that these goals are connected to student needs and instruction.
- that the teacher is able to use the exploration of students' initial beliefs and understandings as a basis for discussion and that information yielded from this exploration informs further instruction.
- that the teacher is able to foster an equitable, accessible, and fair learning environment that promotes scientific discourse.
- of the teacher's skillful use of questions and probes to elicit students' conceptions and misconceptions, encourage student participation, and maintain focus on relevant ideas. There is a high level of engagement on the part of students, with active teacher-student and student-student exchanges that are characterized by scientific thinking.
- that the teacher is able to accurately describe, analyze, and evaluate classroom interactions, showing deep knowledge of his or her students and insight into their learning.
- that the teacher has a strong command of science content linked with appropriate science pedagogy.
- 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 use classroom discourse and questioning to elicit students' initial conceptions of an important idea in science and to use this understanding to guide instruction that deepens students' scientific understanding.

THE LEVEL 3 performance provides *clear* evidence that the teacher is able to use classroom discourse and questioning to elicit students' initial conceptions of an important idea in science and to use this understanding to guide instruction that deepens students' scientific understanding.

The Level 3 performance provides *clear* evidence:

- that the teacher sets appropriate learning goals for his or her students in science and that these goals are connected to student needs and instruction, though the connections may not be as strong as in a Level 4 performance.
- that the teacher is able to use the exploration of students' initial beliefs and understandings as a basis for discussion and that information yielded from this exploration informs further instruction.
- that the teacher is able to foster an equitable, accessible, and fair learning environment that promotes scientific discourse and encourages student participation, though the discussion may not maintain the same high level of focus as in a Level 4 performance.
- of the teacher's use of questions and probes to elicit students' conceptions and misconceptions, encourage student participation, and maintain focus on relevant ideas, though the questioning may not be as adept as in a Level 4 performance. Students are engaged in the discussion, and teacher-student and student-student exchanges are generally characterized by scientific thinking. However, opportunities to think through and exchange ideas may not be as frequent as in a Level 4 performance.
- that the teacher is able to accurately describe, analyze, and evaluate classroom interactions, showing knowledge of his or her students and insight into their learning, though the analysis may not be as detailed or insightful as in a Level 4 performance.
- that the teacher has a command of science content linked with appropriate science pedagogy.
- that the teacher is able to accurately describe and analyze his or her practice and reflect on its implications and significance for future teaching. However, the reflection may not be as detailed or insightful as in a Level 4 performance. A Level 3 performance may show imbalance in the different sources of evidence or in different parts of the analysis.

One part of the performance may be more indicative of accomplished practice than another, but viewed as a whole, there is *clear* evidence that the teacher is able to use classroom discourse and questioning to elicit students' initial conceptions of an important idea in science and to use this understanding to guide instruction that deepens students' scientific understanding.

THE LEVEL 2 performance provides *limited* evidence that the teacher is able to use classroom discourse and questioning to elicit students' initial conceptions of an important idea in science and to use this understanding to guide instruction that deepens students' scientific understanding.

The Level 2 performance provides *limited* evidence:

- that the teacher sets appropriate learning goals for his or her students in science. The goals for student learning may be vague, of limited significance, or only loosely related to the instruction.
- that the teacher is able to use the exploration of students' initial beliefs and understandings as a basis for discussion, but application of the information yielded from this exploration to further instruction may be limited.
- that the teacher is able to foster an equitable, accessible, and fair learning environment that promotes scientific discourse and encourages student participation. Though a discussion does take place, discourse on the video recording may be dominated by teacher-student interactions, with few student-student exchanges, and parts of the discussion may lack scientific focus. The level of challenge may be limited.
- of the teacher's use of questions and probes to elicit students' conceptions and misconceptions, encourage student participation, and maintain focus on relevant ideas. The questions and probes used by the teacher may not consistently elicit scientific reasoning on the part of students. Students may show limited engagement in the discussion. Opportunities to think through and exchange ideas are limited.
- that the teacher is able to describe, analyze, and evaluate classroom interactions. The analysis may be nonspecific and lacking insight into the interactions in the classroom, showing only limited evidence of knowledge of students.
- that the teacher has a command of science content and science pedagogy.
- that the teacher engages in reflective thinking about students or his or her instruction. The reflection may be global or focused only on procedural aspects of teaching and show limited understanding of the implications 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 use classroom discourse and questioning to elicit students' initial conceptions of an important idea in science and to use this understanding to guide instruction that deepens students' scientific understanding.

