Case Study: 2nd Grade

by Lisa Meyer, with Nicole Bridges and Amber Dalton

Setting

With this case study, we join two second grade classroom teachers at the same school in Albuquerque Public Schools (APS) with 100% FRPL as the previous case study. As school attendance dropped in the nineties due to an aging neighborhood surrounding the school, the school was made a fine arts magnet hoping to attract more transfer students.

Amber Dalton is in her first full year of teaching and went through the AIM4S^{3}™ training in the middle of last year. She has nineteen students. Eight of them are boys and 11 of them are girls. Three of the students are identified as gifted, no students receive special education services, and two are classified as English Language Learners based on their WIDA ACCESS scores (2.5 and 3.5). Fifteen students are bused from a low-income apartment complex several miles away.

Amber Dalton and Nicole Bridges built a year-long plan last summer. This has been a huge support in unit planning during the school year.

Nicole Bridges is in her third year of teaching and second year of full implementation of AIM4S^{3}™. She has 18 students, with three identified ELs ranging from a 2.9 to a 3.4. She has 11 boys and seven girls; one student is identified as gifted and two receive special education services. Ten students are bused, five students come from the local neighborhood, and three are transfer students.

Planning for the Year and the Unit

The district has organized the Common Core State Standards into 15 Units of Study at second grade and is currently developing performance assessment tasks for each unit. The two teachers worked together to backwards plan this school year during the previous summer, looking at the Units of Study for each trimester. They mapped out the standards by domains and grouped the Units of Study into seven AIM4S^{3}™ umbrella units for the year. Some of the district units of study are 5-10 days long. Their AIM4S^{3}™ units were 3-5 weeks long and built around similar concepts. This allowed them to go deeper into the material and to build Compendiums that could be used for a number of Units of Study. They looked closely at the units of study for each trimester, making sure that their instruction matched the standards that would be tested on the district short cycle assessment. This year-long planning has been a huge help to them as the stress and reality of the year has kicked in. It has been key to pacing their instruction so they can address all of the CCSSM for their grade level.

This case study focuses on the fourth unit of the year for Amber and Nicole, adding and subtracting within 1,000. This unit builds on the previous three. They started the year working on place value and adding within 100 using mental math strategies and manipulatives. They then moved to subtraction, emphasizing the connection between the two operations. The concepts of time and money were integrated into these units. The first three units of the year emphasized conceptual understanding of addition and subtraction and fluency with facts and strategies. This fourth unit emphasizes application and includes reinforcing strategies they have already been working on as well as strengthening their understanding of place value so the students can truly use the standard algorithm when they are developmentally ready.

This unit targets the first two critical areas in the CCSSM for second grade: (1) extending understanding of base ten notation and (2) building fluency with addition and subtraction. It incorporates the APS Units of Study 5, 6 and 7 and addresses

Number and Operations in Base Ten, CCSSM 1, 3, 4, 7, 8, and 9. The unit built on students' previous work with place value and addition and subtraction, extending these concepts to 1000 which specifically addressed these standards:

- *2.NBT.B.7. Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds; and*

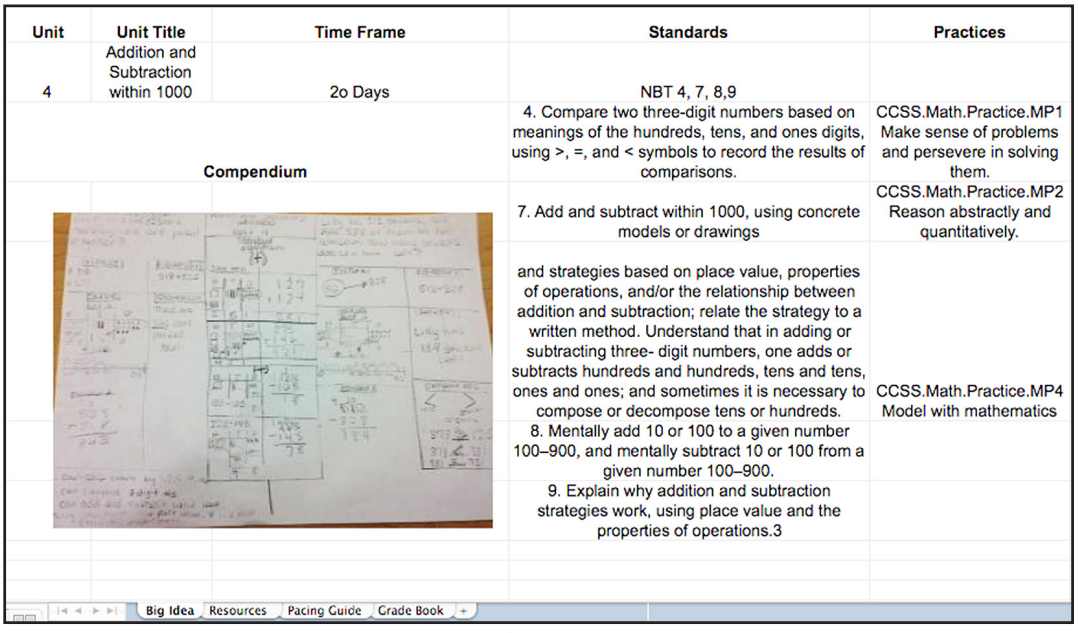
- *2.NBT.B.8 Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.*

