Effective Math Instruction:
Keeping Kids Engaged, Interested, Excited, and Learning!

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Before the school year started, I had a number of ideas of how I wanted my first grade classroom to look and run for the year. This was my first school year with my own classroom, so I was both nervous and excited to work with a group of energetic first graders. After subbing for 2 ½ years in various classrooms and grade levels, and as a long term substitute teacher in a 4th grade classroom, I had collected a variety of ideas for both classroom management and educational activities and projects. I had a wide variety of focuses for the school year, but after about a month, I decided I was never going to survive my first year of teaching first grade and accomplish all that I wanted to unless I chose one main area to focus on. (Not to mention the HUGE step back I had to take – I was used to teaching 3rd and 4th graders who are much more self-sufficient and have longer attention spans!) Our district, that serves approximately 1,200 students throughout 3 different schools (Birnamwood has about 355 students in a rural setting), was placing a large emphasis on literacy, especially Daily 5 and all its components. I started using the Daily 5 framework while student teaching, I was very comfortable with most of the components, including guided reading, conferencing, etc. I decided to focus my attention partly on classroom management and along with that, keeping my students engaged and focused during each day's lessons.

I began my action research for RECESS by taking a look at the students in my classroom who I noticed needed redirection several times during a math focus lesson. The small group of students I chose to focus on had attention issues no matter what we were working on. I found this group of students had an incredible need for redirection and re-teaching on any given subject or day, and I was constantly trying new ways to keep them focused. I decided that because I didn't have any technology in my classroom aside from an overhead projector and my own computer, that something I wanted for my classroom was technology with the ability to keep the students actively engaged and interested in their own math learning. This thought led me to the decision that I really wanted and needed a Smart Board. Since I began teaching after graduation, I always had access to a Smart Board and knew how to effectively keep my students engaged in

math with the use of the interactive white board's vast variety of educational math activities. I set out to get myself a Smart Board. At first I was told there was a portable Smart Board for use in our school. After looking into that, I found out that there was not one. I was asked if I wanted to try out a document camera, but it was on a wheeled cart and was only in the way in the classroom, so I turned it down. My next idea was to spend the time typing up a proposal to turn into my building administrator and the superintendent. After spending hours drafting and revising my proposal, I turned it in with high hopes. When my principal thanked me for the proposal, he told me "if I had the money, everyone would have a Smart Board." That's pretty much when I decided that I was not going to reach my goal of getting a Smart Board for my classroom this school year in order to more actively engage my students. At this point my question was no longer "how can I use technology to make math more interesting and engaging for my students?"

My next step in the action research process was to not only really focus on the small group of students needing constant redirection, but to focus on finding better ways to teach math and therefore keep them interested and engaged. Our school's math curriculum was not too exciting to me, so I figured it probably was not exciting the kids very much either. Starting from the beginning of the year, our math block consisted of mainly whole group lessons. We would start the lesson by reviewing what we already know, and then I would spend time talking, teaching, and demonstrating using the overhead projector or the dry erase board in the front of the classroom.

Each math block was about 50-60 minutes long, depending on the day of the week, and for the first 30 minutes the students were required to sit at their desks and listen to me go on and on. Normally we would get out 10 frames, counters, white boards, etc., but for my small group of students with major attention issues, these items were only *more* of a distraction versus a tool for them. For the next 20 or so minutes after the whole group lesson, we would all pull out our work books and go through both sides of the day's worksheet as a whole class, with me working on the overhead projector. I had students who would complete both sides in less than ten minutes, and I had students who would take 20 minutes to finish just a few problems on one side. I would circulate the classroom providing re-teaching and guidance where needed, but I was finding that I was spending the majority of that 20 minute block only able to help two or three students who were stuck. The small group of students I referenced earlier would need a lot of re-

teaching in order to get their worksheet done because of their lack of attention during the whole group lesson prior, so I would end up using my lunch hour to work with these students while they missed out on recess. Unfortunately, these were the kids who needed to get outside and run around!

What about the other students who were stuck and I never got around to? Well they were either missing recess to work with me, or assigned to finish their work at home and return it the next day (which about half of them never returned their work). Needless to say, I was not at all happy with the way our math block was going and I knew I had to make some pretty significant changes. Because of the format of that current math block, I was unable to do much along the lines of differentiation. When I think differentiation, I immediately think about our Daily 5 literacy block that really allows me ample time to meet with small groups of students as well as running individual conferences with students. Our district is extremely focused on Daily 5 and differentiating in literacy via guided reading groups, individual conferencing, etc., but there was nothing to be said about differentiating during math. It's a known fact that all students learn differently and at different time and the literacy portion of that was being addressed, but not the math portion. That's where my next idea came into play. I knew that if I continued my math block in this manner (whole class lesson and whole class workbook) for the duration of the school year, that about half my students would be bored because they catch on quickly to new ideas, about ¼ of my students would be learning the material at the rate the workbook was expecting them to, and the other ¼ would be lost – and even if they didn't understand the material, they would be forced to move on to the next lesson the following day. Not to mention, attention and behavioral issues will most definitely increase when there is a lack of understanding.