THE LEVEL 1 performance provides *little or no* evidence that the teacher is able to use classroom discourse and questioning to elicit students' initial conceptions of an important idea in science and to use this understanding to guide instruction that deepens students' scientific understanding.

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

- that the teacher sets appropriate learning goals for his or her students in science. The goals may not be goals at all, but rather activities, or goals may be vague, trivial, inappropriate or not connected to instruction.
- that the teacher is able to use the exploration of students' initial beliefs and understandings as a basis for discussion or to guide future instruction. If initial beliefs and understandings are sought, there may be evidence that this information is not used in subsequent instruction.
- that the teacher is able to foster an equitable, accessible, and fair learning environment that promotes scientific discourse and encourages student participation. Discourse on the video recording may be entirely dominated by teacher-student interactions, and the discussion may lack scientific focus. The questioning techniques employed by the teacher may be closed-ended or focused on a superficial aspect of the topic of interest. The discourse may be chiefly characterized by recall or "right-answer" questions. Students may show little or no engagement in the discussion. Opportunities to think through and exchange ideas may be completely absent. The interactions may reveal inappropriate, negative responses to students.
- that the teacher is able to describe, analyze, and evaluate classroom interactions. The analysis may be extremely vague, completely disconnected from the evidence on the video recording, or show no evidence of knowledge of students.
- that the teacher has a command of science content or science pedagogy; the response may show signs of serious misunderstandings of content.
- that the teacher engages in reflective thinking about students or his or her instruction. The reflection may be missing or unconnected from the instructional evidence and show little or no understanding of the implications for future teaching.

Overall, there is *little or no* evidence that the teacher is able to use classroom discourse and questioning to elicit students' initial conceptions of an important idea in science and to use this understanding to guide instruction that deepens students' scientific understanding.

Entry 3: Inquiry through Investigation

In this entry: You submit a 20-minute video recording of a lesson in which you conduct an investigation of an important scientific concept and demonstrate how you support students in a scientific inquiry discussion as they interpret data that have been collected during the course of the investigation. You also submit a Written Commentary that provides a context for the video-recorded discussion and describes, analyzes, and reflects on the discussion and students' development of inquiry skills.

THE LEVEL 4 performance provides *clear, consistent, and convincing* evidence that the teacher is able to use classroom discourse to facilitate students' engagement in scientific inquiry about data collected in an investigation of an important science concept.

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

- that the teacher sets worthwhile and appropriate learning goals for his or her students in science and that these goals are strongly connected to student needs and instruction.
- that the teacher is able to engage students in inquiry and meaningful discussion about data collected during an investigation of an important science concept.
- that the teacher is able to establish an equitable, accessible, fair, and supportive learning environment that promotes scientific discourse, encourages student participation, and maintains focus on relevant ideas.
- that the teacher is able to use skillful questions and probes to help students analyze and interpret data and extend their understanding of the underlying science concepts being investigated. There is a high level of engagement on the part of students, with active teacher-student and student-student exchanges that are characterized by scientific thinking, examination of competing explanations that are grounded in the data.
- that the teacher is able to accurately describe, analyze, and evaluate classroom interactions, showing deep knowledge of his or her students and insight into their learning.
- that the teacher has a strong command of scientific inquiry and science content linked with appropriate science pedagogy.
- 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 use classroom discourse to facilitate students' engagement in scientific inquiry about data collected in an investigation of an important science concept.