While each of the mathematical practices were addressed at some point in the daily lessons, the unit specifically targeted reasoning abstractly and quantitatively and modeling with mathematics.

Amber and Nicole began by handwriting their year-long plan and unit notes. After planning their third AIM4S^{3}™ unit, they decided to try using an Excel® document to organize their work. It was organized in one workbook with four different spreadsheets or tabs. The first focused on the "big ideas" and included the standards, mathematical practices, time frame, and a picture of their planned Compendium. The second tab included resources that would support the unit and included links and notes to songs, chants, games, videos, literature, and activities. The third tab included a pacing guide for the unit so they could see each day and the activity/lesson/focus that they would be addressing. The fourth tab was a grade book. This was the first time they were breaking down the unit by specific standards and documenting students' progress on each of these standards.

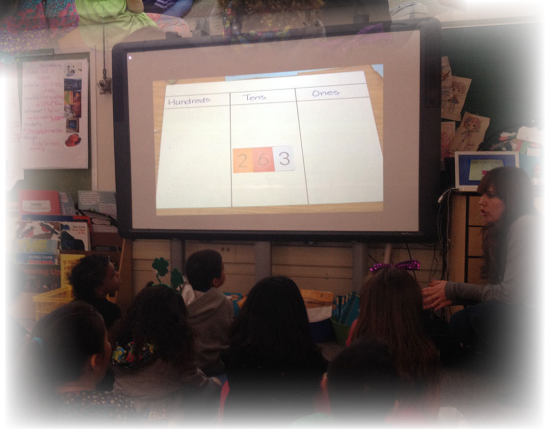
Both teachers want to move more of their unit planning to Excel® spreadsheets. They think the spreadsheets are an improvement over the handwritten notes from the earlier units; these planners will be easier to update and revise to support their planning next year. Putting together this planner was a big step for them and is a work in progress. They found they only partially completed the pacing guide for the last unit, so being more thorough with this is one of their goals for the next unit. They are excited about looking at student data by individual standards. Nicole input her data into the spreadsheet and tracked student progress throughout the unit. Amber is still working on developing a system to get this information recorded in a timely manner and was using paper and pencil for record keeping.

As they planned the unit lessons, Amber and Nicole selected materials from *Investigations (Scott Foresman)*, the previous adoption, *Stepping Stones (Origo Education)*, resources from the Internet, and teacher-made materials to build their units. There is no current adoption of materials for the CCSSM in the district. While they have enjoyed the flexibility of pulling from many resources, not having a specific set of Common Core materials to use as their primary resource has been a challenge.



Nicole and Amber used an Excel® unit planner to organize their work. The four tabs at the bottom show how they divided the different information.

Since the beginning of the year, they have been using pre- and post- assessments that Nicole has developed to check students' understanding of the standards. For this unit, the pre-assessment allowed them to see the strategies students used when they tackled problems with larger numbers. They found many students drew pictures with base ten blocks and used a treeing strategy to add or subtract the hundreds, tens and ones. This gave them valuable information on how to support students during the unit on extending the strategies they had already been using to larger numbers. After the third unit, they also began using exit slips to check on students' understanding of specific standards throughout the unit. They found that these short, independent check-ins helped them to better adjust instruction during the unit.



Case Study: AIM4S³™ Components

Focus and Motivation

Both Amber and Nicole use Focus and Motivation on a regular basis with students. They kick off the unit with it but also regularly incorporate this component into their instruction. They use literature, videos, songs, chants, hands-on activities, and games.

Videos from *Youtube* kickstarted the unit in both classrooms. One was called *Maths—Subtracting two digit numbers with borrowing*. The screen would show a man drawing with base ten blocks exactly what he was explaining. The first day they watched the video on addition and the second day the video on subtraction. The videos were chosen because of their content, but the students found it very entertaining because of the gentleman's unique accent. They wanted to see it a number of times. After the video, they moved into a hands-on activity using base ten blocks.

