PRACTICUM REPORT – ROUGH DRAFT
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Math 4010
June 29, 2005

The class that I observed for the practicum was Sylvia Coon's fifth grade class at Nibley Park Elementary. Sylvia had a very small class this year which really contributed to the success that each student achieved. The class size on the days that I observed averaged 19. The lessons I observed were at the end of the year and so tended to center around interesting math concepts, rather than basic curriculum. I observed a review lesson on prime numbers where the teacher led the class in working through the Sieve of to find all the prime numbers below one hundred. I also observed a lesson on tangrams and an introduction to base two. Every lesson that I observed incorporated the theories of an integrated curriculum.

The teacher read stories based on the math themes to provide a literature connection, provided opportunities for cooperative learning, hands on activities, and time for interacting and sharing as a class. In fact, during the lesson on the binary system, or base two, the first student to really understand and share with the rest of the class was a resource student. It was nice to see students, in particular this student, achieving, understanding and receiving recognition for their efforts. Many of the students in this classroom are working above grade level in math, and it was clear during the lessons that I observed, why they had made so much progress this school year. Their teacher was obviously passionate about the subject of math and her excitement and methods of teaching made a clear difference in the classroom and in the success of the students.

I did not teach my lessons in this classroom, but this teacher did help me in preparing my lesson by giving me advice and in lending me books to use as literature connections for some of the lessons I would teach. I taught two six grade classes at Nibley Park Elementary. The teacher gave me specific direction for the topic of my lessons so that they would align with what was being taught in the classroom and would use the ideas and concepts of math investigations. The teacher wanted me to plan and present a couple of lessons introducing and practicing multiplication clusters. Each lesson would be taught twice, once to each class.

I began my lesson by writing the following math problems on the board: 2x5, 20x5, 40x5, and 42x10. As a whole class we solved each of these problems, each of which was fairly easy for the students. I then added another problem to the list, and asked students to use what they had learned in solving the first set of problems to solve the next problem. This problem was 42x5. Most students were able to see right away the connection and solve this problem too. I asked for Abby to share her process for solving this problem. After she had shared the steps that used and I asked if anyone had figured it out using another process, and had two more volunteers share their reasoning in figuring out the answer.

I then added 18x5 to the cluster and asked Alex F. to solve the problem using some of the pieces of information we already had on the board. She used 20x5 and 2x5 to help her figure out the problem. First she multiplied 20x5=100 and then she multiplied 2x5=10 and subtracted 10 from 100.

I passed out a copy of a worksheet on cluster problems to each community (group of 5 or 6 desks) and asked each group to solve the problems in bold print, by solving some or all of the other problems first, and using what they knew from those problems to solve the last problem in each section. As I circulated among the students I observed that most groups were able to solve the problems because there was usually one or more students who clearly understood the procedure from the whole class discussion, and who were then able to help the others in their cooperative group.

After approximately 15 minutes I called the attention of the class back and had the spokespeople from three groups demonstrate how their group solved one of the problems from the worksheet, on the board. After each student explained the process their group had used in solving the problem I asked if any groups had got the same answer using another set of steps. Each problem was demonstrated at least two different ways. Most groups had been able to use what they learned from solving two or more easier problems to solve the more difficult final problem.

what ways?

I passed out the second half of the worksheet, and had the class break into pairs to solve this set of problems. I let students choose their own partners, but I did have to break up two pairs who were not working on the problems and pair them up with others. I gave the class approximately 15 minutes again to solve the problems using the same process as before, but this time I gave them the choice of adding their own problems to the cluster if they thought that information could help them solve the final problem in each set.

