



Implementing High-Quality Performance Assessments in Science

Participant Workbook

Regional Educational Laboratory Appalachia at SRI International

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Introduction and Background

The purpose of this workbook is to provide support to teachers using the Virginia Quality Criteria Review Tool for Performance Assessments (see box 1). This workbook and related workshop are part of a set of coaching activities developed for the Implementing High-Quality Performance Assessments in Science project, supported by Regional Educational Laboratory Appalachia (REL AP). This project was developed to support Virginia educators' use of evidence-based practices related to performance assessments. The project's objectives are to support teachers to:

- Apply the Quality Criteria Tool to identify a performance assessment that meets the quality standards in the Quality Criteria Tool.
- Enhance and revise performance assessments so that they meet the quality standards in the Quality Criteria Tool.

The focus of the project and workbook is on science assessments; however, teachers working in other content areas may also find the materials useful.

Box 1. The Virginia Quality Criteria Review Tool for Performance Assessments

In January 2019 the Virginia Board of Education updated its guidelines for Local Alternative Assessments, emphasizing use of the Virginia Quality Criteria Review Tool for Performance Assessments (known as the Quality Criteria Tool in this document) to establish consistent expectations for educators in using performance assessments. A full copy of the Quality Criteria Tool is included as Appendix A.

Defining Performance Assessments

Performance assessments are assessments that require students to craft their own responses to problems by constructing an answer, producing a product, or performing an activity (Parsi & Darling-Hammond, 2015). Performance assessments may be used for formative, interim, or summative purposes. They can range from informal applications, such as biweekly journal entries, to formal applications, including performance tasks as part of a statewide summative assessment (box 2 describes the difference between performance task and performance assessment).

Performance assessments require students to apply complex knowledge and skills to construct an answer, produce a product, or perform an activity (McTighe, 2014; Parsi & Darling-Hammond, 2015). They may also include instructional strategies that support a deeper, more thorough understanding of content and proficiency in applying content practices (Chun, 2010; National Research Council, 2011). Performance assessments may be embedded in larger curricular units and are typically administered over time to provide educators with both formative and summative feedback.

Box 2. Task or Assessment?

Although the terms are often used interchangeably, in this workbook a performance task refers to the individual activities or pieces of work students complete as part of a performance assessment. The performance assessment refers to the entire assessment, including the student and teacher instructions, activities, scoring rubric, and other materials.

Step-by-Step Process for Identifying and Using Performance Assessments

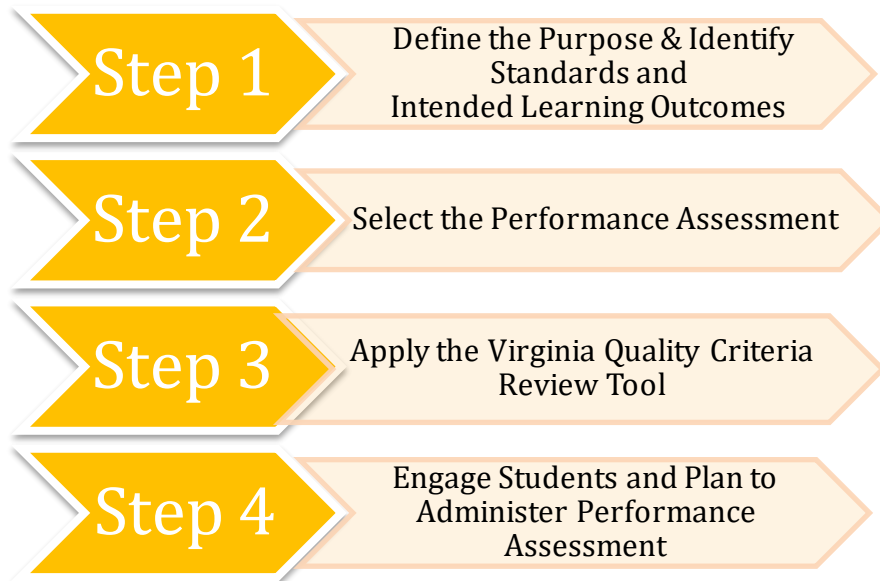
To facilitate the identification and use of performance assessments, this workbook outlines a four-step process (figure 1). These steps are:

- Step 1: Define the Purpose & Identify Standards and Intended Learning Outcomes
- Step 2: Select the Performance Assessment
- Step 3: Apply the Virginia Quality Criteria Review Tool
- Step 4: Engage Students and Plan to Administer Performance Assessment

These steps include tasks that teachers frequently undertake as they plan lessons and assessments, but do not always articulate. In step 1, teachers first define the purpose of the assessment and consider the standards and intended learning outcomes they want to measure. Step 2 involves selecting a performance assessment that meets the purpose and standards identified in step 1. We include key points to consider when selecting an assessment and searching through performance assessments available online or through school district repositories. Many teachers may already engage in these first two steps as a natural part of their planning process. Our experience suggests it is helpful to be intentional about determining and documenting the purpose of the performance assessment early in the planning process. This type of pre-work can help both new and experienced teachers organize their thinking and assist with implementing a high-quality performance assessment.

Step 3 of the process focuses on applying the Quality Criteria Review Tool and provides information on how to use the tool to assess and enhance performance assessments to ensure they are aligned with instructional goals. Step 4 discusses the importance of engaging students in the performance assessment process and how to plan to administer the assessment. Step 4 also provides tips and tools teachers can utilize when planning to administer a performance assessment and discusses rubrics as a central aspect of a high-quality performance assessment.

Figure 1. Step-by-step process for identifying and using performance assessments



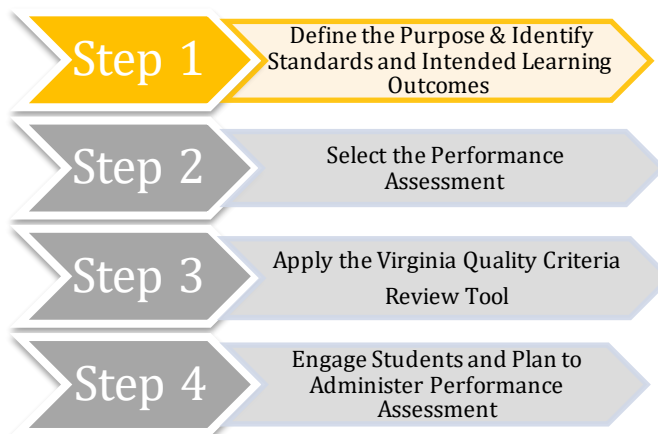
Step 1: Define the Purpose and Identify Standards and Intended Learning Outcomes

Step 1 of Identifying and Using Performance Assessments addresses the following questions:

- Who is being assessed?
- Why do I need to assess students at this time?
- What is being assessed?

The first step in the assessment

process helps you to determine what purpose the assessment will serve. This includes identifying the student population to be assessed and the content knowledge and skills students will be expected to master and/or demonstrate (McTighe & Wiggins, 2012).



Identifying the population

As a part of identifying an assessment's purpose, it is important to define the population the assessment is designed to evaluate. Population, in the context of this work, refers to the intended grade levels or targeted student groups that will be assessed. The population you identify should align with the specified content standards and learning outcomes for the grade level being assessed. The population can include a single grade level or a span of grades if the assessment is relevant for multiple grades. For example, populations to be assessed could be:

- Grade 1
- Grades 9–12
- Students in an AP biology course

Identifying the purpose

You may need to use an assessment for a variety of reasons. For example, teachers may need a way to assess student understanding at the midpoint of a unit, or they may need to assess learning across the entire span of a course. By first establishing the assessment's purpose, or the intended objective for the particular assessment, the teacher can make subsequent assessment design decisions to maximize the assessment's effectiveness. If a teacher does not clearly define the purpose of an assessment before designing it, the resulting assessment may not serve the purpose originally imagined. It is also possible that if the assessment's purpose is not clearly articulated, a more appropriate assessment approach may be overlooked.

Types of assessments

You may be familiar with a variety of terms describing different types of assessment and how their scope and administration frequency differ by type. Figure 2 illustrates three primary assessment types.

Figure 2. Types of assessments by frequency of administration and scope and duration of cycle

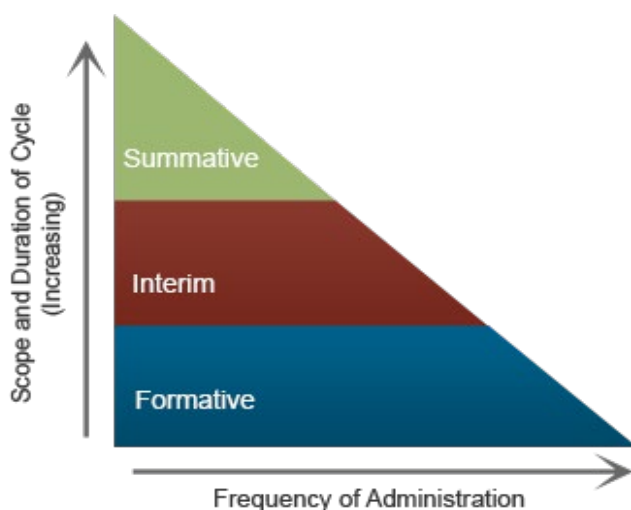


Figure as originally presented by Perie, M., Marion, S., & Gong, B. (2009). Moving toward a comprehensive assessment system: A framework for considering interim assessments. *Educational Measurement: Issues and Practice*, 28(3), 5-13.

Formative assessments allow teachers and students to gather information during, rather than after, the learning process. Formative assessments are administered frequently and reflect a short duration of content; that is, their scope is quite narrow. They are designed to provide regular feedback to teachers so they can adjust instruction to

improve student learning. For example, at the end of a class period focused on plate tectonics, a middle school science teacher may do a “3-2-1 check for understanding” by asking students to write down three things they learned, two interesting things, and one remaining question.

Interim assessments are administered during instruction and are designed to evaluate students’ knowledge and skills relative to a specific set of goals so that teachers can identify strengths and weaknesses in curriculum and instruction. They are administered less frequently than formative assessments and reflect a broader scope of content. For example, for a unit on the interaction of Earth’s major systems, a teacher may ask students to construct an explanation for how ice changes the surface of a mountain. Conducting this interim assessment will help the teacher assess students’ knowledge, prepare them to move on, or determine whether certain content should be revisited.

Summative assessments are formal assessments used to measure overall curriculum and program effectiveness. They are administered less frequently than formative and interim assessments, yet their scope reflects a broad range of content. These assessments are often standardized to allow comparisons across groups. For example, after completing a unit on the stars and the solar system, an elementary science teacher might ask students to create a model that explains why the night sky appears different at various times during the year. This assessment would require students to use everything they have learned about the position and motion of Earth in relation to the sun and stars and serve as the final check that students have gained all knowledge and skills taught in the full unit.

Box 3. Performance Assessment

A performance assessment can include components of each assessment type.

When considering an assessment's purpose, a teacher should ask the following questions:

Does the assessment...

- Provide evidence of student comprehension that will inform subsequent teaching?
- Provide students with feedback on their progress toward learning targets?
- Allow students to conduct a self-assessment or peer assessment (see box 4) of their current understanding?
- Inform students or their parents/guardians about the students' current level of achievement during a given period?
- Help in making decisions about students who need additional learning support?

Box 4. Self-Assessment and Peer Assessment

Teachers typically use self and peer assessments as formative tools to assess progress and increase student engagement. Self-assessment involves students reflecting on their own work. It can involve them judging their performance using a set of assessment criteria, such as a rubric, or reflecting on their work by writing in a journal. The process emphasizes the opportunity for students to identify high-quality work, rather than simply providing a grade.

Peer assessment involves students assessing the work of their peers against a set of assessment criteria. They can provide feedback to their peers as well as a score or grade.