I started researching math frameworks via the internet. I had also heard about the Sisters and their start of math Daily 5. I found a lot of great resources on the internet and started thinking about our Daily 5 literacy block and how it consists of a mini-lesson, student discovery and practice via "rounds", and then a wrap-up discussion. I really look forward to my guided reading groups and I know how extremely beneficial they are for all students, no matter what reading level they are at. I decided I wanted to try a new format of math after the kids returned from winter break. I wanted to move towards a more discovery-based math block in hopes that it

would help me to more easily differentiate, as well as allow more time for me to work with small groups of students – in essence, guided math groups.

When the students returned, I told them they were no longer going to be using their workbooks during math. Their response: they were ecstatic! Come to find out, they did hate their workbooks as much as I did! I explained that from now on we would have a short lesson of about 15 minutes, followed by a period of exploration (about 30 minutes) and practice in one of three ways: by yourself, with a partner, or in a small group. We would end each math block with a 10-15 minute discussion about our discoveries from the math work time. The students were really excited and so was I! At the end of our first new math block, I asked the kids to rate their experience in math that day on a scale of 1-4: 1-you hated it, 2-it was okay, 3-you liked it, 4-you loved it. I got an overwhelming rating of 4s, which was exactly what I was hoping for! I decided to continue with this format for the remainder of the year. The kids loved it, and it allowed me a lot more time to work with small groups who needed re-teaching or small group work time. I felt like math was more exciting for the students because they became the "explorers and discoverers"! I was able to more effectively differentiate my math lessons through the use of small guided math groups and various activities that met each child's needs. I also decided that I would like to partner students instead of letting them choose their partner (not all of the time; it depended on the activity and the objective). Doing so allowed me to partner a student who really grasps the concept with a student who might be struggling, allowing them to teach each other as well. In essence, the struggling student hopefully begins to understand a concept while the student who has grasped the concept well can work on articulation as they help their peers understand the concept.

Although I did not have a whole lot of time for guided math groups, I was able to fit groups in a couple times a week. I formed my groups by quick quizzes or check-ins, in which I gave the students a few questions pertaining to the concept we had been working on. Those students who had mastered the concept would be given a fun game or activity to play (usually with a partner) that would enhance their understanding within the skill or concept we were currently working on. The struggling students would be put into small groups based upon their needs. I also did try my best to meet with an enrichment group, but due to time, it was difficult to always fit the enrichment group in. My main focus was to get the struggling students into small groups that would meet with me two to three times a week. Then, beyond core instruction,

the majority of the struggling students were getting small group interventions within their math block as well as during our I/E (intervention/enrichment) block.

To determine whether my new math block and guided math groups were effective, I looked at test scores from a small group of struggling students from the beginning of the year and then again after we had been working in guided math groups. Now obviously our assessment material was different. At the beginning of the year we focused mainly on addition and subtraction, and for the 2nd and 3rd trimesters there were a variety of concepts such as place value, money, time, and measurement. I would definitely say that test scores increased after I was able to work with small groups of students on a more regular basis. The extra guided time with a few peers in a small group helped them better focus their attention, and I was able to present the skills in a variety of ways and let the kids talk about their strategies and thoughts, without keeping them in from recess and me missing my lunch break.

Overall, I do believe that the new format for our math block was not only more exciting, but it allowed the kids more time to discover and then discuss their discoveries with each other. They became teachers to each other, while I was there to prompt them to tell more information. We would often write down our discoveries for the day, and I would always write down what the kids said along with their name next to their statement. It made them feel really great seeing their name up there, and it encouraged some of the quieter students to participate and share their discoveries as well. Allowing the kids to discover and work in "rounds" with different activities kept students engaged in their work, because the task was only about 10-15 minutes, and then they knew they would be switching to a new task within the same math concept. They were always held accountable for turning some sort of work in, or coming to our discussion with some math thoughts and discoveries.

My next thought, and probably yours too: so now what? What did I learn? How can I continue to improve my math block next school year to maximize student learning and engagement? One thing my co-teacher and I did was suggest to our principal that our math block be after lunch instead of in the morning right after our Daily 5 literacy block. As far as I know, our wish was granted and our math block will be from 11:50-1:00. The reason we wanted this change was because we would like to again move more toward the Daily 5 math format with time for student discovery "rounds", and I thought that having Daily 5 literacy and Daily 5 math blocks back to back would be way too much for a first grader (and me!!). I am going to make

sure I have time to meet with small groups of kids and run guided math groups on a weekly basis. I am hoping to compare math scores from last year with this coming year, and I'm confident I will see an increase in scores after allowing more math discovery and discussion times and guided math groups. I will definitely continue researching best practices for math and attend workshops dealing with math in the upcoming years. I also plan to find a variety of research-based interventions to use within my guided math groups, and to document what kids are in my groups and find a way to monitor their progress.

Sources

http://www.thedailycafe.com/public/main.cfm