

Student Artifacts EDU 5355 – 2012 Teaching Portfolio Entry

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Assignment 1: Child Interview Study

The Assignment: *For this individual project, you will be responsible for administering two scripted problem-solving interviews to a child in grades K-5. This can be a child you work with, a child you're related to, a child whose parents you're friends with, etc. However, you MUST have parental consent for the interview. The interview problems and prompts will all be provided to you in an electronic packet, as will any manipulatives the interview requires. You will select 2 of the following topics to interview the child about: Addition & Subtraction, Base 10 Concepts, Multidigit Operations, Fractions, Measurement, Geometry, Algebra. You will be responsible for either taking detailed notes or audio/video recording the interview, and you must collect the child's written work. You will use your recording/notes and the written work to determine what the child understands about each topic, and classify their understanding according to the assigned readings and class notes and discussions. You will write a report on your findings (rubric included). You will make a presentation about your report to the class.*

Below is an excerpt from one of my students' reports – this is the end of her report where she is reflecting on the experience:

I learned an invaluable amount from doing these interviews. Everything we have been learning and discussing this semester was presented to me in a real-life situation. I feel like the activities were all presented accurately and that they overall went very well. The best part was that I feel like I got all the information I needed. The questions I asked as prompts worked very well. On the other hand, it was sometimes hard to think of a question with the correct wording at and the same time try to figure out what the student had just done. It sometimes took me a while to ask a prompting question and I feel like the student's focus may have been affected by the amount of wait time.

From this interview I learned where the student was in her mathematical reasoning and skills. I learned that this student has been taught to explain what she does when solving math problems because she never had issues in describing to me her methods and processes. The student had the skills to do the activities and if she keeps working and being taught the way she currently is, she can be very successful in mathematics through problem solving. This type of interview could be incredibly useful in deciding what sort of instruction to give the child. The instructor can see which problem types the student is strong in and which ones she needs help with. The interview can also reveal where the student is in her ability to talk about math, or her willingness to persevere through a struggling problem. The instructor can use all of this information to create personalized instruction for this particular student, or accommodations to whole group math instruction for this student if needed. The problem solving interviews are definitely a tool that classroom teachers could use. They are great for

Present child with two different rectangular shapes, of equal areas and different dimensions (3x4 and 2x6). Make sure that the shapes are cut-out, so that the child can fold, turn, and manipulate as needed. Have scissors available in case the child wants to cut and rearrange either of the shapes.

Jonah and Zelda both have giant brownies. They are trying to figure out whose brownie takes up the most space, to see if they both got the same amount of brownie. Do you think they got the same amount of brownie? Tell why.

Probes:

- ◆ Do they cover the same amount of space?
- ◆ How do you know? How can you be sure?
- ◆ Is there anything else you could do to know for sure?

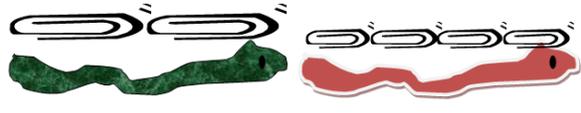
Description/Drawing of how child solves task, language child uses:

Excerpt from interview protocol

assessment at the beginning of the year to see where students are in their problem solving progress. It can also be used as formative assessments to monitor students' progress during the time of instruction.

The student had difficulties with the *equality of measurement* units task. As follow-up activities to help the student better understand this concept, I would use the same snakes and paper clips but align them vertically. I think part of the task misunderstanding was the fact that the snakes were separate and the student did not think to compare them in another way. By putting the snakes on top of each other the student may be able to recognize the inequality. If not, I would possibly the change materials used to measure. To solidify the understanding of the need for equal units I would give the students situations to analyze like "John and Maria want to measure their feet to see who wears a bigger shoe. John measures his with unifix cubes and Maria measures hers with toothpicks. Can they figure out whose is bigger? Why or why not?" This is promoting discussion and show students that units of different size will not give them correct answers. Students like to play the fair game, so using amounts of sweet treats or toys may help them make this connection.

Two friends, Jason and Anna, were comparing their pet snakes. They measured the snakes with paper clips to figure out which snake was longer. Anna measured the Green Snake and figured out it was 2 paper clips long. Jason measured the Red Snake and figured out it was 4 paper clips long. Jason said, "My Red Snake is longer, because it's 4 paper clips long." Jason didn't agree. Who do you think is right?