These practices allow students to take ownership of the assessment process, which not only allows students to better understand the assessment criteria, but can also increase their motivation and engagement. More information on engaging students with peer or self assessments is included under Step 4.



PRACTICE IT: Performance assessment purpose

Think about the assessment opportunity you have identified in your classroom where you will utilize a performance assessment. Use this space to document the population, purpose, and type of assessment you plan to implement.

1. What is the population you wish to assess?

2. What is the purpose of this assessment?

3. What type(s) of assessment (formative, interim, summative) would be most useful?

Identifying the intended learning outcomes to assess

In this section we will focus on the questions:

- What learning outcomes will I measure through this assessment?
- How do I know if my assessment really measures the learning outcomes I define?

Once teachers have identified who and what (i.e., the general topic) they will be assessing, they should then narrow the focus to the specific content standards for the course or content area to be assessed. Teachers can then begin to identify learning outcomes, or the evidence related to the content standards that may be measured through assessment. Learning outcomes (box 5) are sometimes also referred to as performance outcomes or learning expectations. Whatever the terminology, the idea is to have clear statements of what we expect students to learn and be able to do that can be demonstrated and measured via the assessment.

Box 5. Learning Outcomes

Learning outcomes are clear statements of what students are to learn, lesson by lesson or in overall units. They provide direction for both instruction and assessment. They may be derived from nationally recognized content standards, such as the Next Generation Science Standards, or from state standards for a content area.

The Next Generation Science Standards and other up-to-date state standards are unique in that they include both scientific practices and science concepts. Because standards often include both practices and concepts that could be covered in the same lessons or performance assessments, it is important that you unpack the standard(s) and learning outcome(s) you intend to assess. In this way, you will be able to ensure your assessment tasks are measuring the exact content and skills you intend to measure.



TOOLS FOR USE: Analyzing standards

If you need assistance in unpacking the standards and learning outcomes you want to assess, you may find the resource below helpful (figure 3). WestEd's Tool for Analyzing Standards (Perks et al., 2015) is useful for breaking down a standard into knowledge and concepts students should know and what needs to be taught, and what students should be able to do and what skills need to be taught and practiced. The tool includes space for implications for instruction and assessment. Using this tool can aid in the process of ensuring that the performance assessment is developmentally appropriate for target students and aligned with the grade-level scope and sequence or curriculum.

Figure 3. Tool for analyzing standards

Tool for Analyzing Standards

Focus Standard: *Write the complete standard that is the focus of the lesson in this box. Typically, there will only be one standard that is the focus of a lesson. It is acceptable practice to strike through parts of a standard that are not being focused on in the lesson.*

KNOWLEDGE AND CONCEPTS (NOUNS)

Identify and list what this standard states and implies about what students should know and what knowledge needs to be taught.

Begin by looking at and analyzing the nouns. If the standard implies specific knowledge (e.g. knowledge of figurative language) then decide what specific knowledge needs to be taught (e.g. metaphors, simile, and foreshadowing).

SKILLS AND PROCESSES (VERBS)

Identify and list what this standard states and implies about what students should be able to do and what skills needs to be taught and practiced.

Begin by looking at and analyzing the verbs. If the standard states or implies the ability to engage in a procedure, then identify the specific steps of the procedure.

IMPLICATIONS FOR INSTRUCTION

Make a list of strategies, tools, and/or resources that could be used to teach the knowledge and skills unpacked and defined above.

Identify what knowledge and skills should have already been learned and those that need to be explicitly taught.

IMPLICATIONS FOR ASSESSMENT

Make a list of strategies, tools, and/or resources that could be used to assess the knowledge and skills unpacked and defined above.



PRACTICE IT: Tools for analyzing standards

Use this space to think about the knowledge and concepts students should know and what will be taught, and the implications for teaching and assessing.

<i>Tool for Analyzing Standards</i>	
Focus Standard:	
Knowledge and Concepts (nouns):	Skills and Process (verbs):
What knowledge should students already have?	What skills should students already have?
Implications for Instruction (ideas for teaching)	
Implications for Assessment (Ideas for assessing)	

Once you have unpacked the standards and learning outcome, you have all the information you need to identify a performance assessment. If you're using the Next Generation Science Standards, going through the systematic process of unpacking the three dimensions to understand and prioritize the components of the practices, disciplinary core ideas, and crosscutting concepts embedded in the learning outcome is part of the first step in identifying and using high-quality performance assessments.



PRACTICE IT: Performance assessment standards and intended learning outcomes

Think about the same assessment opportunity you worked on above. Then, list the standards that you intend to measure. Next, specify the associated learning outcomes.

<i>Standard:</i>	<i>Learning Outcome:</i>



TOOLS FOR USE: Assessment blueprint

Below is an example of an Assessment Blueprint, a helpful tool for clearly indicating which performance task is associated with which learning outcomes and which content standards. Blueprints often also include space for further articulated learning outcomes called indicators, which identify the level of complexity of a task and the weight associated with each task for scoring purposes (e.g., 50%). A template for creating an Assessment Blueprint can be found in appendix D.

Table 1. Example assessment blueprint

<i>Content Standards</i>	<i>Learning Outcomes</i>	<i>Indicators</i>	<i>Aligned Tasks</i>	<i>Level of Complexity</i>	<i>Weight</i>
Example 1					
Organisms and environments. The student knows all organisms are classified into groups sharing similar characteristics that allow them to interact with the living and non-living parts of their ecosystem. Students recognize the broad classification categories of common animals.	Students correctly classify common organisms as mammal, bird, fish, reptile, or amphibian.	Students are able to identify the characteristics that differentiate an organism into one of the classifications.	Students draw and label an imaginary creature from outer space and describe what it looks like and which features, including life cycle, it has that relegate it to one of the classifications.	Application	50%

<i>Content Standards</i>	<i>Learning Outcomes</i>	<i>Indicators</i>	<i>Aligned Tasks</i>	<i>Level of Complexity</i>	<i>Weight</i>
Example 2					
Organisms and environments. The student knows that different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.	Students describe and evaluate the relationship between environment and adaptive features.	Students are able to imagine a reasonable adaptation that an organism would make to an invented environment.	Students draw and label important environmental features (available liquids, gases, temperature, etc.) and explain how their invented organism has adapted to thrive in that environment.	Application	50%

Box 6. Content Standards

Descriptions of what students should know and be able to do in a specific content area.

Box 7. Learning Outcomes

Refer to the academic knowledge, behaviors, and skills students are expected to learn and demonstrate in a performance task.

Box 8. Indicators

Refer to the observable or measurable characteristics of the learning outcome.

Aligning learning outcomes and assessments

When teachers think about learning outcomes as they relate to assessment, they must consider the extent to which they have taught to the learning outcomes and the extent to which their assessments actually measure the learning outcomes. In short, to ensure the proper use of the assessment and make the most out of the assessment results, there must be alignment between the knowledge, skills, and abilities individual students are expected to demonstrate; what the assessment is intended to measure; and what the assessment actually measures.

An easy way to understand the purpose of alignment is with an analogy. Consider a car mechanic's job in aligning a vehicle. The purpose of wheel alignment is to ensure that the car travels straight and true without pulling to one side or the other. When teachers align an assessment, they ensure that the assessment fully measures all the learning outcomes they intend to measure and not additional content that may be relevant to the course but does not relate to the learning outcomes they have defined.

Aligning the assessment to learning outcomes means teachers make sure an assessment addresses the specified learning outcomes and does not address other content. It also means ensuring the assessment does not address only some of the specified learning outcomes and not others, or “pulls to one side,” like a car that is not aligned.

Why alignment matters

When content standards, learning outcomes, curriculum and instruction, and classroom assessment practices are aligned, the assessment will provide more accurate information about students' strengths and areas for growth. Another word for accuracy is “validity.” Traditionally, when assessment experts discuss validity, they mean the extent to which a test measures what it claims to measure. We can think about validity as the alignment of learning outcomes, curriculum and instruction, assessment

Box 9. Alignment Example

If a science teacher wanted to create an assessment to measure students' ability to develop a model describing the cycling of carbon through the living and non-living parts of an ecosystem, the assessment (through the range of specific assessment tasks the teacher designs) would require demonstration of the knowledge and skills from the Science Standards of Learning (SOLs).

If the resulting assessment required students to label a diagram of the carbon system (a disciplinary core idea in the Performance Expectation), but did not provide a way for the students to develop their own model describing this process (the practice dimension), the assessment would not align completely with the full intent of the Performance Expectation.

It is important to note that not all assessment tasks employed during instruction will address all aspects of a Performance Expectation. Rather, it may require several related assessment tasks to fully measure a Performance Expectation.

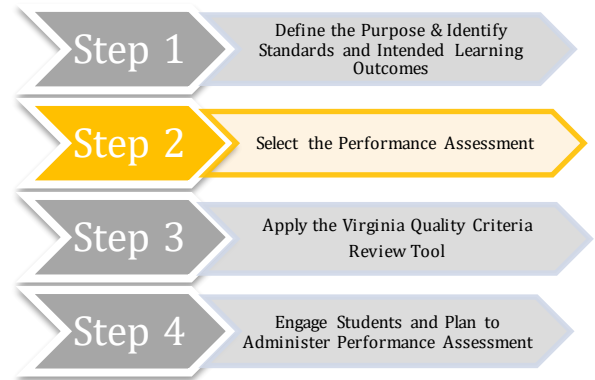
design, analysis of responses, and the decisions that derive from this analysis. Using a well-aligned, valid, and accurate assessment will better inform your instruction based on the assessment results and let students understand their own learning strengths and needs.

When thinking about the alignment of your own assessment, consider these questions:

- Are there clear connections between the learning outcomes I identified and the tasks I am using in my assessment?
- Have I identified which components of the learning outcome(s) have the highest priority or are the most relevant? Are there any additional aspects of the learning outcome(s) that are being assessed that I have not clearly identified?
- Does the assessment provide an appropriate number of items or tasks to assess the various knowledge and skills that I need students to demonstrate? Is there anything important that I need to see that students won't be able to demonstrate with the task(s)?

Step 2: Select the Performance Assessment

Once an educator has defined the purpose, identified the student population, and articulated the standards and intended learning outcomes, the next step is to find a suitable performance assessment for students to demonstrate the knowledge and skills identified in step 1. The key is to determine the quality and relevance of a performance assessment before investing significant amounts of time and effort tailoring the content. The checklist below can be used to determine whether a performance assessment has all elements necessary to measure it against the Quality Criteria Tool, or whether looking for a better performance assessment is the appropriate next step.





TOOLS FOR USE: Performance assessment checklist

This checklist is designed to help teachers identify whether a performance assessment could be a worthwhile example to consider before undertaking a thorough review with the Quality Criteria Tool. The content of the checklist reflects the seven sections found in the Quality Criteria Tool. We recommend moving forward with an assessment only if it meets **five or more** of the criteria. If your identified assessment does not, it will likely be difficult to meet the standards of quality that the Quality Criteria Tool supports, and you may want to continue searching for a more suitable performance assessment example.

Table 2. Performance assessment checklist

Performance Assessment Checklist		
	YES	NO
The task aligns to the standards and intended learning outcomes that you intend to assess	<input type="checkbox"/>	<input type="checkbox"/>
The topic is relevant to students' reality/experience, and tasks are authentic to the discipline.	<input type="checkbox"/>	<input type="checkbox"/>
Multiple pathways for students to express their knowledge and communicate reasoning are present.	<input type="checkbox"/>	<input type="checkbox"/>
The rubric or scoring tool is included.	<input type="checkbox"/>	<input type="checkbox"/>
The performance assessment is designed to include all students with differentiated ways to demonstrate knowledge.	<input type="checkbox"/>	<input type="checkbox"/>
Resources and materials are realistic and easily accessible.	<input type="checkbox"/>	<input type="checkbox"/>



FOCUS

If your identified assessment does not meet the first criterion, you will want to consider whether you will be able to adjust the task to align with the standards and intended learning outcomes you intend to assess or add an additional task or tasks to improve alignment. If making either of these adjustments seems too time-consuming, then it may be better to find another assessment that more closely assesses the standards and intended learning outcomes you identified in step 1. If you do need to add additional tasks, you will want to do that before moving to step 3. Step 3 should be undertaken only when all of the tasks are included, even if the performance assessment is not yet of high quality.