When we regrouped as a whole class I repeated the process of having partnerships share their process for solving the problem. I could see that some students were struggling to solve the problem using multiplication clusters. A couple of groups had simply solved the problem using the standard algorithim. It was interesting to me that students who had struggled with math in previous years seemed to get the cluster idea more easily than some of the students who had always done well using standard algorithim, but who seemed really perplexed by the cluster concept. Teshaun, an extremely bright, accomplished student, who had excelled at math in the fifth grade when I worked in her classroom, seemed lost using investigations techniques. She was very frustrated and upset trying to use new methods, because she is the kind of students who wants each step clearly spelled out. It was very difficult for her to grasp that there might be more than one way to solve a single problem. She also struggled because when she tried to use more mental math she would often get the answer wrong, which really upset her.

Some of the class' responses to the problem 233x5 were breaking the problem down into three steps, 30x5, 200x5 and 3x5. The group that shared this process had added 3x5 to the cluster because it was not on the worksheet. Another group solved the problem using four steps 30x5, 20x5, 200x5 and 3x5. This group added both 20x5 and 3x5 to the cluster because they felt that it would help them. Most students solved the problems by following the steps listed on the worksheet.

When I asked the class what kinds of simpler problems helped them the most the majority of students felt that using simpler problems with multiples of ten were the most helpful steps.

One student, Paulina from the second class, knew the relationship between five and ten and how to manipulate those multiples to help her figure out more difficult problems. When I asked her how she figured that out, she told me she had been taught to do that in Russia. She has an American mother and Russian father and they have lived in Russia for most of her life. This has been her first year in American schools, although she speaks fluent English because of her mother. In each lesson I taught she knew shortcuts and relationships between numbers that made her problem solving skills more efficient. I talked to her about it and she explained that that was "just how they taught math in Russia." She was much farther ahead than every other student in the entire sixth grade, especially in solving problems mentally.

It would be interesting to have more examples.

This particular lesson ended with a homework assignment worksheet that practiced the same kind of thinking and problem solving that students could work on individually. Overall I was pleased with the way the lesson went. I felt like most students were at least beginning to grasp the concept, although I knew they needed more practice than was provided for in the workbook. I knew that for the next lesson I would have to create my own worksheet to provide the practice to ensure that all students understood the concept before we moved onto division clusters.

I was very excited to have the opportunity to teach this kind of math and I think it is really important for students to understand these kinds of relationships between numbers. My experience in education has been in literacy, but I see the investigations method of math and standard algorithim as being akin to the relationship between whole language and phonics. The two methods compliment each other and fills in the gaps that each method may have individually. I think that once these sixth graders get over their prejudices towards mental math and investigations that these methods will help increase their understanding of and ability to work in standard algorithims.

One of the hallmarks of investigations math is using the knowledge that students already possess to help them figure out the problems or concepts that they are working on. I think this concept is very powerful and leads to actual understanding of math procedures instead of rote memorization of a set of prescribed steps. The lesson I taught

unnecessary philosophizing

on multiplication clusters was designed to draw on the previous knowledge that the student's possessed about factor pairs for 100 and 1000 and their multiples.

I also learned a lot about myself as a teacher through teaching a series of math lessons, of which this lesson was one, to these students. I taught this lesson to two different sixth grade classes and one of the things I noticed with every math lesson I taught is that the lesson always went better with the second class. More of the students seemed to "get it" and the discussions were more productive and in depth. I realized after a couple of lessons that it wasn't because the second class was better at math, in fact they were a more difficult class all-a-round, but that I did a better job of teaching it the second time. I learned a lot from teaching the lesson the first time, and so when I presented it the second time I was able to explain the concept much more clearly. I especially learned from the discussion portion of the previous lesson what kind of thinking worked well for students and then I could guide the second set of students to that point with less trial and error.

Teaching math to these students and observing Sylvia's class helped change my thinking about Math, which unfortunately I had previously regarded as a necessary evil. Now I realize that teaching Math does not have to be what I experienced as a child, which was long lists of boring problems, preceded by an even more boring lecture. I understand that teaching math can be interactive, integrated, hands on and cooperative.

