Mathematics in the School: Observation Report #1
Due September 18, 2007

These observations and questions are designed to help you learn about the role of mathematics in the school. This initial impression may change during your stay in the school, but think of this as what parents and other visitors may see on a first visit.

Observations:
1. As you enter the school, look around the office and hallways. Are there any indications that children are involved in mathematics? Look for children’s work and mathematics artifacts such as a number line or problem of the week. Compare/contrast the emphasis given to mathematics to the emphasis given to language arts, visual arts, science or other subject areas.
2. Glance in several classrooms. Do you observe mathematics (e.g. posters, student work) on display? Do you observe mathematics materials around the rooms? Describe the grade levels you observed and what you saw.

Questions:
1. Ask a teacher, the principal, or the assistant principal about the role of mathematics in the school. Do they have special activities (math fair, family math nights, teams, or contests) for mathematics? Do they have a set amount of time for mathematics instruction at each grade level? Do they have any special initiatives focused on mathematics? Are there mathematics resource materials available for teachers to use? Where are they housed? How are they shared?
2. Ask your cooperating teacher the same questions as in #1 above with the focus on his or her classroom. How does the amount of time allotted for mathematics compare with other subjects?

Written Report
From what you saw and asked, what is the environment of the school in terms of mathematics? Please describe your impressions in a 1-2 page single-spaced report.

Rubric

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Expectations</th>
<th>Points Awarded (Possible Points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations</td>
<td>1. The observations include descriptions of mathematics artifacts noticed in the school office, hallways, and classrooms.</td>
<td>____ (2)</td>
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<tr>
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<td>2. The observations include descriptions of mathematics materials and student work.</td>
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<td></td>
<td>3. The observations include a comparison of the emphasis of mathematics to language arts and/or other content areas.</td>
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<tr>
<td>Interviews</td>
<td>1. The report gives information about who was interviewed.</td>
<td>____ (2)</td>
</tr>
<tr>
<td></td>
<td>2. The report describes information given in the interviews about school mathematics events, time allotted for mathematics instruction, and mathematics resource materials.</td>
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</tr>
<tr>
<td>Reflections</td>
<td>1. The report includes student’s impressions of the school in terms of mathematics.</td>
<td>____ (1)</td>
</tr>
<tr>
<td></td>
<td>2. The report includes student’s general reaction to the mathematics environment described in the report.</td>
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<tr>
<td>Total Points</td>
<td></td>
<td>____ (5)</td>
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Mathematics Lesson: Observation Report #2
Due September 25, 2007

This observation assignment was developed to help you learn about the instructional design of a mathematics lesson. Please review the lesson plan on p. 54 of the Reys book before completing the assignment. Your report should be approximately 1-2 single-spaced pages.

General Description of the Lesson
1. Would you say this was an investigative, direct instruction, or exploration lesson?
2. What was the mathematics content focus of the lesson?
3. What materials were used in the lesson?
4. How long was the lesson? How many students were involved? At what grade level?
5. Was the instruction whole class, small groups, or individual?
6. Did you notice any differentiation or assessment being done? Describe it.

Lesson Outline
1. Describe the launch of the lesson. How did the teacher begin the lesson? How did he/she get students motivated to learn? How did he/she introduce the mathematics content?
2. Describe the investigation, instruction, or exploration.
   a. Investigation – What was the problem the students were asked to solve? What did the students do during this part of the lesson? What did the teacher do? What questions did the teacher ask?
   b. Direct instruction – What concepts, definitions, or algorithms did the teacher explain or model? What were the students doing during this part of the lesson? How did the students practice the concepts taught? What did the teacher do while students were practicing? What questions did the teacher ask?
   c. Exploration – How was the exploration organized? What content was taught or reviewed at the different learning stations? What did you observe students doing during this time? What was the teacher doing? Did each exploration include a launch, explore, and summarize phase?
3. Describe the summary. How did the teacher bring the lesson to a close? How were the students asked to reflect upon their learning? Did the teacher give a preview of what was going to happen during the next lesson?