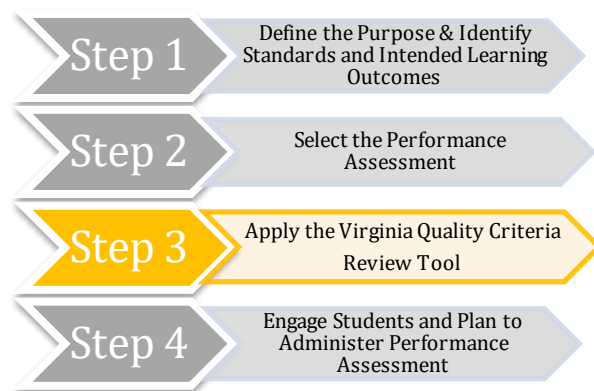
Box 10. Where to Find Performance Assessments?

- School division website
- Teacher lesson plan websites
- Colleagues
- Social media (e.g., Pinterest)
- Science instructional coaches
- Stanford SCALE repository <http://performanceassessmentresourcebank.org/>

It is unlikely you will find a perfect performance assessment you can use without revisions. Rather, you may find one that will be a good starting place and meet your needs after you make some revisions.

Step 3: Apply the Virginia Quality Criteria Review Tool

This step involves applying the Quality Criteria Tool (appendix A) to your selected performance assessment. Going through this process will not only ensure your performance assessment is of high quality, it will also assist you in improving the quality of your assessment as you revise the assessment components to meet the criteria.



Most existing performance assessments will require some revisions to fully meet the quality criteria specified in the Quality Criteria Tool. You may find it useful to revise your assessment several times to meet the criterion before evaluating your assessment against another criterion. However, it is possible that to meet a later criterion, you will need to make changes that also relate to another criterion. Thus, the process of evaluating and refining the assessment is quite iterative.

Below is an annotated example from a simple machines performance assessment, which is a Virginia Department of Education exemplar. For each criterion, we highlight strategies for how to meet the criterion with full evidence. This exemplar is included in its entirety in appendix B.



PRACTICE IT: Applying the Quality Criteria Tool to an existing performance assessment

You can practice using the Quality Criteria Tool on this exemplar by assigning a rating and providing evidence in each of the following sections. This activity should help you get familiar with the tool. The complete performance assessment for this simple machines example can be found in appendix B. We outline several pieces of evidence that might be used for the criteria, but you should supplement some of the evidence we provide with your own.

Criteria indicators: Simple machines performance assessment example

Criterion 1: Standards/intended learning outcomes

Criterion 1A. Virginia Standards of Learning selected for the performance assessment are clearly listed in a task template, developmentally appropriate for target students, and aligned to the grade-level scope and sequence or grade-level curriculum. Performance assessment components, resources/materials, and student products are aligned to the listed SOLs.

Rating

- | | |
|---|---|
| <input type="checkbox"/> 0-No Evidence | <input type="checkbox"/> 2-Partial Evidence |
| <input type="checkbox"/> 1-Limited Evidence | <input type="checkbox"/> 3-Full Evidence |

Evidence

Criterion 1B. The performance assessment goes beyond simple recall, elicits evidence of complex student thinking, and requires application of disciplinary or cross-disciplinary concepts, practices, and/or transferable skills, such as application, analysis, evaluation, synthesis, or original creation.

Rating

☐ 0-No Evidence

☐ 2-Partial Evidence

☐ 1-Limited Evidence

☐ 3-Full Evidence

Evidence

Criterion 1C. The performance assessment provides an opportunity for students to develop and demonstrate (even if not explicitly assessed):

- Deeper learning competencies, defined as mastering rigorous academic content.
- Learning how to think critically and solve problems.
- Working collaboratively.
- Communicating effectively.
- Directing one's own learning.
- Developing an academic mindset.

The performance assessment may also provide opportunities for students to develop and demonstrate:

- Life-Ready competencies defined by the Profile of a Virginia Graduate as content knowledge, career planning, workplace skills, and community and civic responsibility.
- Technology-related competencies.
- Integration of intended learning outcomes from two or more subjects.

Rating

☐ 0-No Evidence

☐ 2-Partial Evidence

☐ 1-Limited Evidence

☐ 3-Full Evidence

Evidence

Example of Criterion 1 – Standards/intended learning outcomes

(1) Standards and learning outcomes are listed for all content areas being assessed.

Content Standards:

Science (2018)

- 3.2 The student will investigate and understand that the direction and size of force affects the motion of an object. Key ideas include
- a) simple machines increase or change the direction of a force; and
 - b) simple and compound machines have many applications.

English

- 3.8 The student will write in a variety of forms to include narrative, descriptive, opinion, and expository.
- e) Write a clear topic sentence focusing on main idea.
 - f) Elaborate writing by including supporting details.
 - i) Write a well-developed paragraph focusing on the main idea.
 - j) Revise writing for clarity of content using specific vocabulary and information.

Computer Science

- 3.6 The student will break down (decompose) a larger problem into smaller sub-problems, independently or collaboratively.

Criterion 2: Authenticity

Criterion 2. The performance assessment is authentic along the dimensions:

- The performance assessment's topic, context (scenario), materials/resources, products, and purpose/audience (i.e., what students are asked to do and for whom) are relevant to the real world, students' community, students' interests, future careers, or other meaningful context. The performance assessment asks students to do work authentic to the discipline (i.e., what adult practitioners of the discipline do), such as: science inquiry; math problem-solving; analyzing and critiquing a text; analyzing and evaluating historical sources.

Rating

☐ 0-No Evidence

☐ 2-Partial Evidence

☐ 1-Limited Evidence

☐ 3-Full Evidence

Evidence

Example of Criterion 2 – Authenticity

Performance Task:

Scenario:
Your aunt built a treehouse in your backyard that is 2 meters off the ground. Your aunt has provided you a ladder to access the treehouse and she has made a rule that you must use both hands to go up and down the ladder. You and your friends want to have a party in the treehouse to celebrate your new space. Your aunt gave you supplies for the treehouse. She left the supplies at her house, which is down the street. You need to take items from her house up to your treehouse for the party.

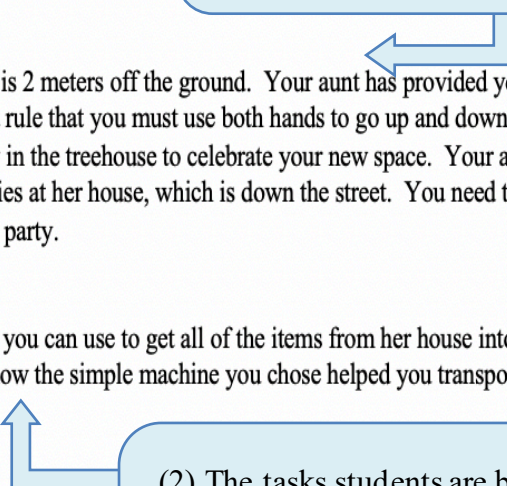
Task:
Your task is to determine which simple machines you can use to get all of the items from her house into your treehouse safely. You will also need to describe how the simple machine you chose helped you transport the objects into your treehouse.

Items to put in your tree house include:

- you and your friends
- chairs
- telescope
- rug
- party snacks

(2) The task scenario is an authentic experience for (some) students. Students have probably used or seen tree houses and ladders.

(2) The tasks students are being asked to do are authentic and accessible for students. These activities are similar to creating a plan, which students have likely done before.



Criterion 3: Language use for expressing reasoning

Criterion 3A. The performance assessment supports language use and development by providing multiple means of accessing and using developmentally appropriate academic and disciplinary language for the students to express their reasoning.

Rating

☐ 0-No Evidence

☐ 2-Partial Evidence

☐ 1-Limited Evidence

☐ 3-Full Evidence

Evidence

Criterion 3B. The performance assessment should require students to use one or more forms of language to communicate their reasoning. The performance assessment may provide access to functional, academic, and disciplinary language in various forms of language media (text, video, audio, oral) OR provide opportunity to practice the use of language through multiple means of expression and language production (text, language media production, oral language, or conversation with peers).

Rating

☐ 0-No Evidence

☐ 2-Partial Evidence

☐ 1-Limited Evidence

☐ 3-Full Evidence

Evidence

Example of Criterion 3 – Language use for expressing reasoning

In the space below, draw a picture of the tools you would use to transport the items from your aunt's house and lift them into the treehouse. Please label the simple machine(s) in your drawing.



Sequence

List the steps, in order, that you would take to get all of the items from your aunt's house into the treehouse. If you need more steps, add them on a separate page.

1.

(3) Students have multiple ways to express their understanding using written language.

Criterion 4: Success criteria for students

Criterion 4A. The performance assessment includes a rubric or other appropriate scoring tools (e.g., checklist, analytic rubric) with scoring dimensions that are tightly aligned to performance expectations of the intended learning outcomes targeted within the performance assessment. Criteria should include language objectives, if applicable.

Rating

- | | |
|---|---|
| <input type="checkbox"/> 0-No Evidence | <input type="checkbox"/> 2-Partial Evidence |
| <input type="checkbox"/> 1-Limited Evidence | <input type="checkbox"/> 3-Full Evidence |

Evidence

Criterion 4B. The scoring tool is written clearly and concisely, with audience-friendly language, as appropriate. Language of the scoring tool should describe how a response demonstrates performance expectations so that the tool may be used to provide feedback to students about their work and how it can be improved.

Rating

- | | |
|---|---|
| <input type="checkbox"/> 0-No Evidence | <input type="checkbox"/> 2-Partial Evidence |
| <input type="checkbox"/> 1-Limited Evidence | <input type="checkbox"/> 3-Full Evidence |

Evidence

Criterion 4C. The scoring tool or feedback methodology should be used across performance assessments within the course so that results on the performance assessment can be used to communicate a consistent set of expectations to students, monitor students' academic growth over time, inform instructional decisions, and communicate student proficiency to others (e.g., parents/guardians).

Rating

☐ 0-No Evidence

☐ 2-Partial Evidence

☐ 1-Limited Evidence

☐ 3-Full Evidence

Evidence

Example of Criterion 4 – Success criteria for students

Common Rubric Categories:

- Developing and using models
- Obtaining, evaluating, and communicating information
- Content

(4) Student success criteria align with the performance expectations. These categories refer to components of the common rubric from VDOE.

Criterion 5: Student directions, prompt, and resources/materials

Criterion 5A. The student-facing task prompt, directions, and resources/materials are aligned to the intended learning outcomes, task purpose, and performance expectations being assessed (i.e., the student product will provide evidence of the performance expectations).

Rating

☐ 0-No Evidence

☐ 2-Partial Evidence

☐ 1-Limited Evidence

☐ 3-Full Evidence

Evidence

Criterion 5B. The student-facing task prompt, directions, and resources/materials are clear, complete, written in accessible language appropriate to the grade level, and organized for students in an accessible format.

Rating

☐ 0-No Evidence

☐ 2-Partial Evidence

☐ 1-Limited Evidence

☐ 3-Full Evidence

Evidence

Criterion 5C. The task prompt/directions, topic, context (scenario), and materials/resources are sensitive to the community and free of bias.