THE LEVEL 3 performance provides *clear* evidence that the teacher is able to use classroom discourse to facilitate students' engagement in scientific inquiry about data collected in an investigation of an important science concept.

The Level 3 performance provides *clear* evidence:

- that the teacher sets appropriate learning goals for his or her students in science and that these goals are connected to student needs and instruction, though the connections may not be as strong as in a Level 4 performance.
- that the teacher is able to engage students in inquiry and meaningful discussion about data collected during an investigation of an important science concept.
- that the teacher is able to establish an equitable, accessible, fair, and supportive learning environment that promotes scientific discourse, encourages student participation, though the discussion may not maintain the high level of focus as in a Level 4 performance.
- that the teacher is able to use questions and probes to help students analyze and interpret data, though the questioning may not be as adept as in a Level 4 performance. The investigation extends students' understanding of the underlying science concepts, but the connections between the data and the concepts may not be quite as strongly made as in a Level 4 performance. Students are engaged in the analysis and interpretation of data, and teacher-student and student-student exchanges that are generally characterized by scientific thinking.
- that the teacher is able to accurately describe, analyze, and evaluate classroom interactions, showing knowledge of his or her students and insight into their learning, though the analysis may not be as detailed or insightful as in a Level 4 performance.
- that the teacher has a command of scientific inquiry and science content linked with appropriate science pedagogy.
- that the teacher is able to accurately describe and analyze his or her practice and reflect on its implications and significance for future teaching. A Level 3 performance may show imbalance in the different sources of evidence or in different parts of the analysis.

One part of the performance may be more indicative of accomplished practice than another, but viewed as a whole, there is *clear* evidence that the teacher is able to use classroom discourse to facilitate students' engagement in scientific inquiry about data collected in an investigation of an important science concept.

THE LEVEL 2 performance provides *limited* evidence that the teacher is able to use classroom discourse to facilitate students' engagement in scientific inquiry about data collected in an investigation of an important science concept.

The Level 2 performance provides *limited* evidence:

- that the teacher sets appropriate learning goals for his or her students in science. The goals for student learning may be vague, of limited significance, or only loosely related to student needs or the instruction.
- that the teacher is able to engage students in inquiry and discussion about data collected during an investigation of a science concept, but the discussion may not make strong connections between the data and the concepts being investigated.
- that the teacher is able to establish an equitable, accessible, and fair learning environment that promotes scientific discourse and encourages student participation. Discourse on the video recording may be dominated by teacher-student interactions, with few student-student exchanges, and parts of the discussion may lack scientific focus. The level of challenge may be limited.
- of the teacher's use of questions and probes to help students analyze and interpret data, and the questions and probes may not consistently elicit scientific reasoning on the part of students. Students may show limited engagement in the discussion. Opportunities to think through and exchange ideas are limited.
- that the teacher is able to describe, analyze, and evaluate classroom interactions. The analysis may be nonspecific and lacking insight into the interactions in the classroom, showing only limited evidence of knowledge of students.
- that the teacher has a command of science content and science pedagogy.
- that the teacher engages in reflective thinking about students or his or her instruction. The reflection may be global or focused only on procedural aspects of teaching and show limited understanding of the implications 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 use classroom discourse to facilitate students' engagement in scientific inquiry about data collected in an investigation of an important science concept.

THE LEVEL 1 performance provides *little or no* evidence that the teacher is able to use classroom discourse to facilitate students' engagement in scientific inquiry about data collected in an investigation of an important science concept.