Reflection
1. Do you think this lesson was effective? Tell why or why not.
2. If you were the teacher, would you have done anything differently? What?
3. What did you learn from observing this lesson?
Rubric for Observation Report #2

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Expectations</th>
<th>Points Awarded (Points Possible)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Description Of the Lesson</strong></td>
<td>The general description of the lesson includes: 1. information about the type of lesson observed (investigative, direct instruction, exploration); 2. the grade level, mathematics content focus, materials used, length of lesson, and the number of students involved; 3. information about student grouping during instruction; and 4. information about differentiation and/or assessment observed.</td>
<td>_____ (1)</td>
</tr>
<tr>
<td><strong>Lesson Outline</strong></td>
<td>The lesson outline describes: 1. the launch; 2. the investigation, direction instruction, or the exploration; and 3. the lesson summary.</td>
<td>_____ (2)</td>
</tr>
<tr>
<td><strong>Reflection</strong></td>
<td>The report includes student’s reflections on: 1. general impressions and effectiveness of the lesson; 2. what could have been done differently and why; and 3. new insights or learning.</td>
<td>_____ (2)</td>
</tr>
</tbody>
</table>
Lesson Plan Summary
Due October 23, November 6, and December 4

This assignment is to help you gain practical experience teaching mathematics to elementary students. You will teach three mathematics lessons this semester. One of your lessons may be taught to a small group of students. At least two of the lessons should be taught to the whole class.

Your Clinical Teacher will write up just one formal observation of your teaching (see attached form). You can have her/him observe any one of your three lessons.

You may use the lesson plan format in Reys pg 54 or the GMU Lesson Plan Format. Please be sure to include all parts of the lesson listed in the rubric on the following page. It is strongly recommended that you integrate manipulatives, literature, and technology into your lessons. The lesson plan must be typed.
Grading Rubric for Lesson Plan Summary

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Expectations</th>
<th>Points Awarded (Points Possible)</th>
</tr>
</thead>
</table>
| Objectives     | 1. The objectives clearly state what students will do during the lesson.  
2. The objectives clearly state the mathematics content/essential understandings of the lesson.  
3. The objectives are tied to state/national standards.                                                                                   | ____ (1)                         |
| Materials      | 1. A list of materials used during the lesson is provided.  
2. Copies of any handouts or worksheets used during the lesson are included.  
3. The lesson integrates the use of mathematics tools (manipulatives, calculators, computers) and/or representations (concrete, pictorial, symbolic).  
4. Appropriate materials are selected for the concepts being taught.  
5. The lesson does not overuse worksheets.                                                                                            | ____ (1)                         |
| Procedure      | 1. The lesson is substantive in length, breadth, and depth.  
2. The procedures thoroughly and completely outline what the teacher will do during the lesson. How did you present the lesson?  
3. The procedures thoroughly and completely outline what the students will do during the lesson.  
4. The procedures show that students are engaged in doing mathematics.  
5. Estimated times for each phase are provided in parentheses.  
6. The procedures are in a bulleted list.  
7. The procedures provide enough detail to allow another person to teach the lesson.  
8. Any questions or mathematics content the teacher uses during the lesson are included.  
9. The procedures include an introduction for activating prior knowledge.  
10. The procedures include a plan for closing the lesson.                                                                                  | ____ (3)                         |
| Differentiation| 1. A list of adaptations for individual students is included.  
2. Specific information must be provided on individual students in the class and the accommodations made for those children. (General comments are not appropriate for this requirement.)                      | ____ (1)                         |
| Assessment     | 1. The assessment is tied to the lesson objectives.  
2. The assessment is described in enough detail that another person could conduct the assessment.  
3. The assessment describes what the teacher does to assess the students.  
4. The assessment describes anticipated student responses. What will students do to demonstrate their understanding of the mathematics? What student misconceptions do you predict? | ____ (1)                         |
| Work Samples   | 1. An example of the assessment conducted during the lesson is attached to provide documentation of what students did during the lesson (i.e., written work, drawings, worksheets, photographs, checklists, anecdotal records). | ____ (1)                         |
| Reflection     | 1. The reflection is ½-1 pages in length.  
2. The reflection describes the mathematics teaching and learning that occurred during the lesson and how it related to the lesson plan prepared ahead of time.  
3. The reflection discusses those elements of the lesson that went well and those that did not.  
4. The reflection discusses at least three changes or improvements that you would make to the lesson if you were teaching it again.  
5. The reflection identifies one important idea you learned about teaching and learning mathematics. (Ideas that focus on behavior management strategies are not acceptable for this requirement.)  
6. The reflection identifies one important teaching skill you plan to work on the next time you teach a mathematics lesson. | ____ (2)                         |
|                |                                                                                                                                             | Total Points ____ (10)             |
Observation form for GMU teacher interns