Rating

☐ 0-No Evidence

☐ 2-Partial Evidence

☐ 1-Limited Evidence

☐ 3-Full Evidence

Evidence

Example of Criterion 5 – Student directions, prompt, resources/materials

Scenario:

Your aunt built a treehouse in your backyard that is 2 meters off the ground. Your aunt has provided you a ladder to access the treehouse and she has made a rule that you must use both hands to go up and down the ladder. You and your friends want to have a party in the treehouse to celebrate your new space. Your aunt gave you supplies for the treehouse. She left the supplies at her house, which is down the street. You need to take items from her house up to your treehouse for the party.

Task:

Your task is to determine which simple machines you can use to get all of the items from her house into your treehouse safely. You will also need to describe how the simple machine you chose helped you transport the objects into your treehouse.

Items to put in your tree house include:

- you and your friends
- chairs
- telescope

(5) Student Directions, Prompt, Resources and Materials are present and clear.

Criterion 6: Accessibility

Criterion 6A. The performance assessment is designed to accommodate the participation of all students. Directions for teachers for the performance assessment identify appropriate supports or alternatives to facilitate accessibility while maintaining the validity and reliability of the assessment.

Rating

- | | |
|---|---|
| <input type="checkbox"/> 0-No Evidence | <input type="checkbox"/> 2-Partial Evidence |
| <input type="checkbox"/> 1-Limited Evidence | <input type="checkbox"/> 3-Full Evidence |

Evidence

Criterion 6B. The performance assessment is accessible and allows for differentiating the ways students demonstrate their knowledge, such as through the application of principles of Universal Design for Learning (UDL). Refer to the National Center on UDL at the [Center for Applied Special Technology](#) (CAST).

Rating

- | | |
|---|---|
| <input type="checkbox"/> 0-No Evidence | <input type="checkbox"/> 2-Partial Evidence |
| <input type="checkbox"/> 1-Limited Evidence | <input type="checkbox"/> 3-Full Evidence |

Evidence

Example of Criterion 6 – Accessibility

Accessibility:


Accommodations/Modifications

- Give students a word bank to use for the different tasks.
- Give students sentence stems to help complete their written report.

Extensions:

- Students create a Plus-Minus-Interesting chart for the different tools proposed to lift each type of object results.
- Ask students to describe how the knowledge of simple machines helps engineers as they construct new devices.

(6) There are options for adapting the performance assessment to meet different student needs.



Criterion 7: Feasibility

Criterion 7A. Student-facing prompts, directions, resources/materials, and scoring tools are included. Resources and materials required by the performance assessment are realistic and easily accessible to teachers.

Rating

☐ 0-No Evidence

☐ 2-Partial Evidence

☐ 1-Limited Evidence

☐ 3-Full Evidence

Evidence

Criterion 7B. Duration of implementation of the performance assessment is indicated and is realistic for the complexity of the assessment and the scope of performance expectations being assessed.

Rating

☐ 0-No Evidence

☐ 2-Partial Evidence

☐ 1-Limited Evidence

☐ 3-Full Evidence

Evidence

Criterion 7C. If the performance assessment is implemented over multiple lessons, a schedule indicating how the performance assessment is implemented across the lessons is included. Information about students' prior learning and how the performance assessment fits within a learning sequence is included.

Rating

☐ 0-No Evidence

☐ 2-Partial Evidence

☐ 1-Limited Evidence

☐ 3-Full Evidence

Evidence

Example of Criterion 7 – Feasibility

Lesson Overview and Preparation:	
Implementation	
BEFORE: <i>Preparing students for the task</i> Resources Needed: <ul style="list-style-type: none"> • student handouts • sample simple machines available for students to examine while they are designing their plan 	Students should have background knowledge and be able to: <p>The performance assessment should be completed with a partner. Students should have had opportunities for guided and independent practice with design challenges.</p> <p>The assessment is dependent upon knowledge of simple machines. Students should be aware of the six types of simple machines (level, pulley, inclined plane, wedge, screw, & wheel and axle) as well as their uses. Students should also understand that a simple machine makes work easier by reducing the force needed to move an object over a distance.</p> Students should be able to: <ul style="list-style-type: none"> • Design a plan, using at least one simple machine that could be used transport materials and lift them to a tree house. Pre-teaching Suggestions: <ul style="list-style-type: none"> • Allow students the opportunity to manipulate physical samples of simple machines. • Review types of simple machines and their purpose. Questions to Consider: <ul style="list-style-type: none"> ○ What are the six types of simple machines? ○ How do simple machines make work easier? ○ What simple machines do you use or see being used by to others in your daily life?
	<ul style="list-style-type: none"> • Distribute a task description to each student. Read the task description together.

(7) Information about what students should already have learned or be able to do is present



PRACTICE IT: Using the criteria to evaluate your performance assessment

For this activity you will need your own performance assessment. Use the descriptions from the Quality Criteria Tool, the tables provided here, and the examples provided in the last activity to rate your own performance assessment for each of the criteria. You will also provide evidence for each rating.

Criterion 1: Standards/intended learning outcomes

Criterion 1A. Virginia Standards of Learning selected for the performance assessment are clearly listed in a task template, developmentally appropriate for target students, and aligned to the grade-level scope and sequence or grade-level curriculum. Performance assessment components, resources/materials, and student products are aligned to the listed SOLs.

How to meet criterion 1A

To meet this criterion with **full evidence** (a score of 3), the performance assessment should:

- Indicate which VA SOLs and intended learning outcomes are associated with each task in the PA, such as through an Assessment Blueprint (see next column).
- Identify and specify the target set of students in the performance assessment template.
- Reference the relevant aspects of the grade-level scope and sequence or curriculum materials.
- Ensure that all materials are aligned to the VA SOLS; for example, a grade 4 performance assessment aligned to SOLs about the classification of common organisms may require students to draw an imaginary creature, but the student would not be rated upon his or her artistic skills because those are not part of the SOLs.

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

☐ 3: Full Evidence

Your evidence:

Criterion 1B. The performance assessment goes beyond simple recall, elicits evidence of complex student thinking, and requires application of disciplinary or cross-disciplinary concepts, practices, and/or transferable skills, such as application, analysis, evaluation, synthesis, or original creation.

How to meet criterion 1B

To meet this criterion with full evidence (a score of 3), the level of complexity of each task should be indicated in the task template. The tasks should elicit evidence of complex student thinking and require application of disciplinary or cross-disciplinary concepts, practices, and/or transferable skills.

For assistance in determining the appropriate level of complexity, consult a model of cognitive complexity, such as the updated Bloom Taxonomy (Anderson & Krathwohl, 2001).

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

☐ 3: Full Evidence

Your evidence:

Criterion 1C. The performance assessment provides an opportunity for students to develop and demonstrate (even if not explicitly assessed):

- Deeper learning competencies, defined as mastering rigorous academic content.
- Learning how to think critically and solve problems.
- Working collaboratively.
- Communicating effectively.
- Directing one's own learning.
- Developing an academic mindset.

The performance assessment may also provide opportunities for students to develop and demonstrate:

- Life-Ready competencies defined by the Profile of a Virginia Graduate as content knowledge, career planning, workplace skills, and community and civic responsibility.
- Technology-related competencies.

How to meet criterion 1C

A performance assessment that meets this criterion with full evidence (a score of 3) will include several of these opportunities. Evidence of these may be present in the standards and learning outcomes, the task prompt, the student or teacher instructions, or the rubric.

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

☐ 3: Full Evidence

Your evidence:

Criterion 2: Authenticity

Criterion 2. The performance assessment is authentic along the dimensions:

- The performance assessment's topic, context (scenario), materials/resources, products, and purpose/audience (i.e., what students are asked to do and for whom) are relevant to the real world, students' community, students' interests, future careers, or other meaningful context. The performance assessment asks students to do work authentic to the discipline (i.e., what adult practitioners of the discipline do), such as: science inquiry; math problem-solving; analyzing and critiquing a text; analyzing and evaluating historical sources.

How to meet criterion 2

A performance assessment that meets this criterion with full evidence (a score of 3) will have some elements of authenticity along both dimensions. Your experience with your students and community will help you determine what defines an authentic scenario. Consider:

- Altering the scenario to include elements that are authentic to your students' experiences in their community (e.g., local environmental issues).
- Altering the scenario to include elements that are authentic to the practice of science or engineering (e.g., investigating how a cancer drug interrupts the process of mitosis or designing a new playground for a school).
- Changing the audience students are speaking to (e.g., writing a letter to an elected official or presenting to the school principal).

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

☐ 3: Full Evidence

Your evidence:

Criterion 3: Language use for expressing reasoning

Criterion 3A. The performance assessment supports language use and development by providing multiple means of accessing and using developmentally appropriate academic and disciplinary language for the students to express their reasoning.

How to meet criterion 3A

A performance assessment that meets this criterion with full evidence (a score of 3) will include language familiar to students and provide supports for understanding the meaning of any disciplinary specific language. Consider:

- Providing context for any new vocabulary in the form of parentheses containing synonyms.
- Using new disciplinary language in multiple ways to model the language for students (e.g., incorporated into your teaching prior to the performance assessment, labeling figures, embedding in text).
- Building up new vocabulary over time before or during the performance assessment.

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

☐ 3: Full Evidence

Your evidence:

Criterion 3B. The performance assessment should require students to use one or more forms of language to communicate their reasoning. The performance assessment may provide access to functional, academic, and disciplinary language in various forms of language media (text, video, audio, oral) OR provide opportunity to practice the use of language through multiple means of expression and language production (text, language media production, oral language, or conversation with peers).

How to meet criterion 3B

A performance assessment that meets this criterion with full evidence (a score of a 3) will require students to use disciplinary language to express their reasoning multiple times throughout the performance assessment. Consider:

- Offering hints for students to use specific terminology in some written responses (e.g., using kinetic and potential energy in a description of the transformation of energy in a self-propelled vehicle).
- Using multiple types of tasks for students to demonstrate their understanding of the disciplinary language (e.g., annotating a conceptual model they have developed, writing a description of a scientific phenomenon, or revising a student’s fictional work to be more scientifically accurate).

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

☐ 3: Full Evidence

Your evidence:

Criterion 4: Success criteria for students

Criterion 4A. The performance assessment includes a rubric or other appropriate scoring tools (e.g., checklist, analytic rubric) with scoring dimensions that are tightly aligned to performance expectations of the intended learning outcomes targeted within the performance assessment. Criteria should include language objectives, if applicable.

How to meet criterion 4A

To meet this criterion with full evidence (a score of 3), a performance assessment should include a student-facing rubric that is aligned with the performance expectations. Consider:

- Using the Tool for Analyzing Standards (see appendix A) to evaluate the alignment of your rubric with both skills and content.
- Using a common rubric from the Virginia Department of Education (VDOE) (see appendix C) for example rubric text for measuring skills and practices.

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

☐ 3: Full Evidence

Your evidence:

Criterion 4B. The scoring tool is written clearly and concisely, with audience-friendly language, as appropriate. Language of the scoring tool should describe how a response demonstrates performance expectations so that the tool may be used to provide feedback to students about their work and how it can be improved.

How to meet criterion 4B

To meet this criterion with full evidence (a score of 3), the student-facing rubric for a performance assessment should use language that is familiar to your students and provides examples or enough other information that makes it clear to students how to improve their work. Consider:

- Supplementing (e.g., in parentheses) or replacing any vocabulary words that may be unclear or unfamiliar to students.
- Scaffolding vocabulary development for any unfamiliar words, terms, or practices.
- Adding language that clearly communicates strengths and weaknesses and how students may improve their work.
- Adding language that sets expectations for students in audience-friendly language.

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

☐ 3: Full Evidence

Your evidence:

Criterion 4C. The scoring tool or feedback methodology should be used across performance assessments within the course so that results of the performance assessment can be used to communicate a consistent set of expectations to students, monitor students' academic growth over time, inform instructional decisions, and communicate student proficiency to others (e.g., parents/guardians).