Overall, the interview was a great learning experience for me as a soon to be teacher. It was insightful to see the problem-solving knowledge in a very young student and how useful it is for the teacher's use. I will definitely use these interviews, or ones similar, to analyze my future students' problem-solving skills and progress.

Assignment 2: Problem-Based Lesson

The Assignment: Student groups will develop an ORIGINAL problem-based investigation that will be taught during our class. This must be a task that matches the “Doing Mathematics” level in the Level of Cognitive Demand framework (Table 3.1, pg. 37). Each group will sign up for a mathematical topic on which the activity will be developed. This problem-solving activity should cover a topic from elementary mathematics, but should be complex/difficult enough to keep students in our class engaged. This project has the following elements (also see rubrics): Lesson Plan, Revised Lesson Plan, Teach, Reflection, Contributions Sheet.

Below is an excerpt from one students’ reflections on teaching their problem-based lesson:

Overall, the decimal, percentage and fraction lesson plan titled “Pennies for Pizza” was a success. While composing the lesson, we did not think it would be challenging enough for the class, however it turned out to fit well. Using the estimation calculators made it more suitable for this class, as the groups were required to estimate calculations instead of simply plugging them in to a regular calculator. While this took more time, without them the activity would have been too simple. The estimating calculators also helped with illustrating how much pizza a person would get as the student would have to estimate how much 16.4% of the pizza was in slices and then draw it. The class

understood the activity as the questions were clear, but they were also challenging and encouraged students to use decimals, percentages and fractions, depending what they felt most comfortable using. While the questions were understandable, we did not provide too much direction so that the students could attack the problem based questions with critical thinking and different methods to solve them.

The lesson plan was a little long for the time allotment. While the class was working through most of the questions, we did run low on time because of the multiple parts of each question. As it was taking longer than expected, we quickly modified the lesson and directed the students to calculate the tax for two of the previous questions (instead of 5) since the same problem was being redundant. If I were to teach this lesson again, I would make the worksheet a little shorter and not require the students to draw out the money manipulatives they were using. However, if this were a younger class, I would have them draw out the money manipulatives to help with consistency and understanding of the money system.

As a teacher, I learned that in some cases you must quickly adapt the lesson to fit the needs of the students and the time, based upon how fast the class is working. During the lesson, I also learned how to give hints to struggling students without explicitly giving them the answer, but instead by asking thought provoking questions that would lead them in the right direction. However, it was difficult to find the right balance between giving the students enough think time instead of jumping in before they have had time to think about the question.

While we initially had some trouble with composing a lesson plan that was problem based, after revising and editing we finally made the lesson more problem based. While our directions were clear, they did not specify the exact process of how to solve the problem. Therefore, the students had to find out how to solve the problem on their own, using their own preferred method. Problem based instruction can be more challenging than direct instruction, but by making the students come up with their own methods and strategies to solve the questions, they grasp a deeper understanding. Problem based lessons also allow for a creative context and problem situation. This activity involved a pizza party and the students actually got to eat pizza, as opposed to just solving a worksheet about percentages. In conclusion, this presentation demonstrated how a problem-based lesson is more engaging for students and can make their understanding of a topic deeper and more meaningful.

Pennies for Pizza

You and your friends are at a party and you're all starving, so you decide to order a pizza! If you have \$7.49 in your pocket, what percent of the pizza could you get in each of the following situations? Assume that everyone wants as much of the pizza as possible. Make sure to show your work. Round decimals to the nearest hundredths position.

HINT: Estimating can be VERY helpful!

1. The pizza costs \$19.99. Illustrate with money manipulatives your total amount of money to buy into the pizza. Find the percentage of the pizza you would receive. What fraction of the pizza is that? (It can be approximate!) Given the total amount of pizza you will receive, draw a picture representation of your portion of the pizza. If the pizza has 12 slices, about how many slices will you get?
2. The pizza costs \$19.99, but you loan John \$2.50 first. Illustrate with money manipulatives your total amount of money to buy into the pizza. Find the percentage of the pizza you would receive. What fraction of the pizza is that? (It can be approximate!) Given the total amount of pizza you will receive, draw a picture representation of your portion of the pizza. If the pizza has 25 slices, about how many slices will you get given your percentage?
3. The pizza costs \$25.20 and your friend Sarah isn't hungry, so she gives you her three dollars, two dimes and two nickels. Illustrate with money manipulatives your total amount of money to buy into the pizza. Find the percentage of the pizza you would receive. What fraction of the pizza is that? (It can be approximate!) Given the total