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

- that the teacher sets appropriate learning goals for his or her students in science. The goals may not be goals at all, but rather activities, or goals may be vague, trivial, inappropriate, or not connected to instruction.
- that the teacher is able to engage students in inquiry and discussion about data collected during an investigation of an important science concept. The discussion may not be about analyzing and interpreting data at all or there may be no connection between the data and the concepts that are supposed to be investigated.
- that the teacher is able to establish an equitable, accessible, and fair learning environment that promotes scientific discourse and encourages student participation. Discourse on the video recording may be entirely dominated by teacher-student interactions, and the discussion may lack scientific focus. The questioning techniques employed by the teacher may be closed-ended or focused on a superficial aspect of data analysis. The discourse may be chiefly characterized by recall or "right-answer" questions. Students may show little or no engagement in the discussion. Opportunities to think through and exchange ideas may be completely absent. The interactions may reveal inappropriate, negative responses to students.
- that the teacher is able to describe, analyze, and evaluate classroom interactions. The analysis may be extremely vague, completely disconnected from the evidence on the video recording, or show no evidence of knowledge of students.
- that the teacher has a command of science content or science pedagogy; the response may show signs of serious misunderstandings of content.
- that the teacher engages in reflective thinking about students or his or her instruction. The reflection may be missing or unconnected from the instructional evidence and show little or no understanding of the implications for future teaching.

Overall, there is *little or no* evidence that the teacher is able to use classroom discourse to facilitate students' engagement in scientific inquiry about data collected in an investigation of an important science concept.

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.
- 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

In this exercise: You demonstrate sound principles of data analysis. You read a student-designed experiment, study a student collection of data, and analyze a student conclusion concerning the experiment.

THE LEVEL 4 response shows *clear, consistent, and convincing* evidence that the candidate is able to evaluate a student-designed experiment, identify the components of the experiment, and analyze a student conclusion concerning the experiment.

Characteristics:

- an accurate identification of the components of the experiment
- an accurate identification and a thorough discussion of possible sources of error in the experimental design
- an accurate identification of the errors found in a student work sample
- an accurate identification and an informed discussion of errors in the correlation between the student hypothesis, conclusion, and the collected data
- an accurate discussion of the science content knowledge that is needed in order to understand the experiment

THE LEVEL 3 response shows *clear* evidence that the candidate is able to evaluate a student-designed experiment, identify the components of the experiment, and analyze a student conclusion concerning the experiment.

Characteristics:

- an accurate identification of the components of the experiment
- an accurate identification and a discussion of possible sources of error in the experimental design, although the discussion may not be as thorough as a Level 4 response
- an accurate identification of the errors found in a student work sample
- an accurate identification and a discussion of errors in the correlation between the student hypothesis, conclusion, and the collected data, but the discussion is not as informed as a Level 4 response
- an accurate discussion of the science content knowledge that is needed in order to understand an experiment, although the discussion may not be as detailed as in a Level 4 response

THE LEVEL 2 response shows *limited* evidence that the candidate is able to evaluate a student-designed experiment, identify the components of the experiment, and analyze a student conclusion concerning the experiment.

Characteristics:

- an incomplete identification of the components of the experiment
- an incomplete identification or a vague discussion of possible sources of error in the experimental design
- an incomplete identification of the errors found in a student work sample
- an accurate identification, but the discussion of errors in the correlation between the student hypothesis, conclusion, and the collected data may only be partially related to the student errors, or the identification of errors is incomplete or vague
- A discussion of the science content knowledge that is needed in order to understand the experiment is sketchy.

THE LEVEL 1 response shows *little or no* evidence that the candidate is able to evaluate a student-designed experiment, identify the components of an experiment, and analyze a student conclusion concerning the experiment.

Characteristics:

- an inaccurate or missing identification of the components of the experiment
- an inaccurate identification or incorrect discussion of possible sources of error in the experimental design
- an incomplete or inaccurate identification of the errors found in a student work sample
- an inaccurate identification of errors in the correlation between the student hypothesis, conclusion, and the collected data, and/or the discussion is not related to the errors
- A discussion of the science content knowledge that is needed in order to understand the experiment is inaccurate or incomplete.