How to meet criterion 4c

To meet this criterion with full evidence (a score of 3), use a generalized performance assessment rubric similar in structure and content to other performance assessment rubrics used in your class. You can use the common rubric provided by VDOE (appendix C) to meet this criterion. Consider:

- Using components of the common rubric from VDOE for creating common ways to measure practices across performance assessments. This will also give students a way to monitor their growth over time.
- Gathering rubrics used by teachers who may have used performance assessments with your students in the previous school year to understand what students are already familiar with.
- Aligning your rubric to skills and practices, rather than content, to make the rubric more versatile for use with multiple performance assessments.

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

☐ 3: Full Evidence

Your evidence:

Criterion 5: Student directions, prompt, resources/materials

Criterion 5A. The student-facing task prompt, directions, and resources/materials are aligned to the intended learning outcomes, task purpose, and performance expectations being assessed (i.e., the student product will provide evidence of the performance expectations).

How to meet criterion 5a

To meet this criterion with full evidence (a score of 3), the performance assessment should include student-facing materials that are aligned with the performance expectations. Consider:

- Using the Tool for Analyzing Standards (see appendix A) to evaluate the alignment of your rubric with both skills and content.

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

☐ 3: Full Evidence

Your evidence:

Criterion 5B. The student-facing task prompt, directions, and resources/materials are clear, complete, written in accessible language appropriate to the grade level, and organized for students in an accessible format.

How to meet criterion 5B

To meet this criterion with full evidence (a score of 3), the performance assessment should use language that is familiar to your students and be clear and well-organized so that students can complete the performance assessment without requiring extra instructions. Consider:

- Having yourself or, preferably, someone else test the performance assessment to make sure the organization of the student-facing materials is clear.
- Supplementing (e.g., in parentheses) or replacing any vocabulary words that may be unclear or unfamiliar to students.
- Scaffolding any unfamiliar but important vocabulary words into instruction prior to the performance assessment.
- Using sentence starters to model how you would like students to begin writing and organizing their thoughts.

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

☐ 3: Full Evidence

Your evidence:

Criterion 5C. The task prompt/directions, topic, context (scenario), and materials/resources are sensitive to the community and free of bias.

How to meet criterion 5C

To meet this criterion with full evidence (a score of 3), the performance assessment should NOT reinforce stereotypes or connote that all members of a group are the same (e.g., girls are bad at math). There should be no examples of bias in the student materials. Consider reading the guidelines at <https://www.adl.org/education/resources/tools-and-strategies/guidelines-for-achieving-bias-free-communication> and checking the performance assessment materials against them.

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

☐ 3: Full Evidence

Your evidence:

Criterion 6: Accessibility

Criterion 6A. The performance assessment is designed to accommodate the participation of all students. Directions for teachers for the performance assessment identify appropriate supports or alternatives to facilitate accessibility while maintaining the validity and reliability of the assessment.

How to meet criterion 6A

To meet this criterion with full evidence (a score of 3), a performance assessment should provide a few different ways students can express what they know. Consider:

- Providing multiple modes through which a student can demonstrate knowledge (e.g., a drawing of a model of energy transformation in a solar oven with annotations or a description of what is happening in paragraph format).

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

☐ 3: Full Evidence

Your evidence:

Criterion 6B. The performance assessment is accessible and allows for differentiating the ways students demonstrate their knowledge, such as through the application of principles of Universal Design for Learning (UDL). Refer to the National Center on UDL at the [Center for Applied Special Technology](#) (CAST).

How to meet criterion 6B

To meet this criterion with full evidence (a score of 3), all students in your class should be able to access the performance assessment through various means. Consider:

- Using larger text on print copies of materials.
- Using online materials that can take advantage of automatic text resizing and text-to-speech capabilities.
- Using closed captions on any videos (YouTube offers this as an option).
- Making sure any colors used will be differentiable to colorblind students. For example, you can use shades or patterns to distinguish between data on a bar graph.

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

☐ 3: Full Evidence

Your evidence:

Criterion 7: Feasibility

Criterion 7A. Student-facing prompts, directions, resources/materials, and scoring tools are included. Resources and materials required by the performance assessment are realistic and easily accessible to teachers.

How to meet criterion 7A

A performance assessment that meets this criterion with full evidence (a score of 3) should include all necessary student-facing materials for implementing the performance assessment. The materials should also be sufficiently detailed that the path through the performance assessment (e.g., how to use the materials, what the questions are specifically asking, and any other instructions) is clear to students. Consider:

- Asking another teacher to test the student-facing materials by doing the performance assessment as a student to find any points that are unclear.
- Cross-referencing any documents that should specifically go together on the student materials. For example, reference the rubric students should use to evaluate their own work in a prompt for explaining their reasoning.

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

☐ 3: Full Evidence

Your evidence:

Criterion 7B. Duration of implementation of the performance assessment is indicated and is realistic for the complexity of the assessment and the scope of performance expectations being assessed.

How to meet criterion 7B

A performance assessment that meets this criterion with full evidence (score of 3) should include information on the duration of the performance assessment. The duration should be realistic for the scope of the performance assessment (the purpose) and the complexity of the performance assessment. Consider:

- Is the length of time given for each type of task enough for your students? If there are any types of activities students are not familiar with, the assessment could take more time.
- If the performance assessment is spread over multiple days, include an overflow day in the middle of the assessment period to help alleviate time pressures at the end.

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

☐ 3: Full Evidence

Your evidence:

Criterion 7C. If the performance assessment is implemented over multiple lessons, a schedule indicating how the performance assessment is implemented across the lessons is included. Information about students' prior learning and how the performance assessment fits within a learning sequence is included.

How to meet criterion 7C

A performance assessment that meets this criterion with full evidence (score of 3) will include an implementation schedule. The performance assessment will also include information about prior learning students should have already done before doing the performance assessment. Consider:

- Consider: How does this performance assessment fit with what you have already done in your class and what you plan to do afterwards? Make this clear for students by using consistent formatting or instructions.
- Consider: What are some ways to make it explicit to students how different components of your curriculum come together in this performance assessment?

Your rating:

☐ 0: No Evidence

☐ 2: Partial Evidence

☐ 1: Limited Evidence

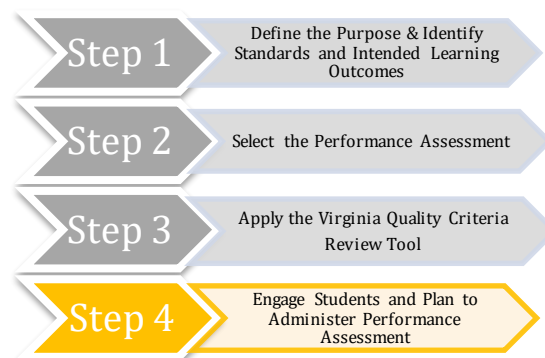
☐ 3: Full Evidence

Your evidence:

Step 4: Engage Students and Plan to Administer Performance Assessment

Step 4 of the Identifying and Using Performance Assessments process focuses on the ways in which students can be engaged in the assessment process and the preparation needed to implement a performance assessment. This step addresses the questions:

- How can I ensure that students are actively engaged in the assessment process?
- How much time and what resources are adequate for the classroom assessment?



Student engagement

Students benefit from opportunities to be involved in their assessments. Students can be active participants in their own assessment, learning about how they will be evaluated and contributing their own knowledge of their strengths and challenges. When students gain experience in the assessment process, they are better able to foster their own continued learning. Students can engage in the assessment process through self-assessment, peer assessment,

Box 11. Student-Led Conferences

Allow students to reflect on and share their work or progress over a period of time with their parents or guardian and teacher. If John is in a computer drafting class, he might prepare for his student-led conference by gathering examples of his work, making notes on what he has learned, what work he is proud of, and what skills he wants to keep developing. At the conference, he would present these examples and talk through them with his teacher and parent. Together, John, his teacher and his parent would: identify desired goals; discuss the evidence of his current performance; and develop a shared understanding of how to close the gap between the learning expectations and his current performance.

student-led conferences, or even helping to develop evaluation guidelines or setting assessment purposes (Black and William, 1998). In all these examples, the teacher plays a critical role in providing the templates, essential questions, or rubrics the students use to guide their reflections.

Assessment planning

To prepare for a classroom assessment, a teacher needs to consider the time and resources needed to successfully develop and administer the assessment. Regardless of the assessment, preparation for it should reflect the complexity of the learning students are required to demonstrate. For example, if a teacher is administering a multi-step performance assessment, the preparation may be more significant than if the teacher is planning to assess students based on an initial classroom discussion. In other words, the preparation should match the task. In addition, teachers should provide sufficient notice to students about the timing, expectations, and demands of upcoming assessments. The boxes below outline many of the considerations for planning for an assessment.

Box 12. Time

Allow adequate time to develop assessments, prepare evaluation guidelines, provide feedback to students, and record and report on results. Also, consider scheduling time to collaborate with colleagues if needed.

Box 13. Assessment Materials

Determine what assessment materials are necessary. For example, an assessment may require software, computer access, a performance venue, recording device, or art supplies.

Box 14. Administration Instructions

Develop administration instructions for teachers and students. Ensure the language is appropriate for the audience. Include the estimated amount of time needed for students to complete the assessment. Also, include a plan for when students are absent or do not finish in the allotted time, or for an interruption in testing.

Box 15. Evaluation Materials

Develop evaluation criteria, such as a rubric, and determine how you will deliver feedback to students. Consider when the criteria will be provided to students—most often before the assessment so that students know what the expectations are.

Working with rubrics

A rubric is an evaluation tool (usually in a table format) that is used to assess student performance along a set of criteria. Rubrics are a means of communicating expectations for student performance on an assessment and providing focused feedback on a student's progress.

Using a rubric focuses students and teachers on:

- The importance of learning and understanding.
- Clear expectations for student performance.
- The reliable approaches for scoring student work.
- Meaningful feedback concerning a student's strengths and weaknesses

A rubric typically consists of two components: *criteria* (the characteristics of good performance on a task) and *levels of performance* (the degree to which a criterion has been met). The *criteria* in a rubric (generally found as the table rows on a rubric) include a description of each element of the assessment and may also include performance samples that illustrate each of the levels of performance. The *levels of performance* in a rubric (generally found as the table columns on a rubric) determine to what degree the student has met each criterion. Rubrics provide a standardized means of evaluation that can be tailored to the goals of your assessment.

Types and uses of rubrics

Teachers may choose a certain kind of rubric depending on the task or tasks being assessed. Two different types of rubrics will be discussed as part of this workshop: generalized rubrics and task-specific rubrics. The table below summarizes the differences between these two types of rubrics.

Table 3. Types of rubrics

<i>Types</i>	<i>Purpose/Distinction</i>	<i>Advantage</i>	<i>Disadvantage</i>
Generalized	Applies essential criteria to evaluate several authentic, content-specific tasks or assessments.	Teacher can use the same rubric across different tasks, providing evaluation consistency to students.	Feedback may not be specific enough on certain components of the assessment.
Task-specific	Applies essential criteria to evaluate a single content-specific assessment or task.	Provides students with specific criteria that guide performance.	Constructing a separate rubric for each assessment can be time-consuming and limit generalizability across assessments.

Generalized rubrics

The table that follows is an example of a **generalized rubric** that may be used to evaluate a student's performance. It is considered a generalized rubric because a teacher can use it for any scientific explanation activity assigned as part of the course. If a generalized rubric is used, students can understand that these criteria will be used to evaluate each similar assignment they complete, regardless of the specific content. The value of a generalized rubric is that students are presented clear and consistent criteria for each assignment. If the expectations are consistent across assessments, students can learn from previous feedback and improve performance as they move from one task to another similar task.