Melanie - This is an okay report. You need to shorten your observation stuff + your conclusion, and lengthen the "meat" of this report by giving many more examples of math discussion w/ kids. It's way too narrative.

Kelly

PRACTICUM REPORT (Final)
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The class that I observed for the practicum was Sylvia Coon's fifth grade class at Nibley Park Elementary. Sylvia had a very small class this year which really contributed to the success that each student achieved. The class size on the days that I observed averaged 19. Every lesson that I observed incorporated the theories of an integrated curriculum. The teacher read stories based on the math themes to provide a literature connection, provided opportunities for cooperative learning, hands on activities, and time for interacting and sharing as a class. Many of the students in this classroom are working above grade level in math, and it was clear during the lessons that I observed, why they had made so much progress this school year. Their teacher was obviously passionate about the subject of math and her excitement and methods of teaching made a clear difference in the classroom and in the success of the students.

I did not teach my lessons in this classroom, but this teacher did help me in preparing my lesson by giving me advice and in lending me books to use as literature connections for some of the lessons I would teach. I taught two six grade classes at Nibley Park Elementary. The teacher gave me specific direction for the topic of my lessons so that they would align with what was being taught in the classroom and would use the ideas and concepts of math investigations. The teacher wanted me to plan and present a couple of lessons introducing and practicing multiplication clusters. Each lesson would be taught twice, once to each class.

I began my lesson by writing the following math problems on the board: 2x5, 20x5, 40x5, and 42x10. As a whole class we solved each of these problems, each of which was fairly easy for the students. I then added another problem to the list, and asked students to use what they had learned in solving the first set of problems to solve the next problem. This problem was 42x5. Most students were able to see right away the connection and solve this problem too.

I asked for Abby to share her process for solving this problem. She solved the problem by multiplying 20x5 twice, which gave her 200 and then she added 2x5. After Abby had shared the steps that she used, I asked if anyone had figured it out using another process, and I had two more volunteers share their reasoning in figuring out the answer. Kiera multiplied 42x10 to get 420 and divided it in half to get 210. Dani solved problem by using information that she knew, but that was not on the board. She solved the problem by solving 40x5, which she solved used the logic that 4x5=20 and add one zero, and then adding 2x5.

I then added 18x5 to the cluster and asked Alex F. to solve the problem using some of the pieces of information we already had on the board. He used 20x5 and 2x5 to help figure out the problem. First he multiplied 20x5=100 and then he multiplied 2x5=10 and subtracted 10 from 100.

I passed out a copy of a worksheet on cluster problems to each community (group of 5 or 6 desks) and asked each group to solve the problems in bold print, by solving some or all of the other problems first, and using what they knew from those problems to solve the last problem in each section. As I circulated among the students I observed that most groups were able to solve the problems because there were usually one or more students who clearly understood the procedure from the whole class discussion, and who were then able to help the others in their cooperative group.

After approximately 15 minutes I called the attention of the class back and had the spokespeople from three groups demonstrate how their group solved one of the problems from the worksheet, on the board. Group One solved the problem 23x4. The steps in the cluster given on the worksheet were 20x4, 25x4 and 2x4. This group used 20x4 and 2x4, and added a four, which equaled 92. Group Two's problem was 13x25. The steps given in the worksheet were 4x25, 10x25 and 12x25. This group multiplied 4x25 three times and added their answers together, which gave them 300. Then they added 25. Their answer was 325. The problem for Group Three was 17x50 and the given steps were 3x50, 20x50 and 7x50. This group solved the problem by multiplying 20x50to get 1000, then they subtracted 3x50=150. This gave them 850.

After each student explained the process their group had used in solving the problem I asked if any groups had got the same answer using another set of steps. Each problem was demonstrated at least one other way. Most groups had been able to use what they learned from solving two or more easier problems to solve the more difficult final problem.