Evaluator: ____________________________  Intern’s name: ____________________________
School: _______________________________  Date: ___________________________________
Lesson: _______________________________  Grade Level: ____________________________

Preparation and planning:

Instructional method and management:

Assessment and Differentiation:

Professionalism:

Recommendations:

Observer’s signature: ____________________________

Intern’s Signature: ____________________________
Student Assessment PLAN

The Child:
Describe the child you plan to assess. Include information you gathered about the child (grade level, age, gender, race, and academic ability level). What do you know about the child’s level of understanding about the topic before the assessment?

The Mathematics Concept:
Select one specific mathematics concept to assess during the assessment. Examples of concepts might include patterns, sorting, addition of whole numbers, division of fractions, finding averages, percent, geometric shapes, or length measurement. Tell why this concept is appropriate for this child at this particular grade level.

Different Forms of Representation:
During the assessment, assess the child using three different forms of representation. Identify the three different forms of representation you will use during the assessment with at least one example in each form. Concrete representations include manipulatives, measuring tools, or other objects the child can manipulate during the assessment. Pictorial representations include drawings, diagrams, charts, or graphs that are drawn by the child or are provided for the child to read and interpret. Symbolic representations include numbers or letters the child writes or interprets to demonstrate understanding of a task.

Tasks & Questions:
Design tasks and questions that use three different forms of representation (concrete, pictorial, abstract symbols) to diagnose the child’s understanding of ONE basic concept. Go beyond the basic level of determining the child’s factual knowledge of the concept by asking questions that determine how much the child understands about the concept. For example, suppose you are assessing the concept of ADDITION. (1) Create several tasks where the child uses concrete manipulatives to demonstrate her understanding of addition; ask questions about the child’s understanding of the addition tasks with manipulatives. (2) Create several tasks where the child is asked to create or interpret drawings to demonstrate her understanding of addition; ask questions about the child’s understanding of these tasks with pictorial models; (3) Create several tasks where the child uses abstract symbols (and letters) to demonstrate her understanding of addition; ask questions about the child’s understanding of these addition tasks using the symbols.

The plan should be typed.
Individual Student Assessment Guidelines  
(Performance Based Assessment for the Course)  
REPORT

Student Work Samples:
Collect and document three different forms of representation (concrete, pictorial, abstract symbols) during the assessment to elicit the child’s level of understanding. The report must include samples of the child’s computations, writings and drawings, as well as a description of how the child used concrete objects during the assessment or photographs of the child’s work.

Question & Response Assessment Transcript:
Audiotape the assessment. (Be sure to ask the child’s teacher and parent for permission.) Type a basic transcript of the assessment from the audio recording. Type only those questions and responses that pertain to mathematics. Be sure to include your questions and the child’s responses. Indicate what you said and what the child said by using T for you (the teacher) and C for the child.

Questioning Competence:
The questions and follow-up questions that you use during the assessment will be evaluated. You will be evaluated on the quality and the types of follow-up questions you use during your interaction with the child. Your textbooks and readings provide direction on the types of questions that are appropriate in an assessment and that go beyond factual information to deeper understanding.