The example that follows is for a scientific explanation rubric. This rubric specifically addresses students' abilities to construct, use, and/or present an oral and written scientific explanation supported by empirical evidence about a phenomenon. By using this generalized rubric, a teacher can provide consistent feedback on students' practice of constructing an explanation.

Table 4. Sample generalized rubric: Claim, evidence, reasoning scientific explanation rubric

	<i>Below</i>	<i>Approaching</i>	<i>Meeting</i>	<i>Exceeding</i>
Claim	The claim does not address the purpose of the lab, is unclear or incomplete, and does not address the critical content or concept of the lab.	The claim addresses the purpose of the lab but is unclear or incomplete and may be missing some critical content or concepts of the lab.	The claim addresses the purpose of the lab, is clear and complete, and contains all critical content or concepts of the lab.	The claim addresses the purpose of the lab, is clear and complete, and contains all critical content or concepts of the lab. In addition, the student includes original ideas or predictions.
Evidence	The evidence does not support the claim.	The evidence supports the claim, but data are unclear or incomplete.	The evidence supports the claim using clear and complete data.	The evidence supports the claim using clear and complete data. In addition, the student presents evidence comprehensively such as in a narrative or visual form.
Reasoning	The reasoning does not explain the connection between the evidence and the claim.	The reasoning explains the connection between the evidence and the claim but is unclear or incomplete.	The reasoning clearly explains the connection between all the evidence and the claim.	The reasoning clearly explains the connection between all of the evidence and the claim. In addition, the student includes original ideas or applications.

Task-specific rubrics

Task-specific rubrics are helpful for assessments that require specialized performance criteria, making it difficult to use the same rubric across many different assessments. A task-specific rubric allows the teacher to clearly articulate the different criteria that will be involved in identifying the student's level of performance on a particular assessment. For example, for her middle school Earth science course, a teacher may regularly ask students to construct a scientific explanation for various content, and this may take several forms (e.g., written response, oral response, slide presentation). However, she may also ask each student to develop a model to specifically illustrate the ways Earth's tectonic plates interact, and she may be interested in explicitly assessing her students' grasp of the Earth science content. In this instance, a task-specific rubric might be appropriate.

This task-specific rubric evaluates the accuracy with which students' models identify the three types of tectonic plate boundaries and indicate the direction of movement to explain the different ways Earth's tectonic plates can interact with each other at their boundaries, and what causes these patterns of movement. This rubric focuses explicitly on a standard of learning that the teacher wants to assess.

Table 5. Sample task-specific rubric: Plate tectonic boundaries and movement

	<i>Incomplete</i>	<i>Inaccurate</i>	<i>Somewhat Accurate</i>	<i>Mostly Accurate</i>	<i>Accurate</i>
Accuracy	Response is incomplete, irrelevant, contains insufficient evidence to demonstrate understanding of the disciplinary core idea <i>OR</i> the student has failed to respond to the prompt.	Response indicates minimal understanding. Only one or two of the plates is drawn and both the labels and direction of motion are incorrect.	Response indicates errors or omissions. Two or three of the plates are drawn correctly. The labels are incorrect or the direction of motion is incorrect.	Response indicates minor errors or omissions. All three plates are drawn correctly but either the labels are incorrect or the direction of motion is incorrect.	Response demonstrates no errors or omissions. All three plates are drawn correctly and both the labels and the direction of motion are correct.

Notice that in both the generalized and the task-specific rubric examples, a few details have been included in the performance-level cells to expand upon the rubric's criteria. These details, called *descriptors*, are often helpful because they spell out what is expected of students for each level of performance. Descriptors also help teachers distinguish between varying levels of student work.

Both types of rubrics can improve a student's performance because they make the teacher's expectations clear and show students how they can meet those expectations, which can result in marked improvements in the quality of student work and learning. A rubric can help define and communicate quality and can also encourage students to be more thoughtful judges of their own work.

Regardless of the type of rubric used, teachers should provide the rubric to students as they embark on the task so that they can use the rubric to assess their own work, rather than the teacher using it only at the end of the assessment process to review the final product. Additionally, either type of rubric should include scoring dimensions that are tightly aligned to

performance expectations of the intended learning outcomes assessed by the performance assessment, which is reflected in the Quality Criteria Tool criterion 4a.

Using rubrics for effective feedback

Rubrics are an excellent way to ensure feedback on assessments is specific and targeted. When the feedback is targeted and linked to the explicit learning outcomes, students will have a better understanding of their strengths and weaknesses and will be able to take responsibility for their learning. A quality rubric enables and supports conversation between the teacher and learner, or peer and learner, and allows for self-reflection. Therefore, quality rubrics:

- Communicate expectations.
- Use language that focuses on what is present and not just what is absent.
- Clearly communicate strengths and weaknesses and how the student may improve.
- Provide effective feedback that is directly related to student performance on the assessment task.
- Ensure accessibility for all learners, including those who are continuing to learn English and those with learning or other types of disabilities.

To ensure you can provide effective feedback to your students, your rubric should include enough performance levels to showcase a range of student abilities. A rubric should provide feedback to students who may exceed the standards or expectations as well as students who may be approaching a concept or skill for the first time. To accomplish this, the rubric should include clearly articulated descriptors within each performance level. The example below showcases the difference between a poorly written and a well-written descriptor. In this example, the teacher is evaluating student papers for the presence of reference citations.

Table 6. Example of descriptors

<i>Example of a Poorly Constructed Descriptor</i>	Student includes many sources and citations both in text and in the references section.
<i>Example of a Well-Constructed Descriptor</i>	Student includes 10-12 sources in bibliography, along with all in-text citations, formatted properly according to APA guidelines.

The poorly constructed descriptor consists of vague language about expectations. What does the word “several” mean? How many sources are required? Are students expected to complete in-text citations along with a works cited page? Is there a particular format to follow for the references? A student may have all these questions. However, as you will see in the well-constructed descriptor, the teacher answers all the students’ questions, clearly describing how their work will be evaluated.

Rubric development

If you plan to use an existing performance assessment that does not have a rubric, you’ll want to develop your own if a common rubric from your school, district, or state is not available. Consider the following elements of a quality rubric:

- Criteria are objective and based on observable behaviors.
- Language clearly communicates expectations for students in audience-friendly language.
- Language focuses on what is present and not just what is absent.
- Rubric clearly communicates strengths and weaknesses and how students may improve their work.
- Rubric provides effective feedback directly related to student performance on the assessment or task.
- Each performance level is clearly stated and easily distinguished from the others.

The table below provides some guidance on how to develop a rubric. The questions on the left of the table indicate what to consider in the development of the rubric. On the right, the action describes the placement of content for your rubric associated with your response to these questions.

Table 7. Considerations for development of rubrics

<i>Question</i>	<i>Action</i>
<p>What criteria or essential elements must be present in a student's work to ensure that it is of high quality?</p> <ul style="list-style-type: none"> These should be the criteria that help the teacher distinguish quality work from poor work. 	<p>Include these as rows in your rubric.</p>
<p>How many levels of performance do I wish to illustrate for students?</p> <ul style="list-style-type: none"> The levels should describe a range of performance from beginning to advanced (e.g., beginning, developing, proficient, and advanced). 	<p>Include these as columns in your rubric and label them.</p>
<p>For each criterion or essential element, what is a clear description of performance at each achievement level?</p> <ul style="list-style-type: none"> Use objective descriptions that help provide guidance to students. 	<p>Include descriptions in the appropriate cells of the rubric.</p>
<p>When I use the rubric, what aspects work well and what aspects need improvement?</p> <ul style="list-style-type: none"> Does the rubric help you distinguish among the levels of performance in a student sample? Are the criteria appropriate? 	<p>Revise the rubric accordingly.</p>

Source: Adapted from Huba, M. E., & Freed J. E. (2000). Learner-centered assessment on college campuses: Shifting the focus from teaching to learning. Boston, MA: Ally & Bacon.

Here are a few tips on how to develop each of these rubric sections:

Criteria: When defining your assessment's criteria, it may be helpful to think back to step 2. The learning expectations help define the essential elements of student performance. The specific components of each dimension of the unpacked Performance Expectation completed in step 2 provide information that may be helpful in specifying what you are looking for in students'

products or performance. These considerations will guide the development of the rubric's criteria. Keeping this information in mind will help ensure that your rubric is well aligned with the assessment's purpose and the Performance Expectation.

Levels of performance: When you determine performance levels, it helps to think about the development of learning over time. To represent this chronologically, we suggest listing performance levels from left to right in order of increasing mastery.

Performance descriptors: In your performance descriptors, the information listed should tell students precisely what performance should look like at each level. In addition, the descriptors should be clear about how a student's work might be distinguished from the work of other students. Writing clear descriptors, aligned with specific tasks or learning expectations, will present students with clear expectations and provide teachers with an opportunity to provide consistent and objective evaluations. The rubric will ultimately offer quality feedback to students for self-reflection on their learning. Here are some final considerations for using rubrics:

- Rubrics enable multiple evaluators to apply the same criteria to evaluating assessments. Evaluators should participate in training together to ensure that they are applying the rubric criteria consistently.
- Rubrics may be used to provide formative feedback for drafts of work before a final submission is due. For example, a student can use a rubric to assess his or her peers' work.
- Rubrics allow teachers to help students understand more clearly and completely how the teacher evaluated their work or performance.
- Rubrics also help teachers authentically monitor a student's learning process.
- Rubrics may inform instructional practice by allowing teachers to modify future lessons based on student performance.



FOCUS

A final note about the use of rubrics: It is important to remember that student performance on an assessment should inform instruction. Rubrics may be useful evaluation tools that accompany assessments for this purpose. Teachers should be attentive to patterns that may suggest the need to modify instruction or the need to revisit the content, based on patterns that emerge across student performance using the rubric.

Discussion of Next Steps

At this point, you should have developed familiarity with the four-step process for implementing performance assessments development. You have now made progress in selecting and refining a draft assessment and are well on your way to implementing an assessment in your classroom.

In working through the template and the activities, we hope you have resolved some of the questions that may have emerged as you started thinking about your assessment. Now is a good time to step back, examine the process, and consider any remaining questions you have about the process for reviewing and refining a performance assessment. If you have not already done so, consider seeking input and feedback on your assessment from your fellow educators or peer groups.

In addition, you should consider how you will use the data you collect while your students are doing a performance assessment. You may want to use the data from your evaluations of student work to inform your next steps while teaching, or to show student progress on specific science skills and practices throughout the year. By using the same rubric for multiple performance assessments or projects, you can evaluate student progress more easily and track that progress over time.

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Appendix A: Virginia Quality Criteria Review Tool for Performance Assessments

Virginia Quality Criteria Review Tool for Performance Assessments

Revised: June 2019

This document details a set of criteria for the development of performance assessments that measure the application of content knowledge and skills. The criteria are designed to support comparability in rigor and quality across the state.

Briefly, the seven criteria include:

- 1: Standards/Intended Learning Outcomes
- 2: Authenticity
- 3: Language Use for Expressing Reasoning
- 4: Success Criteria for Students
- 5: Student Directions, Prompt, and Resources/Materials
- 6: Accessibility
- 7: Feasibility

It is not expected that every quality performance assessment will have full evidence that corresponds to each description within the Virginia Quality Criteria Review Tool. For example, it is not expected that a task include each of the deeper learning competencies listed in criterion 1C (i.e., mastering rigorous academic content; learning how to think critically and solve problems; working collaboratively; communicating effectively; directing one's own learning; and developing an academic mindset), but a quality task should provide the opportunity for students to demonstrate one or more of these competencies. Additionally, the criteria may be considered in any order that suits the division's needs and purpose. School divisions are encouraged to use this tool not only as they develop new performance assessments, but also as they evaluate the quality of existing tasks. If a task does not fully meet the expectations detailed for that criterion, the school division should use the evidence or rationale to modify and improve the task before using that task with students.