Exercise 2: Interrelationships

In this exercise: You show your knowledge of interrelationships that exist within science. You give explanations of two concepts and explain the interrelationships.

THE LEVEL 4 response shows *clear, consistent, and convincing* evidence that the candidate can give explanations of two concepts and explain the interrelationships between them.

Characteristics:

- a detailed explanation of both scientific concepts
- an accurate and thorough explanation of the interrelationships that exist between the two concepts

THE LEVEL 3 response shows *clear* evidence that the candidate can give explanations of two concepts and explain the interrelationships between them.

Characteristics:

- an explanation of both scientific concepts, but may not have as much detail as a Level 4 response
- an accurate explanation of the interrelationships that exist between the two concepts, but the explanation may not be as thorough

THE LEVEL 2 response shows *limited* evidence that the candidate can give explanations of two concepts and explain the interrelationships between them.

Characteristics:

- a weak explanation of one or both scientific concepts
- a sketchy explanation of the interrelationships that exist between the two concepts

THE LEVEL 1 response shows *little or no* evidence that the candidate can give explanations of two concepts and explain the interrelationships between them.

Characteristics:

- an inaccurate or missing explanation of both scientific concepts
- an incorrect or missing explanation of the interrelationships that exist between the two concepts

Exercise 3: Unifying Concepts

In this exercise: You focus on your knowledge of unifying concepts. You describe a major idea in science, explain a concept from each of the major sciences, and relate the concepts to the major idea.

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

Characteristics:

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

THE LEVEL 3 response shows *clear* evidence that the candidate can explain concepts from each of the major sciences and can relate the concepts to a major idea.

Characteristics:

- an accurate and thorough description of a major idea in science but may not be as detailed as a Level 4 response
- an accurate explanation and examples of one concept from life science, Earth science, and physical science but may be stronger in two of the sciences
- a thorough explanation of how each concept relates to the major idea, although the explanation may not be as clear with one of the sciences

THE LEVEL 2 response shows *limited* evidence that the candidate can explain concepts from each of the major sciences and can relate the concepts to a major idea.

Characteristics:

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

THE LEVEL 1 response shows *little or no* evidence that the candidate can explain concepts from each of the major sciences and can relate the concepts to a 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 concepts from life science, Earth science, or physical science
- sketchy or incomplete explanation of how each concept relates to the major idea

Exercise 4: Change over Time

In this exercise: You demonstrate knowledge of change that occurs over time. You describe a concept from one of the major sciences and explain the mechanisms involved in a change over time involving that concept.

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, thorough, and in-depth description of a concept from one of the three major branches of science
- an appropriate explanation of the relationship of that concept to changes over time
- an accurate description of the mechanisms involved in changes over time involving that concept

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 description of a concept from one of the three major branches of science, but may not be as thorough or as in-depth as the Level 4 response
- an appropriate explanation of the relationship of that concept to changes over time, but the explanation may not be as extensive as a Level 4 response
- an accurate description of the mechanisms involved in changes over time involving that concept, although it may not be as thorough as the 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 description of a concept from one of the three major branches of science, but the description is simplistic or vague
- an explanation of the relationship of that concept to changes over time, but the mechanisms may be incomplete and/or the descriptions may be unclear
- a description of the mechanisms involved in changes over time involving that concept, although the mechanisms may not be as appropriate and/or the explanation is uninformed

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 explanation or an incorrect explanation of the relationship of that concept to changes over time
- no description or an inaccurate description of the mechanisms involved in changes over time involving that concept

Exercise 5: Student Misconceptions

In this exercise: You use your knowledge of science to identify student misconceptions and to appropriately address the misconceptions. You identify student misconceptions in a sample of student work, describe the scientific content needed to correct the misconceptions, and briefly explain how to pedagogically address the misconceptions.

THE LEVEL 4 response shows *clear, consistent, and convincing* evidence that the candidate can identify student misconceptions, describe the scientific content needed to correct the misconceptions, and explain how to pedagogically address the misconceptions.