Evaluation of Child’s Mathematical Knowledge:
Write an evaluation of the child’s mathematical knowledge in the content area. Use evidence from the assessment to support your conclusions. Use your textbook to help you describe the specific types of behaviors and verbalizations you observed using specific mathematical terms. For example, if you conclude that the student has an understanding of addition of fractions with like denominators, you should base this on evidence that you present that shows the child was able to represent \(\frac{3}{5}\) and \(\frac{4}{5}\) with fraction pieces (concrete), and/or the child used a drawing to find the sum (pictorial), and/or the child computed the answer with symbols (abstract). Give specific examples of the child’s responses to support your statements.

Instructional Plan:
Develop a suggested instructional plan for the child. Your assessment of the child’s thinking should give you some information for planning instruction. Your suggestions should be based on what you learned about the child during the assessment. Many general suggestions can be valuable for children. However, your recommendations should relate to specifics. For example, if you assessed basic division concepts and you suggest that the instructional plan for the child should include more manipulatives, that would be an important teaching strategy, but it would be too general. You should be more specific about why and how manipulatives might be used. Example: “The student had difficulty making 3 equal groups from a set of 21 chips; therefore, the student should be given more experiences with grouping and partitioning manipulatives in sets of 15 to 30 to develop both the measurement and partitive concepts of division.”

Reflection of the Assessment Process:
Comment on the assessment process. How long did the assessment last? What did you learn about assessment techniques? What did you learn about your ability to create mathematics questions and tasks for this concept? If you were to conduct the assessment with another child, would there be any changes in your questions, either the order or the level of difficulty, or the materials you had available for the child to use? Why or why not? What have you learned about how children learn mathematics from this assessment? How might a classroom teacher use the diagnostic mathematics assessment to assess children?

The report should be typed.
RUBRIC FOR ASSESSMENT REPORT

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Exceeds Requirements (A)</th>
<th>Meets Requirements (A-,B+).B</th>
<th>Needs Improvement (C)</th>
<th>Inc.</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the required information present about the child assessed?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Has the teacher selected one specific mathematics concept and assessed the concept using three different forms of representation (concrete, pictorial, abstract)?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Do the tasks and questions match the specific mathematics concept being assessed? Is there variety in the tasks and questions used for each of the three different forms of representation?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Are the child’s work samples included with three different forms of representation present in the work samples?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Is the required question and response assessment transcript present?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Do the initial and follow-up questions used by the teacher demonstrate variety and higher levels of questioning? Are specific follow-up questions used appropriately?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Does the evaluation accurately represent the child’s current level of understanding on this concept using supporting evidence and work samples from the assessment?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Does the instructional plan prescribe developmentally appropriate next steps for instruction and take into account the child’s current level of understanding on this concept?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Is there an appropriate reflection and evaluation of the assessment process?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
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<tr>
<td>TOTAL SCORE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>5.0 – 4.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-</td>
<td>4.49 – 3.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>B+</td>
<td>3.49 – 2.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>2.49 – 2.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1.99 – 1.0</td>
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<tr>
<td>Unsatisfactory</td>
<td>0.99 or below</td>
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</tbody>
</table>

B+ 3.49 – 2.5
C 1.99 – 1.0
A 5.0 – 4.5
A- 4.49 – 3.5
B 2.49 – 2.0
C 1.99 – 1.0
Unsatisfactory 0.99 or below

The transcript shows that during the assessment, the teacher used a variety of higher-level questions to encourage deeper thinking and appropriate follow-up questions to probe for understanding.

The evaluation provides a detailed description of the child’s current level of understanding on the concept. Many different and specific examples from the assessment are given, including the child’s quotations, student work, and information from other sources on math development, to provide supporting evidence for the evaluation of the child.

The instructional plan describes developmentally appropriate next steps for instruction. The plan identifies several specific examples of tasks that would be appropriate to further enhance this child’s understanding on the concept. The plan describes these tasks in relation to the child’s current level of understanding.

The Report includes a reflection and evaluation on the assessment process including the required elements.