During this unit, they used a number of songs and videos from the Internet. They find students are quiet and focused when they use media. In just a few short minutes they can prep students for the activity and lesson they will be doing that day. The district has a subscription to *Discovery Ed* so they have been incorporating more of those materials along with *Study Jams, Fuel the Brain, and YouTube.*

Songs are a great hook for their students and can add movement to the class. Students especially enjoyed *Add em' Up* during this unit. They first played it and just watched and listened to it. Then they sang it together using the words at the bottom of the screen as a support. The next day they played it again, making more connections to what they were studying. At first students were timid about singing, and the teachers would find themselves singing alone. With repetition, more students jumped in and toward the end of the unit they were quite animated. While not every student loved the songs, for many this was a powerful connection and reinforcement of the material. Songs can be used to reinforce review material as well as to support the new content in the unit. Amber and Nicole find it is essential to bring in a wide range of activities and ways to present material to tap different learning styles.

These teachers often started their class with an activity called *Skip Counting in a Circle*. This was an activity they had been using for a number of units. Second graders need to be able to skip count by 5s, 10s, and 100s within 1000 (2.NBT 2). This is a challenge for some second graders, especially skip counting starting with a larger number and going down, and crossing the decades and the centuries. For example, if students are counting 62, 64, 66, 68, 70, 72, they are most likely to have trouble moving from 68 to 70. Second graders need lots of practice with this, and Amber and Nicole have found short chunks of time on a regular basis are more effective than a long session.

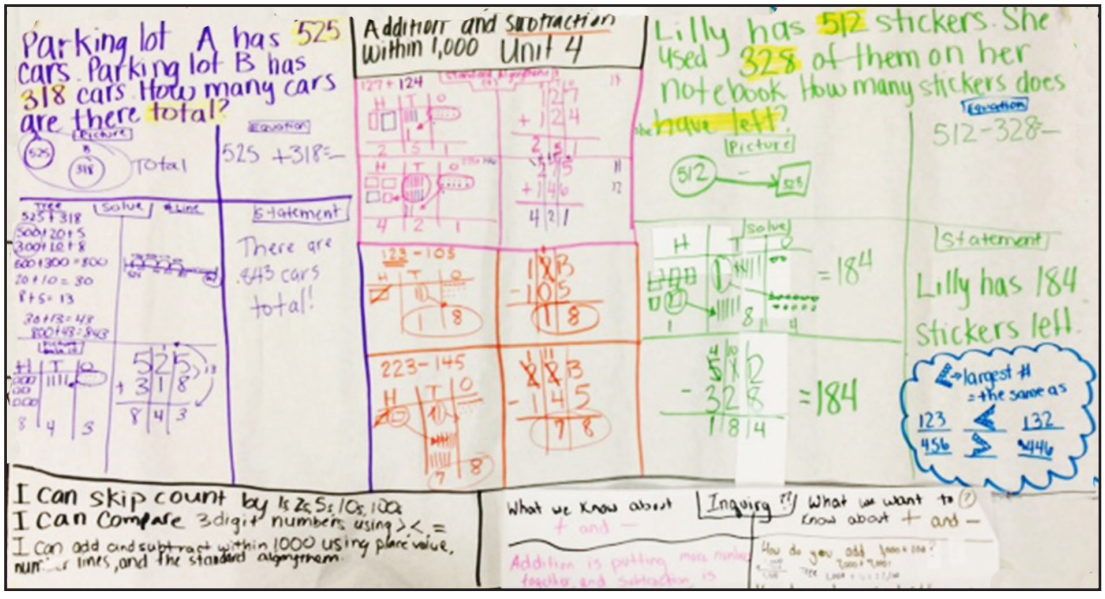
The students look forward to this activity; they come in from recess and sit in a circle. The teacher gives a number they are going to start with and describes how they are going to skip count. "Today we'll start with 185 and count up by 5s." One student starts, and they go around the circle with each student saying the next number. The teacher helps students as needed to be successful. While they do some choral calling with skip counting for practice, they find this strategy over time has students more focused on how skip counting works and gives the teacher an opportunity to support struggling students. In the first part of the year, they found they needed to use base ten blocks to support students counting. For example, each child would have a ten block. Together they would build a number in the middle of the circle, and each student would add their block to the middle of the circle as their turn came up. With this unit they were working on skip counting in the hundreds, both up and back.