Characteristics:

- an accurate identification of a student's misconceptions in the student's work
- an accurate description of the scientific concepts the student would need to understand in order to correct the misconceptions
- an informed description of the instruction to enhance student understanding and to address the student's misconceptions

THE LEVEL 3 response shows *clear* evidence that the candidate can identify student misconceptions, describe the scientific content needed to correct the misconceptions, and explain how to pedagogically address the misconceptions.

Characteristics:

- an accurate identification of a student's misconceptions in the student's work
- an accurate description of the scientific concepts the student would need to understand in order to correct the misconceptions, but the response may not be as detailed as a Level 4 response
- an informed description of the instruction to enhance student understanding and to address the student's misconceptions but may be more uneven than in the Level 4 response

THE LEVEL 2 response shows *limited* evidence that the candidate can identify student misconceptions, describe the scientific content needed to correct the misconceptions, and explain how to pedagogically address the misconceptions.

Characteristics:

- an incomplete or vague identification of a student's misconceptions in the student's work
- a limited or skeletal description of the scientific concepts the student would need to understand in order to correct the misconceptions
- Develops instruction to enhance student understanding and to address the student's misconceptions, but may be uneven and/or only vaguely related to student responses.

THE LEVEL 1 response shows *little or no* evidence that the candidate can identify student misconceptions, describe the scientific content needed to correct the misconceptions, and explain how to pedagogically address the misconceptions.

Characteristics:

- an inaccurate identification of a student's misconceptions in the student's work
- little or no evidence of an understanding of the scientific concepts the student would need to understand in order to correct the misconceptions
- Develops instruction to enhance student understanding and to address the student's misconceptions but parts may be missing or not related to the student responses.

Exercise 6: Science, Technology, and Society

In this exercise: You focus on your knowledge and understanding of science, technology, and society issues. You describe a science, technology, and society issue and discuss the scientific knowledge that students need to know in order to understand the issue.

THE LEVEL 4 response shows *clear, consistent, and convincing* evidence that the candidate can describe a science, technology, and society issue and discuss the scientific knowledge needed to understand the issue.

Characteristics:

- an accurate description of the combination of positive and negative consequences of a major event related to science
- an accurate and thorough explanation of how science and technology were involved in creating and/or solving a negative aspect of that important event
- a thorough and insightful discussion of the scientific knowledge necessary to understand the science, technology, and society aspect of the event

THE LEVEL 3 response shows *clear* evidence that the candidate can describe a science, technology, and society issue and discuss the scientific knowledge needed to understand the issue.

Characteristics:

- an accurate description of the combination of positive and negative consequences of a major event related to science
- an accurate explanation of how science and technology were involved in creating and/or solving a negative aspect of that important event, but the explanation may not be as thorough as the Level 4 response
- an accurate discussion of the scientific knowledge necessary to understand the science, technology, and society aspect of the event, but the explanation may not be as insightful as the Level 4 response

THE LEVEL 2 response shows *limited* evidence that the candidate can describe a science, technology, and society issue and discuss the scientific knowledge needed to understand the issue.

Characteristics:

- a sketchy description of the combination of positive and negative consequences of a major event related to science
- a confusing explanation of how science and technology were involved in creating and/or solving a negative aspect of that important event
- a weak discussion of the scientific knowledge necessary to understand the science, technology, and society aspect of the event

THE LEVEL 1 response shows *little or no* evidence that the candidate can describe a science, technology, and society issue and discuss the scientific knowledge needed to understand the issue.

Characteristics:

- an inaccurate or incomplete description of the combination of positive and negative consequences of a major event related to science
- an incorrect or incomplete explanation of how science and technology were involved in creating and/or solving a negative aspect of that important event
- an inaccurate or uninformed discussion of the scientific knowledge necessary to understand the science, technology, and society aspect of the event

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