Assignment 3: Children's Literature Lesson Plan

The Assignment: *Research has shown that children can learn mathematical concepts through language and the manipulation of concrete objects. Combining literature, storytelling, and manipulatives provides students with exciting learning opportunities. Each student, working individually, will prepare a lesson using a children's literature book, appropriate for EC-8, of their choice. See rubrics for more information.*

Below is the text from one of the lesson plans submitted by a student in my class:

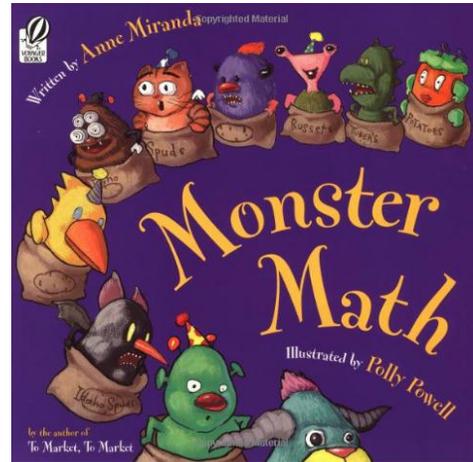
Title: Monster Math

Topic: Basic counting (1-10) and counting by 10s

TEKS: The primary focal areas in Kindergarten are understanding counting and cardinality, understanding addition as joining and subtraction as separating, and comparing objects by measurable [measureable] attributes.

Required Material:

- Monster Math by Anne Miranda
- Colored cotton balls
- Small white boards
- Large teacher white board



Before Phase:

1. I will begin my lesson by having my students on the carpet with their white boards. I will activate students' prior knowledge of book topic starting by saying a number (1-10) and asking the students to write that number on their white boards and holding them in the air when they are done. I will continue and with this activity and change up the activity by asking the students to also act the students to write harder numbers (20, 30, 40, 50).
2. I will establish clear expectations for students' actions while reading the book by going over a list of directions after their white boards are put away and I again have all their attention back on the carpet. I will ask the students if they have ever been to a party. I will also ask them if at that party they had lots of friends. I will then tell the students that we are going to read a book called Monster Math where one little monster is having a birthday party and he and his mother need your help counting all his friends. On each page I will ask the students to count how many monster friends there are and raise their hands to participate.

During Phase:

3. The mathematical ideas in this book although simple are very important for students to master. I will use the idea of monsters at a birthday party to first engage the students, which is critical if they are to retain the skills from the book. Counting the monsters simply at first will help the students review their counting skills. Then when the book moves onto counting by 10s I will guide the students to by giving them hints that each new number 20, 30, 40, 50 is another 10. The students will develop this new idea in an interesting way that will keep them engaged.
4. Questioning the students while reading the book is very important. I will continuously be asking the students how many monsters are on each page and ask them what those monsters are doing to be sure they are listening. Then when moving into the counting by 10s, I will ask the students how many more that number is each time and even ask them what come next.

After Phase:

5. After we have finished the book I will keep the students seated and ask them key questions about the concepts they have just reviewed and learned. I will start by asking them to count for me from 1 to

10. Then I will give them a number from 1 to 10 and ask them what comes before or next. This will make sure that it is not simply a list they have memorized but understand the numbers. For example what is the number before 7... their response would be 6. I would ask for individual answers as well as whole group. I will move onto counting by 10s and have the students count by 10s up to 50. Then do the same as before and ask them what are 10 more than each of the numbers and 10 less. An example would be what is 10 more than 20... The response would be 30.

6. My follow up activity would begin with having students move back to their group tables. In groups of two I would give the students 50 cotton balls of multiple different colors. I would then ask the students together to show me different scenarios. For example: At little monster's birthday party there were 3 red monsters, 5 blue monsters and 8 green monsters. Put the monsters into their color groups. This would have the students count the cotton balls and test their counting abilities. Towards the end I would also have the students count by 10s using the same idea of counting monster party guests. This activity would further their counting ability and develop their ability to count by 10s while giving them visual practice.