Compendium

Planning the Compendium was a key piece of the unit planning before any instruction began. Based on the standards, the teachers wanted to make sure they included multiple strategies to solve addition and subtraction problems to 1,000. They were using base ten blocks and drawing pictures of them as one of their strategies to solve problems. The students had moved into regrouping naturally through all of the hands-on activities they had done in the previous unit. Many had been moving toward the standard algorithm on their own. The teachers decided to include this on the Compendium while reinforcing for students the other strategies they had already taught. Amber and Nicole also wanted students to see addition and subtraction problems embedded in story problems. They were finding that story problems were a challenge for many students. They had used a four square strategy during the previous unit to help students draw an illustration, write an equation, show how they solved the problem, and write an explanation. The teachers decided to include a four square example of a word problem in both addition and subtraction on the Compendium to help cement this strategy for students and give them clear visual models to refer back to during team and independent work. On these models, they used number lines, "treeing" the problem, drawings of base ten blocks, and the standard algorithm to support students in using multiple strategies with their work.

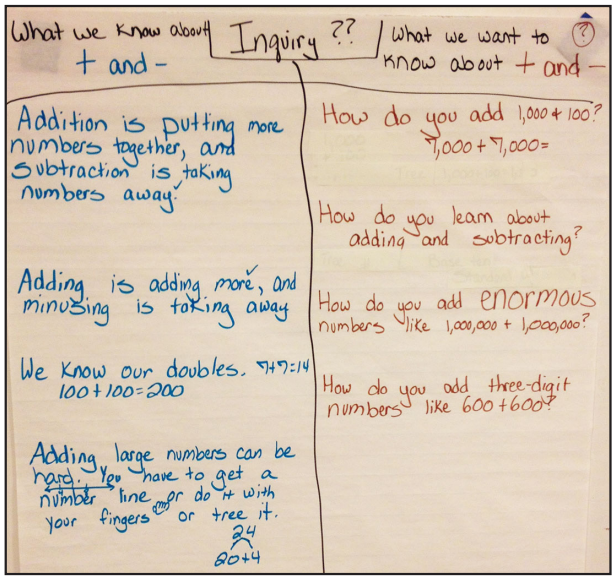
On the second day of the unit, they each introduced the Compendium. Nicole built the Compendium in four days with students right at the front of the unit. Amber tends to construct the Compendium in smaller pieces and may take five to six days to complete it. She finds it easier to keep students' focus during the smaller chunks. Both have the Compendium done in the early part of the unit so they can refer to it during lessons and students can use it as a resource.

They began the Compendium with the title and the standards. They thought this would help students understand that they were expanding on standards that they had worked on before. They emphasized that this unit was exciting because they would be working with larger numbers. They then moved on to the inquiry chart. Both of them have found it challenging to get students to give more language and explanation in the inquiry section. Students tended to give equations, and once one equation went up on the inquiry chart, lots of hands would go up with equations.



Compendium—Second Grade, Addition and Subtraction Within 1,000

After Nicole first did the inquiry chart, she was sharing with Lisa Meyer that it didn't feel right. She wanted the students' responses to include more language. They decided to go back and do the inquiry chart again. Lisa would facilitate at the front of the class and Nicole would join a group on the floor to observe closely the students' discussions and to nudge them to explain what they were thinking. As they turned to talk to their neighbor about what they knew about addition and subtraction, Lisa pushed them to explain to each other what they both meant. When they shared their discussions out to the class, one partner group said, "Addition is putting more numbers together, and subtraction is taking numbers away." Another added, "Adding is adding more, and minusing is taking away." Lisa then pointed to a chart that had some of the strategies they had already learned. "What else do you know about addition or subtraction? What about strategies we've studied?" Then another group added, "We know our doubles." Lisa then prompted them for an example they could add to the chart. She asked a student who gave an equation with large numbers, "That is a problem with large numbers in it. What do you know about adding large numbers?" This was done to get students to think more deeply than just the example equation. The partners then added, "Adding large numbers can be hard. You have to get a number line or do it with your fingers or tree it." Lisa added this comment, including sketches to help some of the students be able to read it later.



The inquiry chart in this unit was done a second time to push students to use more language and explain their thinking.

After they finished the "What we know about addition and subtraction", the class moved on to what they wanted to know. This time, Lisa and Nicole coached students to ask more in-depth questions and not just give equations that they weren't sure how to solve yet.

Nicole and Amber have continued to work on building the inquiry chart with students. They have seen that prompting students for more language with their responses makes a difference with student statements and questions about what they know. They are currently working on processing the inquiry chart frequently during the unit so the class expands and revises some of the students' statements about what they already know and the class answers some of their questions based on the lessons or videos.