I passed out the second half of the worksheet, and had the class break into pairs to solve this set of problems. I let students choose their own partners, but I did have to break up two pairs who were not working on the problems and pair them up with others. I gave the class approximately 15 minutes again to solve the problems using the same process as before, but this time I gave them the choice of adding their own problems to the cluster if they thought that information could help them solve the final problem in each set.

When we regrouped as a whole class, I repeated the process of having partnerships share their process for solving the problem. I could see that some students were struggling to solve the problem using multiplication clusters. A couple of groups had simply solved the problem using the standard algorithim. It was interesting to me that students who had struggled with math in previous years seemed to get the cluster idea more easily than some of the students who had always done well using standard algorithim, but who seemed really perplexed by the cluster concept. It was hard for them to give up a method that they understood and that worked to try something new.

One of the responses to the problem 233x5 was breaking the problem down into three steps, 30x5, 200x5 and 3x5. The team that shared this process had added 3x5 to the cluster because it was not on the worksheet. Another group solved the problem using four steps 30x5, 20x5, 200x5 and 3x5. This group added both 20x5 and 3x5 to the cluster because they felt that it would help them, although they did not end up using the information they got from 20x5. In setting up the problem they had thought it would help them, but then decided it was unnecessary. Most teams solved the problems by following the steps listed on the worksheet, which were 30x5, 200x5 and 233x10, and then adding 3x5 to the cluster to get their final answer. A few of the teams solved the problem using the steps given in the cluster and then adding five three times to the answer. Three teams solved the problem by multiplying 233x10 and dividing that in half to get 1165.

The second problem on worksheet 2 was 46x25. The steps listed in the cluster were 4x25, 40x25, 6x25, 10x25 and 50x25. Most groups solved this problem by multiplying 10x25 four times to get 1000, and then adding 6x25. When I asked students how they reached 6x25 most had used the standard algorithim. The teacher did not encourage using standard algorithim for any problem, so I had one of the two groups that had reached the answer to 6x25 another way share their reasoning. They figured it out by using what they already knew which was that 4x25 is 100 and 2x25 is 50 which gives an answer of 150. 1000+150=1150.

The final problem was 2507x4. The steps listed in the cluster were 500x4, 2500x4, and 1000x4. To answer this problem the first team to share used the strategy 1000x4, twice added to 500x4. This group added their own step of 7x4 to help finish the problem. Most other teams used the same strategy. One group multiplied 500x4, five different times and then added their own step of 7x4. When I asked the class what kinds of simpler problems helped them most, the majority of students felt that using simpler problems with multiples of ten were the most helpful steps.

One student, Paulina from the second class, knew the relationship between five and ten and how to manipulate these multiples to help her figure out more difficult problems. One other strategy that she used very effectively was the commutative properties of multiplication. She had solved the problem of 13x25 in her group this way: 10x25 +3x25 = 250+75 =325. She could very effectively break a problem down into much simpler steps by using the properties of multiplication and addition. Another way she did this was to use to property of associativity to re-group problems. She solved some problems by using a higher, but simpler multiple like 10 and then subtracting the appropriate amount from the answer.

When I asked her how she figured these things out, she told me she had been taught to do it in Russia. She has an American mother and Russian father and they have lived in Russia for most of her life. This was her first year in American schools, although she speaks fluent English because of her mother. In each lesson I taught, she knew shortcuts and relationships between numbers that made her problem solving skills more efficient. I talked to her about it and she explained that that was "just how they taught math in Russia." She was much farther ahead than every other student in the entire sixth grade, especially in solving problems mentally.

This particular lesson ended with a homework assignment worksheet that practiced the same kind of thinking and problem solving that students could work on individually. Overall I was pleased with the way the lesson went. I felt like most students were at least beginning to grasp the concept, although I knew they needed more practice than was provided for in the workbook. I knew that for the next lesson I would have to create my own worksheet to provide the practice to ensure that all students understood the concept before we moved onto division clusters

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