Protocol for the Analysis and Use of Science Assessment Tasks

Step 1: Targeted Outcomes

Task:
_____

1. Read through the task and support materials (content/performance standards, teacher guide, etc.)
2. Circle the type of assessment: pre-assessment, ongoing assessment, culminating assessment.
3. For each question, performance, or product required by the task, describe what you would expect to see in the student work if the student was successful in the task.
4. Determine the balance of cognitive complexity for the task as a whole. For each question, performance, or product, identify the level of cognitive complexity according to Webb's Depth of Knowledge Levels. Put the number of the question in the box under the appropriate category. A couple of examples of each category are provided.

Level 1: Recall	Level 2: Skills and Concepts	Level 3: Strategic Thinking	Level 4: Extended Thinking
* Gather Information.	* Display data; compare data, read a graph.	* Cite evidence and develop a logical argument. Draw conclusions.	* Develop generalizations and apply them to new problem situations
* Recall vocabulary, facts.	* Specify and explain the relationship between facts, terms, properties, or variables.	* Develop a scientific model for a complex situation	* Conduct an investigation, from specifying a problem to designing and carrying out an experiment, to analyzing its data and forming conclusions
* Apply a recipe like procedure.	* Select a procedure according to specified criteria and perform it.	* Identify research questions and design investigations for a scientific problem	
Question Numbers:	Question Numbers:	Question Numbers:	Question Numbers:

5. Using your responses to # 3 and #4 along with appropriate science standards resources **(VT Framework, National Science Standar ds, AAAS Benchmarks, Local Science Curriculum, etc.)** Identify or review the standards and benchmarks that have been identified as having potential to be elicited by the task. Which of the standards and benchmarks or parts of standards and benchmarks do you think will be *most strongly elicited* given the activity and the product and/or performances expected?

6. What other *pre-requisite skills and knowledge* do students need to be successful with this task?

7. **Quality of assessment**:
    a. Task elicits important "core" science concept understandings:　High – Medium – Low
    b. Task elicits important inquiry skills and understandings:　　　High – Medium – Low
    c. Informative to teacher:　　　　　　　　　　　　　　　　　High – Medium – Low
    d. Informative to student:　　　　　　　　　　　　　　　　High – Medium – Low
    e. Engaging to student:　　　　　　　　　　　　　　　　　High – Medium – Low

> *Informative*: Provides student and teacher with the clear direction on how to improve.

8. Review the Scoring Guide. Indicate any recommended changes/additions to the task or the scoring guide that you feel are necessary to strengthen the task. Please provide reasons for the changes based upon evidence from Step 1.
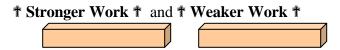
Step 2: Examining Student Work

Identifying the evidence

a. Individually, read through all the samples of student work. Sort the work into two piles:

The goal of a, b, and c is to identify the range of work, not to categorize students.

✝ **Stronger Work** ✝ and ✝ **Weaker Work** ✝

b. Regroup and briefly share overall impressions of the student work related to the targeted skills and concepts of the task. (Number 5 and 6 from Step 1)

c. Sort the two piles into three piles.   ✝ **Strong** ✝   ✝ **Medium** ✝   ✝ **Weak** ✝

d. Start with the student work that you rated as strong. For each response, performance, or product:

Key Question:
Why did I put this student's answer at the "strong" level of understanding?

* Identify the criteria in the scoring guide and in the standards for which the student answer provides evidence of understanding.
* Highlight the evidence in the student work that supports the level of performance (Strong)
* Consider the criteria in the standards, scoring guide, and the highlighted evidence. On a sticky note, justify why you placed the student response in the "Strong" level of performance.
* Record the score level/points from the scoring guide on the sticky note.

Sticky Note Color Code ⟶   **Strong**: *Yellow*   **Medium**: *Pink*   **Weak**: *Green*

e. In pairs, share your work from section "d". Discuss your reasoning with your partner.

f. In the table provided on the Evidence Sheets (sample below), identify a student response that can serve as an example of a "**benchmark for strong work."** A "benchmark" response must clearly illustrate the level of performance based on the criteria in the standards and the scoring guide. On the right hand side of the sheet, write an annotation "justification" for the benchmark. Record a benchmark and annotation for each question or task.

g. Repeat the process for "Medium" and "Weak" levels of performance.

Question/Student ID	Evidence in Student Work: "Strong"
Question/Student ID	Evidence in Student Work: "Medium"
Question/Student ID	Evidence in Student Work: " Weak"

Evidence Sheet   **Task:** _____

Question/Student ID	Evidence in Student Work: "Strong"

Question/Student ID	Evidence in Student Work: "Medium"

Question/Student ID	Evidence in Student Work: "Weak"

Step 3: Action Planning   **Student:** _____

Task: _____   **Date:** _____

Instructional Link For Students
Use the student work; your sticky notes from Step 2 and the Benchmark student responses that you and your partner recorded to reflect on the questions in the table below. You might choose to determine instruction links for all your students or you may choose to focus on a particular group such as the students you identified as producing "Weak" work.

1. Based on the evidence in the work, what strengths does the student bring to this task?	2. Based on the evidence in the work, what ideas, concepts, skills seem to be keeping him/her from meeting the expectations of the task?	3. Based on the evidence in the task, what is a productive "next step" for this student?

Step 3: Action Planning

Task: _____ **Date:** _____

Instructional Link For Teachers
The purpose of this section is to reflect on the evidence of student performance for the class and identify implications for instruction and continuous assessment in the classroom. Are there patterns in the student responses that indicate a need for additional instruction or a change in instruction?

Based on the evidence in the work, what possible additional instruction would students need to be more successful in meeting the expectations of the task?	
Evidence	**Types of Change/Revision/New Strategies**