Virginia Quality Criteria Review Tool for Performance Assessments

Revised: June 2019

Criterion 1: Standards/Intended Learning Outcomes

The rubric for the quality rating is as follows: 0-No Evidence; 1-Limited Evidence; 2-Partial Evidence; 3-Full Evidence.

#	Description	Quality Rating	Evidence or Rationale
1A	Virginia Standards of Learning selected for the performance assessment are clearly listed in a task template, developmentally appropriate for target students, and aligned to the grade-level scope and sequence or grade-level curriculum. Performance assessment components, resources/materials, and student products are aligned to the listed SOLs.		
1B	The performance assessment goes beyond simple recall, elicits evidence of complex student thinking, and requires application of disciplinary or cross-disciplinary concepts, practices, and/or transferable skills, such as application, analysis, evaluation, synthesis, or original creation.		
1C	<p>The performance assessment provides an opportunity for students to develop and demonstrate (even if not explicitly assessed):</p> <ul style="list-style-type: none"> • Deeper learning competencies, defined as mastering rigorous academic content; learning how to think critically and solve problems; working collaboratively; communicating effectively; directing one's own learning; and developing an academic mindset. <p>The performance assessment may also provide opportunities for students to develop and demonstrate:</p> <ul style="list-style-type: none"> • Life-Ready competencies defined by the Profile of a Virginia Graduate as content knowledge, career planning, workplace skills, and community and civic responsibility; • Technology-related competencies; • Integration of intended learning outcomes from two or more subjects. 		

Criterion 2: Authenticity

The rubric for the quality rating is as follows: 0-No Evidence; 1-Limited Evidence; 2-Partial Evidence; 3-Full Evidence.

#	Description	Quality Rating	Evidence or Rationale
2	<p>The performance assessment is authentic along the dimensions:</p> <ul style="list-style-type: none"> The performance assessment's topic, context (scenario), materials/resources, products, and purpose/audience (i.e., what students are asked to do and for whom) are relevant to the real-world, students' community, students' interests, future careers, or other meaningful context. The performance assessment asks students to do work authentic to the discipline (i.e., what adult practitioners of the discipline do), such as science inquiry; math problem-solving; analyzing and critiquing a text; analyzing and evaluating historical sources. 		

Criterion 3: Language Use for Expressing Reasoning

The rubric for the quality rating is as follows: 0-No Evidence; 1-Limited Evidence; 2-Partial Evidence; 3-Full Evidence.

#	Description	Quality Rating	Evidence or Rationale
3A	The performance assessment supports language use and development by providing multiple means of accessing and using developmentally appropriate academic and disciplinary language for the students to express their reasoning.		
3B	The performance assessment should require students to use one or more forms of language to communicate their reasoning. The performance assessment may provide access to functional, academic, and disciplinary language in various forms of language media (text, video, audio, oral) OR provide opportunity to practice the use of language through multiple means of expression and language production (text, language media production, oral language, or conversation with peers).		

Criterion 4: Success Criteria for Students

The Virginia Department of Education’s Common Rubrics, when available, should be used to evaluate and score student work. The rubric for the quality rating is as follows: 0-No Evidence; 1-Limited Evidence; 2-Partial Evidence; 3-Full Evidence.

#	Description	Quality Rating	Evidence or Rationale
4A	The performance assessment includes a rubric or other appropriate scoring tools (e.g., checklist, analytic rubric) with scoring dimensions that are tightly aligned to performance expectations of the intended learning outcomes targeted within the performance assessment. Criteria should include language objectives, if applicable.		
4B	The scoring tool is written clearly and concisely, with audience-friendly language, as appropriate. Language of the scoring tool should describe how a response demonstrates performance expectations so that the tool may be used to provide feedback to students about their work and how it can be improved.		
4C	The scoring tool or feedback methodology should be used across performance assessments within the course so that results on the performance assessment can be used to communicate a consistent set of expectations to students, monitor students’ academic growth over time, inform instructional decisions, and communicate student proficiency to others (e.g., parents/guardians).		

Criterion 5: Student Directions, Prompt, and Resources/Materials

The rubric for the quality rating is as follows: 0-No Evidence; 1-Limited Evidence; 2-Partial Evidence; 3-Full Evidence.

#	Description	Quality Rating	Evidence or Rationale
5A	The student-facing task prompt, directions, and resources/materials are aligned to the intended learning outcomes, task purpose, and the performance expectations being assessed (i.e., the student product will provide evidence of the performance expectations).		
5B	The student-facing task prompt, directions, and resources/materials are clear, complete, written in accessible language appropriate to the grade level, and organized for students in an accessible format.		
5C	The task prompt/directions, topic, context (scenario), and materials/resources are sensitive to the community and free of bias.		

Criterion 6: Accessibility

The rubric for the quality rating is as follows: 0-No Evidence; 1-Limited Evidence; 2-Partial Evidence; 3-Full Evidence.

#	Description	Quality Rating	Evidence or Rationale
6A	The performance assessment is designed to accommodate the participation of all students. Directions for teachers for the performance assessment identify appropriate supports or alternatives to facilitate accessibility while maintaining the validity and reliability of the assessment.		
6B	The performance assessment is accessible and allows for differentiating the ways that students demonstrate their knowledge such as through the application of principles of Universal Design for Learning (UDL). Refer to the National Center on UDL at the Center for Applied Special Technology (CAST).		

Criterion 7: Feasibility

The rubric for the quality rating is as follows: 0-No Evidence; 1-Limited Evidence; 2-Partial Evidence; 3-Full Evidence.

#	Description	Quality Rating	Evidence or Rationale
7A	Student-facing prompts, directions, resources/materials, and scoring tools are included. Resources and materials required by the performance assessment are realistic and easily accessible to teachers.		
7B	Duration of implementation of the performance assessment is indicated and is realistic for the complexity of the assessment and the scope of performance expectations being assessed.		
7C	If the performance assessment is implemented over multiple lessons, a schedule indicating how the performance assessment is implemented across the lessons is included. Information about students' prior learning and how the performance assessment fits within a learning sequence is included.		

Appendix B: VDOE Sample Science Performance Assessment

VDOE Sample Science Performance Assessment

Topic: Simple Machines
Course: Third Grade Science

Content Standards:

Science (2018)

- 3.2 The student will investigate and understand that the direction and size of force affects the motion of an object. Key ideas include
- a) simple machines increase or change the direction of a force; and
 - b) simple and compound machines have many applications.

English

- 3.8 The student will write in a variety of forms to include narrative, descriptive, opinion, and expository.
- e) Write a clear topic sentence focusing on main idea.
 - f) Elaborate writing by including supporting details.
 - i) Write a well-developed paragraph focusing on the main idea.
 - j) Revise writing for clarity of content using specific vocabulary and information.

Computer Science

- 3.6 The student will break down (decompose) a larger problem into smaller sub-problems, independently or collaboratively.

Connection to Profile of a Graduate:

- Critical & Creative Thinking
- Communication

Essential Science Skills and Processes:

- 3.1 The student will demonstrate an understanding of scientific skills and processes by
- a. asking questions and defining problems
 - define a simple design problem that can be solved through the development of an object, tool, process, or system
 - b. planning and carrying out investigations
 - use tools and/or materials to design and/or build a device that solves a specific problem
 - d) constructing and critiquing conclusions and explanations
 - describe how scientific ideas apply to design solutions
 - e) developing and using models

- develop a model (e.g., diagram or simple physical prototype) to illustrate a proposed object, tool, or process
- f) obtaining, evaluating, and communicating information
 - communicate scientific information orally and/or in written formats, including various forms of media as well as tables, diagrams, and charts
 - communicate design ideas and/or solutions with others

Performance Task:

Scenario:

Your aunt built a treehouse in your backyard that is 2 meters off the ground. Your aunt has provided you a ladder to access the treehouse and she has made a rule that you must use both hands to go up and down the ladder. You and your friends want to have a party in the treehouse to celebrate your new space. Your aunt gave you supplies for the treehouse. She left the supplies at her house, which is down the street. You need to take items from her house up to your treehouse for the party.

Task:

Your task is to determine which simple machines you can use to get all of the items from her house into your treehouse safely. You will also need to describe how the simple machine you chose helped you transport the objects into your treehouse.

Items to put in your tree house include:

- you and your friends
- chairs
- telescope
- rug
- party snacks

Common Rubric Categories:

- Developing and using models
- Obtaining, evaluating, and communicating information
- Content

Lesson Overview and Preparation:

Implementation	
<p>BEFORE: <i>Preparing students for the task</i></p> <p>Resources Needed:</p> <ul style="list-style-type: none"> • student handouts • sample simple machines available for students to examine while they are designing their plan 	<p>Students should have background knowledge and be able to:</p> <p>The performance assessment should be completed with a partner. Students should have had opportunities for guided and independent practice with design challenges.</p> <p>The assessment is dependent upon knowledge of simple machines. Students should be aware of the six types of simple machines (level, pulley, inclined plane, wedge, screw, & wheel and axle) as well as their uses. Students should also understand that a simple machine makes work easier by reducing the force needed to move an object over a distance.</p> <p>Students should be able to:</p> <ul style="list-style-type: none"> • Design a plan, using at least one simple machine that could be used transport materials and lift them to a tree house. <p>Pre-teaching Suggestions:</p> <ul style="list-style-type: none"> • Allow students the opportunity to manipulate physical samples of simple machines. • Review types of simple machines and their purpose. <p>Questions to Consider:</p> <ul style="list-style-type: none"> ○ What are the six types of simple machines? ○ How do simple machines make work easier? ○ What simple machines do you use or see being used by to others in your daily life? <ul style="list-style-type: none"> • Distribute a task description to each student. Read the task description together.
<p>DURING: <i>Supporting students with the task</i></p>	<p>Circulate and help student by asking probing questions. You may want to delete the answers in the first row of the table and determine the answer as a class.</p>
<p>AFTER: <i>Reflecting with students after the task</i></p>	<p>Reflection questions to consider and discuss:</p> <p>After the task, the teachers should ask students to explain their design to the class.</p> <ul style="list-style-type: none"> • How many simple machines did you use in your plan? • Does a higher number of simple machines lead to a better plan? • Based on the observations made of the different designs and the class/group discussion, would you revise your design? If so, how?

Accessibility:

Accommodations/Modifications

- Give students a word bank to use for the different tasks.
- Give students sentence stems to help complete their written report.

Extensions:

- Students create a Plus-Minus-Interesting chart for the different tools proposed to lift each type of object results.
- Ask students to describe how the knowledge of simple machines helps engineers as they construct new devices.

Tree House Party



Scenario:

Your aunt built a treehouse in your backyard that is 2 meters off the ground. Your aunt has provided you a ladder to access the treehouse and she has made a rule that you must use both hands to go up and down the ladder. You and your friends want to have a party in the treehouse to celebrate your new space. Your aunt gave you supplies for the treehouse. She left the supplies at her house, which is down the street. You need to take items from her house up to your treehouse for the party.

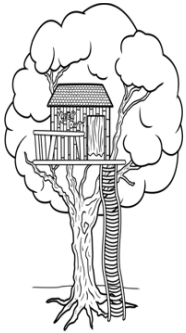
Task:

Your task is to determine which simple machines you can use to get all of the items from her house into your treehouse safely. You will also need to describe how the simple machine you chose helped you transport the objects into your treehouse.

Items to put in your tree house include:

- you and your friends
- chairs
- telescope
- rug
- party snacks

In the space below, draw a picture of the tools you would use to transport the items from your aunt's house and lift them into the treehouse. Please label the simple machine(s) in your drawing.



Sequence

List the steps, in order, that you would take to get all of the items from your aunt's house into the treehouse. If you need more steps, add them on a separate page.

1.



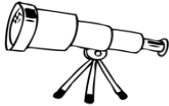


2.

