**Summary Description of Assessment #1**

Formulating a Scientifically Testable Question

**Competency:**

* Student can formulate a scientifically testable question(s) that relates to the context or data provided.

**Focus:**

🞎 Declarative knowledge

🗹 Procedural knowledge

🞎 Problem solving

**Evidence of Competency:** Students are provided a short list of variables that are related to a scientific topic or concept with which the students are familiar. The variables are listed without reference to how they could be observed, measured, or quantified. Students are asked to create and write down a scientifically testable research question that relates two of these variables in some way. To facilitate scoring, students also are asked to explain how each variable could be observed or measured. A student’s performance is scored with respect to whether a scientifically testable question is provided that relates two of the listed variables.

**All assessments developed using this template should be fully consistent with its corresponding specification. The most up-to-date specification for this template can be found at http://www.cala.fsu.edu/ies/performance\_  
assessment\_specifications.**

**Performance Assessment #1**

Formulating Scientifically Testable  
Questions Related to \_\_\_\_\_\_\_\_\_\_\_\_

Taskstudents are asked to perform:

Students will develop a scientifically testable question related to \_\_\_\_\_\_\_\_.

Variables presented to students are

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

First, students will select and write down two variables from the list that they think might be related. Students should only choose variables that they (or another scientist) could actually observe or measure scientifically.

Next, students will explain why the two variables they chose can be studied scientifically. To do this, students will explain how each variable could be observed or measured (i.e., provide an operational definition).

Finally, students will write a scientifically testable questionthat relates their two chosen variablesto each other.

Related prior knowledge or skillsstudents must have:

Students must be familiar with the variables related to \_\_\_\_\_\_\_\_\_ that are provided above.

Required materials and resources:

Written instruction provided in Appendix A.

Instruction given student:

See *Written Instructions for Students* (Appendix A).

Guidelinesthat influence administering this performance assessment when used summatively:

Clarification of the [*6–8*] variables related to \_\_\_\_\_\_\_\_ should not provide information that influences the variables a student selects or the student’s eventual phrasing of the research question.

Scoring Planfor this performance assessment:

Regarding all scoring plans, partial credit is never awarded for any items within the scoring plan, even when multiple points are involved. Credit is to be awarded in full or not at all.

Grammar, spelling, or other factors not directly related to the competency being assessed are not reflected in the scoring plan. Using professional judgment, however, you are encouraged to provide students feedback on these additional factors that are not assigned points in this scoring plan.

To create a scientifically testable question, students must use variables that can be objectively quantified. When a student selects from the following **MORE objective** variables, use the scoring procedure that is **below on the left side**.

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

However, if a student selects less objective variable(s), full credit is given only *if* the student also describes a specific process that objectively and appropriately quantifies observations. When a student selects from the following **LESS objective** variables, use the scoring procedure that is **below on the right side**.

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**1st Variable**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **MORE Objective Variable Selected**   |  |  | | --- | --- | | (Student receives one point for selecting a more objective variable.) | 1 | | It is obvious from the student’s explanation that the student recognizes this variable can be directly observed. | 2 | | **LESS Objective Variable Selected**   |  |  | | --- | --- | | Student describes a specific process to quantify observations of the variable that clearly is both objective and appropriate. | 3 | |

**2nd Variable**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **MORE Objective Variable Selected**   |  |  | | --- | --- | | (Student receives one point for selecting a more objective variable.) | 1 | | It is obvious from the student’s explanation that the student recognizes this variable can be directly observed. | 2 | | **LESS Objective Variable Selected**   |  |  | | --- | --- | | Student describes a specific process to quantify observations of the variable that clearly is both objective and appropriate. | 3 | |

(Scoring plan continued on next page)

**Question Characteristics**

|  |  |
| --- | --- |
| Statement phrased as a question. | 1 |
| Question references the two variables that the student previously listed, AND NO OTHERS. | 1 |
| Question implies a relationship (causal or correlational) between the two listed variables. | 1 |

Appendix A

Written Instructions for Students

Formulating Scientifically Testable

Questions Related to \_\_\_\_\_\_\_\_\_\_

In this exercise, you will **create a** **scientifically testable question** related to \_\_\_\_\_\_\_\_\_\_  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Use two of the following [*6–8*] variables when you create your scientifically testable question:

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Choose two variables from the list above** that you think might have a relationship with one another. Be careful about which two variables you choose. Only pick variables you (or another scientist) could actually observe or measure scientifically. Write those two variables in the space below.

1st variable:

2nd variable:

1. For each of the two variables you chose, tell why it is possible to study the variable. To do this, **explain how each variable could be observed or measured**.

Explain how your 1st variable could be observed or measured:

Explain how your 2nd variable could be observed or measured:

1. In the space below, **write a** **scientifically testable question** that relates your two variablesto each other.