HOW TO DESIGN

QUESTIONS AND TASKS

TO ASSESS STUDENT THINKING

SUSAN M. BROOKHART

Hawker Brownlow
EDUCATION

HOW TO DESIGN

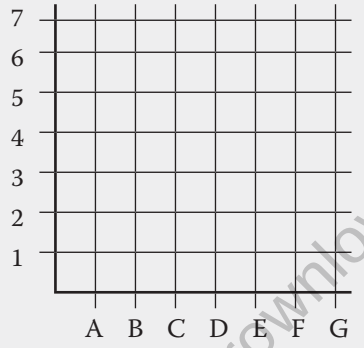
QUESTIONS AND TASKS

TO ASSESS STUDENT THINKING

Examples in Math and Science

Let's walk through a couple of examples of simple performance tasks to demonstrate how useful this process can be for understanding just what an assessment task is able to show about what students know and can do. Let's start with the following math task.

On the grid below, plot the points with coordinates (B, 1), (B, 3), and (B, 4).



Plot three more points on the grid so that when you connect all six points you will have a rectangle. List the coordinates for the three new points. ____ ____ ____

Connect the six points to show your rectangle. Explain how you decided where to put your three points. _____

Source: National Assessment of Educational Progress (NAEP) released items: 2009, grade 4, block M10, question #16. Adapted to allow for more than one correct answer.

Approaching this mathematics performance assessment from the student's point of view, we might come up with something like this: *What is this problem asking me to do? First, I must plot points. That means I must know what ordered pairs are and how to plot them on a grid. Then, I must decide on three more points that, with the three I already have, will make a rectangle, plot them, and connect them. Therefore, I must also know what a rectangle is and how to decide whether I have made one. Finally, I must explain my reasoning, which means I must be able to communicate my mathematical ideas in words as well as points on a grid.*

thinking as well. A real advantage of multiple-choice items is that you can assess higher-order thinking and still assess a broader range of content than you can with essay test items or performance assessments, because a student can complete many multiple-choice items in the time it takes to write one essay or do a performance assessment task.

To give you a preview of how this works, let's compare two multiple-choice items. The first one assesses recall of a fact in literature.

In E. B. White's essay "Twins," which character gives birth to twins?

A. The speaker's mother
B. A cow moose
C. A red deer
D. A shoe clerk

The second example is a multiple-choice item that assesses higher-order thinking in the same content area.

The following is from the first paragraph of the essay "Twins."

They stood there, mother and child, under a gray beech whose trunk was engraved with dozens of hearts and initials.

What does the sentence imply?

A. E. B. White is sympathetic to parents and children.
B. The deer were hiding from E. B. White and the other sightseers.
C. E. B. White is aware of both nature and the urban setting.
D. The graffiti interferes with E. B. White's enjoyment of the scene.

Source: National Assessment of Educational Progress (NAEP) released items: 2011, grade 8, block R2, question #8.

The student would need to know the same fact—which character gives birth to twins—in order to respond to this question, but she would also need to think about

how a character in a story they had read developed over the course of the narrative; that is, the task definition was very structured. Wanting to add some student choice into the mix, the teacher allowed students to decide among six different methods for their final product. They could write a poem, conduct a presentation with slides, write a song or rap, prepare a brochure, make a poster, or write an essay. Although the method of presenting the final product was guided but still relatively unstructured, that openness didn't really relate to the students' thinking about the character analysis. The choice was independent of the purpose of the assignment itself, based on student preference.

What if the teacher had asked the students to do the character analysis and then present the results in the way they thought the character might? For example, she might have given students choices such as writing a self-reflective letter to another character in the story, or writing a posting for Facebook expressing himself to his friends and followers, or composing a skit consisting of dialogue between the character and another character in the story right after the story ended. Then the choices students made about the final product would also have provided windows into their thinking about the content—in this case, the character.

Let's walk through some examples in several different disciplines, exploring how varying task structure allows you to control the kind of thinking students must do to complete the task.

An Example in Science

The following example is a sample performance assessment intended for use at the upper-elementary or middle school level. This performance assessment addresses several aspects of the Next Generation Science Standards (NRC, 2012), including

- Disciplinary Core Idea PS1.A: Structure and Properties of Matter.
- Science Process Standards 3 and 4: Planning and carrying out investigations; analyzing and interpreting data.
- Crosscutting Concepts: Energy and Matter.

It also addresses a Common Core reading standard:

9 An Idea Bank of Performance Assessment Tasks

In this chapter, I have created an idea bank of sorts by assembling some suggestions for how to write performance tasks that tap higher-order thinking in various disciplines. Each bullet item is a separate suggestion, and I have grouped them into categories.

I provide this idea bank with great trepidation, because resources like this can easily be used as "cookbooks." It won't do to simply grab a template from the list below and plug in your topic of the day. Good design of performance tasks requires all the steps outlined in preceding chapters, and it starts with defining what you want to assess. Good design does *not* start with identifying an interesting activity from a list like the ones in this chapter.

However, I have decided to include this idea bank because many teachers find such suggestions helpful. For some, the step between knowing what they want to assess and actually writing the task is a large one. So let's make a deal. I'll present the idea bank to help people who need ideas about how to write, and you, the reader, will promise to use it thoughtfully and always start from your intended learning outcome, *not* any suggestion in these lists, when you are designing a performance assessment task. Use the idea bank to help you brainstorm tasks that match the content knowledge and skills and the higher-order thinking skills you

This protocol originated with the Education Trust. Easton (2009) modified it and included an assessment of the rigor of the assignment. I have modified it further, adding or modifying questions about cognitive level, task structure, and difficulty in order to match the framework for creating tasks presented in this book.

Standards in Practice Protocol

Overview: This protocol can be used to assess assignments, assessment prompts, and instructional tasks. Presenters present and explain an assignment, an assessment, or a task. Then participants discuss the task according to the protocol; this discussion serves as feedback to the presenter. The presenter reflects, and the group debriefs.

Number of Participants: 6 to 8, plus facilitator and presenter

Steps (times based on a 60-minute session)

Step 1: Choosing the Assignment (preparation for session)

Step 2: Presenting the Assignment (5 minutes)

- The presenter can present as much context for the assignment as she wants, but the assignment should stand on its own for examination.
- The presenter may also want to explain how the assignment fits within the context of a unit and of the class.

Step 3: Trying the Assignment (5 minutes, more if time allows)

- Presenter steps outside the process at this point, taking notes but not participating.
- Participants try the assignment themselves, if possible with the time, space, and materials provided; if not, they should "rehearse" the assignment by imagining the steps students would take.

Step 4: Analyzing the Assignment (10 minutes)

- Participants brainstorm what the assignment requires of students. They might assess the following characteristics, known collectively as KASAB (Killion, 2007):