3.

4.

5.

Fill in the chart below listing the simple machines you used and how those simple machines helped you get the items into the treehouse. The first one has been filled in for you.

Item	Simple machine used	How you used the simple machine and how it helped you
	inclined plane	The ladder is an inclined plane. We climbed the ladder. It made it easier for my friends and me to get up to the treehouse.
		
		
		
		

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Appendix C: Common Rubrics from VDOE

Sample 3rd Grade Performance Task Science Virginia Department of Education

Genre: Design Challenge

This rubric provides guidance to teachers in the assessment of design based performance tasks. Not all of the skills provided below may be reflected in a single performance task; only choose scientific skills that are needed to complete your student performance task.

The design process, the application of science and mathematical skills and processes to grade level content, is used to develop and encourage students to use iterative thinking. The design process is reinforced in the third grade science processes:

- a. Asking questions and defining problems
 - define a simple design problem that can be solved through the development of an object, tool, process, or system
- b. Planning and carrying out investigations
 - use tools and/or materials to design and/or build a device that solves a specific problem
 - use appropriate methods and/or tools for collecting data
 - estimate length, mass, volume, and temperature
 - measure length, mass, volume, time, and temperature in metric units using proper tools
- c. Interpreting, analyzing, and evaluating data
 - represent data in tables and bar graphs
 - analyze data from tests of an object or tool to determine if it works as intended
- d. Constructing and critiquing conclusions and explanations
 - generate and/or compare multiple solutions to a problem
 - describe how scientific ideas apply to design solutions
- e. Developing and using models
 - develop a model (e.g., diagram or simple physical prototype) to illustrate a proposed object, tool, or process
- f. Obtaining, evaluating, and communicating information
 - communicate design ideas and/or solutions with others

Science Skills and Processes

Skill	Exceeds Expectations (4)	3.5	Meets Expectations (3)	2.5	Developing (2)	1.5	Emerging (1)	Not Observed
Asking Questions and Defining Problems	Identifies criteria of a problem or design statement that accurately matches the intent of the problem and determines additional possible criteria based on the problem description.		Identifies criteria of a problem or design statement that accurately matches the intent of the problem.		Identifies criteria or design statement that matches the intent of the problem with minor errors.		Identifies criteria of a problem or design statement but it does not match the intent of the problem.	
Planning and Carrying out Investigations: Designing a Solution	Plans a design that accurately and completely matches the criteria, constraints, and intent of the problem and explains how components of the design match the problem.		Plans a design that matches the criteria, constraints, and intent of the problem.		Plans a design that partially matches the criteria, constraints, and intent of the problem.		Plans a design that does not match the criteria, constraints, and intent of the problem.	
Developing and Using Models	Creates a diagram with detailed and precise descriptions of the measurements, indicates appropriate materials and tools needed to construct the prototype, and indicates data to be collected to determine device effectiveness.		Creates a diagram with descriptions of the measurements, and indicates materials and tools needed to construct the prototype.		Creates a diagram with enough detail that another person could duplicate the design (replicable).		Creates a diagram that lack detail and cannot be duplicated by another person.	
	Constructs a prototype that aligns to proposed schematic and explains the diagram.		Constructs a prototype that aligns to proposed diagram.		Constructs a prototype that partially aligns to proposed diagram.		Constructs a prototype that does not align to proposed diagram.	
Planning and Carrying out Investigations: Testing a Design	Conducts repeated trials of the prototype and collects precise data.		Coducts a test of the prototype and collects data.		Conducts a test of the prototype but no data is collected.		No testing of the prototype is conducted.	

Skill	Exceeds Expectations (4)	3.5	Meets Expectations (3)	2.5	Developing (2)	1.5	Emerging (1)	Not Observed
Interpreting, Analyzing and Evaluating Data	Analyze data accurately to determine effectiveness of the prototype and to explain possible error or limitations of the design.		Analyzes data accurately to determine effectiveness of the prototype.		Uses data to determine effectiveness of the prototype but makes minor errors analyzing the data.		Describes the effectiveness of the prototype without using data generated from testing.	
Obtaining, Evaluating, and Communicating Information	Describes the prototype clearly, accurately, and completely with precise detail. Uses relevant scientific and/or mathematical terms/concepts accurately to explain rationale behind the design of the prototype.		Describes the prototype clearly, accurately, and completely with sufficient detail. Uses relevant scientific and/or mathematical terms/concepts accurately to explain rationale behind the design of the prototype.		Describes the prototype simply with minimal detail. Use of relevant scientific and/or mathematical terms/concepts is limited or partially accurate.		Describes the prototype simply with minimal detail. Use of relevant scientific and/or mathematical terms/concepts absent or inaccurate.	
Content SOL_____ (this row should be adapted as appropriate to support foundational core content)	Explains and applies relevant and accurate content.		Explains or otherwise applies relevant and accurate content		Identifies or otherwise applies relevant content with minor errors or omission.		Identifies or makes connections to irrelevant content OR relevant content with major errors or omissions.	

Sample 3rd Grade Performance Task Rubric
Science
Virginia Department of Education

Genre: Laboratory Investigation

This rubric is designed to provide guidance to teachers in the assessment of laboratory based performance tasks. Not all of the skills provided below may be reflected in a single performance task; only choose scientific skills that are needed to complete the student performance task.

Laboratory investigation, the application of science processes and skills within the grade level content, is a fundamental part of science education. The student will demonstrate an understanding of scientific and engineering practices by

- a. Asking questions and defining problems
 - Ask questions that can be investigated and predict reasonable outcomes
 - Ask questions about what would happen if a variable is changed
- b. Planning and carrying out investigations
 - With guidance plan and conduct investigations
 - Use appropriate methods and/or tools for collecting data
 - Estimate length, mass, volume, and temperature
 - Measure length, mass, volume, time, and temperature in metric and U.S. Customary units using proper tools
 - Measure elapsed time
- c. Interpreting, analyzing, and evaluating data
 - Organize and represent data in pictographs or bar graphs
 - Read, interpret, and analyze data represented in pictographs and bar graphs
- d. Constructing and critiquing conclusions and explanations
 - Use evidence (measurements, observations, patterns) to construct or support an explanation
- e. Developing and using models
 - Use models to demonstrate simple phenomena and natural processes
- f. Obtaining, evaluating, and communicating information
 - Read and comprehend reading-level appropriate texts and/or other reliable media
 - Communicate scientific information, design ideas, and/or solutions with others

Skill	Exceeds Expectations (4)	E/M (3.5)	Meets Expectations (3)	M/D (2.5)	Developing (2)	D/E (1.5)	Emerging (1)	Not Observed
Asking Questions and Defining Problems	Asks questions that require empirical evidence to answer and evaluates the testability of the questions.		Asks questions that require empirical evidence to answer.		Asks questions that can be investigated but do not require empirical evidence to answer.		Asks questions that cannot be investigated.	
	Predicts an outcome that is directly related to the question and provides science-based support for the prediction.		Predicts an outcome that is directly related to the question and provides support based on observations made in the classroom or during laboratory activities.		Predicts outcome that is directly related to the question and provides support based on some science misconceptions.		Prediction is indirectly related to the question.	
Planning and Carrying Out Investigations	Designs procedures and uses appropriate tools to make accurate measurements.		Follows procedures and uses tools appropriately to make accurate measurements.		Follows procedures or uses tools inappropriately or incorrectly to make measurements needed to collect data.		Does not follow procedures, uses tools incorrectly, or does not make accurate measurements.	
Interpret, Analyze and Evaluate Data	Accurately represents data using data tables, charts, and/or graphs and includes supporting details.		Accurately represents data using data tables, charts, and/or graphs.		Partially complete or accurate placement of data in data tables, charts, and/or graphs.		Inaccurate or missing data tables, charts, and/or graphs	
	Accurately analyzes or interprets information using a graph and/or table, identifies patterns in the data, and recognizes unusual or unexpected data.		Accurately analyzes or interpret information using a graph and/or table.		Analyzes or interprets information using a graph and/or table but makes minor mistakes.		Analyzes or interprets information using a graph and/or table but makes major mistakes.	
Construct and Critique Conclusions and Explanations	Constructs or evaluates an explanation based on observations or laboratory evidence, relates it to scientific ideas or principles, and applies explanation to new contexts.		Constructs or evaluates an explanation based on observations or laboratory evidence and relates it to scientific ideas or principles.		Explanation or evaluation of evidence is supported by laboratory evidence.		Constructs or evaluates an explanation that includes an irrelevant claim.	

Skill	Exceeds Expectations (4)	E/M (3.5)	Meets Expectations (3)	M/D (2.5)	Developing (2)	D/E (1.5)	Emerging (1)	Not Observed
Develop and Use Models	Makes accurate and labelled models (drawings, diagrams, or other) to represent the process or system and explains the model.		Makes accurate and labelled models (drawings, diagrams, or other) to represent the process or system.		Makes models (drawings, diagrams, or other) to represent the process or system investigated with minor errors.		Makes models (drawings, diagrams, or other) with major errors.	
Obtain, Evaluate, and Communicate Information	Communicates accurate, clear, and complete information. Uses scientific terms and concepts accurately to support explanations.		Communicates accurate, clear, and adequate information. Use of scientific terms to support explanations is evident.		Communicates partially accurate and/or minimal information in explanations. Use of scientific terms in explanations is limited or partially accurate.		Communicates information that reflects inaccurate concepts. Use of scientific terms is inaccurate or absent.	
Content SOL_____	Explains and applies relative and accurate content.		Explains or otherwise applies relevant and accurate content.		Identifies or otherwise applied relevant content with minor errors or omissions.		Identifies or makes connections to irrelevant content OR relevant with major errors or omissions.	

Appendix D: Performance Assessment Template

About your assessment

Use the table below to capture key details about the performance assessment you plan to administer.

<i>Title/Topic</i>	
<i>Short Description</i>	
<i>Intended Grade Level</i>	

<i>Content Standards</i>	<i>Learning Outcomes</i>	<i>Indicators</i>	<i>Aligned Tasks</i>	<i>Level of Complexity</i>	<i>Weight</i>

Types of activities

Use this checklist to capture the essential science skills and processes measured in the performance assessment you will administer. These skills and processes are emphasized in the VDOE common rubric.

<i>Essential Science Skills and Processes</i>		
Asking Questions	Yes <input type="checkbox"/> No <input type="checkbox"/>	Notes:
Defining Problems	Yes <input type="checkbox"/> No <input type="checkbox"/>	Notes:
Planning Investigations	Yes <input type="checkbox"/> No <input type="checkbox"/>	Notes:
Carrying out Investigations	Yes <input type="checkbox"/> No <input type="checkbox"/>	Notes:
Interpreting Data	Yes <input type="checkbox"/> No <input type="checkbox"/>	Notes:
Analyzing Data	Yes <input type="checkbox"/> No <input type="checkbox"/>	Notes:
Evaluating Data	Yes <input type="checkbox"/> No <input type="checkbox"/>	Notes:
Constructing Explanations	Yes <input type="checkbox"/> No <input type="checkbox"/>	Notes:
Critiquing Conclusions	Yes <input type="checkbox"/> No <input type="checkbox"/>	Notes:
Developing Models	Yes <input type="checkbox"/> No <input type="checkbox"/>	Notes:
Using Models	Yes <input type="checkbox"/> No <input type="checkbox"/>	Notes:
Obtaining, Evaluating, and Communicating Information	Yes <input type="checkbox"/> No <input type="checkbox"/>	Notes:

Materials needed

Check the following boxes and explain how materials are used.

<i>Description of materials used:</i>		
<input type="checkbox"/>	Computer(s)	Notes:
<input type="checkbox"/>	Specific website(s)	Notes:
<input type="checkbox"/>	Hands-on activities	Notes:
<input type="checkbox"/>	Other	Notes: