

Planning Questions for Student Assessment Interview

Purpose:

In order to plan effective instruction, you will need to know how to assess your students' knowledge of particular mathematics concepts. One way to assess students' thinking is in an interview setting. This assignment will give you some experience in identifying key concepts and skills for a particular topic and in designing an interview to assess those concepts and skills. This assignment will be followed by the **Report of the Student Assessment** in which you will describe the outcome of the interview and suggest an instructional program for the student.

Description:

Developing the Assessment

- 1) Select a mathematics topic for a certain grade level. Your topic should be either early number concepts or addition/subtraction or multiplication/division.
- 2) Research the topic you selected. Try to find information both about **(a) the content of that topic and (b) children's thinking related to that topic**. You may also read articles on assessment and questioning techniques (e.g., "Using Student Interviews to Guide Classroom Instruction: an Action Research Project" by Larry Buschman, *Teaching Children Mathematics*, Dec. 2001, pp. 222-227).

Find, read, and make use of resources beyond the your methods class textbooks.

Possible resources include:

math content books for elementary teachers
elementary school textbooks
professional journals like *Arithmetic Teacher* or *Teaching Children Mathematics* or *Mathematics Teaching in the Middle School*

- 3) Define in 2-4 sentences what specific concept(s) you will be assessing. The interview should be 30 to 40 minutes in length. You need to narrow the topic. For example, one thing you may want to assess is whether a student is able to solve one of the three types of subtraction situations at the real-world, concrete, symbolic, and levels. This statement is much more focused than stating that you want to know if the student understands subtraction. Remember to be specific in stating the concepts that you are going to assess.
- 4) Develop appropriate problems and/or tasks that will help you understand a student's thinking about your topic. The problems should be sequenced to discover a student's informal knowledge about a topic (e.g., real life contexts that a student might have already encountered) and then the more formal, or abstract knowledge (e.g., the use of symbols and algorithms). Work the problems yourself and try to anticipate multiple ways a child might solve the problems.

Prepare approximately seven to ten problem sets. *Indicate the problem type (specific mathematics topic) of each set.*

- a. Each problem set is composed of a base problem and two problems for adjusting difficulty, an easier problem and a more difficult problem.
- b. Use the same problem type for the three problems in each set.
- c. Use one context for the base problem and a second context for the easier and difficult problems in the set.

Include possible questions that you will ask to follow up on the student's response. Here are some suggestions.

Consistently use probes such as "Why?", "How did you figure that out?", "Why is that important?" "Why did you do that?", "How do you know?", "How come?" Experiment with cultivating an open and neutral tone of voice that makes you sound interested, not challenging.

If the student says something like "I just guessed." or "I just knew." ask, "Why does that answer make sense to you?" A further probe might be to ask if another answer, which is clearly wrong but not too outrageous, would make a sensible "guess."

Experiment with avoiding validating the student's responses by saying, "That's right," or "Good!" If you are feeling pulled to say something of this kind, try, "That's interesting." If the child looks to you or asks directly for confirmation that his or her solution is correct, maintain a neutral demeanor and ask, "Does it make sense to you? Why?" Being neutral does not mean to be mean or cold--you can seem supportive and interested without conveying what you think about the correctness or "goodness" of his or her thinking.

Do not preface or interpret questions with comments like "This is a tough one." or "Here's one about rectangles." If you feel the need to make transitions between questions, try "Let's move one to something else now."

If a student says, "We haven't learned that yet," ask, "Can you figure out a way to do it yourself?"

Sometimes it may be useful to ask, "How would you explain your solution to this problem to the rest of the students in your class?" or "What if someone said _____ (something different from what the student said but plausible)--what would you say to him or her?"

Consider the following types of problems or tasks in your interview.

- a warm-up problem or task that the student will solve successfully
- a successful problem or task to end the interview
- alternative problems, in the event that your problems are too easy or too difficult for the student

Remember, all the problems should be related to the topic you are assessing.

Encourage writing and drawing. Try to make very careful notes as the child is working that describe what he or she is doing, what he or she writes down in conjunction with what he or she says.

Tape record the interview. Be sure to record on paper anything that will not be picked up on the tape recording (e.g., any use of manipulatives). Keep any papers the student used to solve the problem; they may be useful to you as you analyze a student's responses.

5) Write up the assessment interview preparation using this format:

- A. GRADE LEVEL
- B. OVERALL TOPIC
- C. **SPECIFIC CONCEPTS** TO BE ASSESSED
- D. MATERIALS
- E. PROBLEMS AND FOLLOW QUESTIONS
- F. POSSIBLE MODIFICATIONS
- G. REFERENCES YOU UTILIZED