Next they moved on to the concept frame, building first the addition side and then the subtraction side. They started with the example problems in the middle of the chart on addition, which included strategies from previous units and then included new learning alongside it. They then moved to the word problem and the four square strategy. They repeated this process with the subtraction side, spreading these out over multiple days.

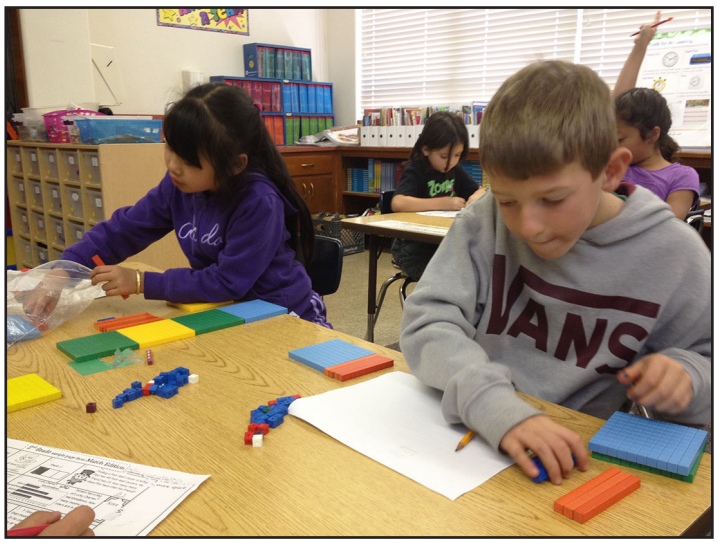
Unit Lesson

The unit lessons were typically 60-90 minutes long. They began with a short Focus and Motivation activity and included revisiting some part of the Compendium, whole group instruction, individual or partner practice, and games to reinforce concepts and practice basic skills. Both Nicole and Amber have moved to using guided math groups or small group support as an integral part of their practice time. They also use exit slips at planned points in the unit to check in and see how students are doing with specific standards. These exit slips inform their instruction and their small group lessons and support.

After Nicole has done the whole group presentation or practice of material for the day's lesson, she uses a Continuous Feedback strategy to have students self-assess whether they would like more support and work with the teacher or are able to work independently or with a partner. With this process, students also see who is feeling confident with the content and could be a good resource to go to. Nicole has worked diligently with students to develop a classroom culture where students feel comfortable with this process and can effectively identify the type of support they need to be successful with the day's

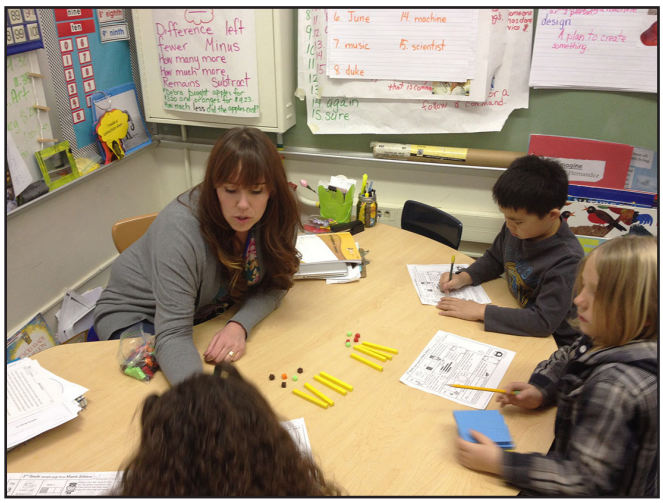
activity. She also monitors students' progress to make sure students are in the right space for the support they need, so she will direct a student to a certain seat if she needs to.

During the work session, Nicole typically has four or five identified students working with her and two open chairs that students pop in and out of if they discover they need more help and want to ask her questions. She has found this 15 to 20 minutes of flexible practice and support works well for her students and gives her an opportunity to provide targeted support to students who need it. She also at times brings up her high achieving students to provide extensions or challenges.



Students use base ten blocks to support their conceptual understanding of addition using place value strategies.

During this time, the other students are working at various places around the room with partners, side-by-side with other students, or individually. Using a quick class check-in at the end of the work session has helped to troubleshoot challenges that come up with how students are using their time or where they are sitting. One student often solves his problem of not getting work done by sitting on the floor right behind Ms. Bridge's chair where he has less distractions. While he still has challenge days, he is getting better at self-monitoring and taking more responsibility for his own work. This open seating or students choosing a "smart fit" for their learning has worked well with this group, but the teacher would adjust this procedure based on the needs of her students, so it could look different next year.

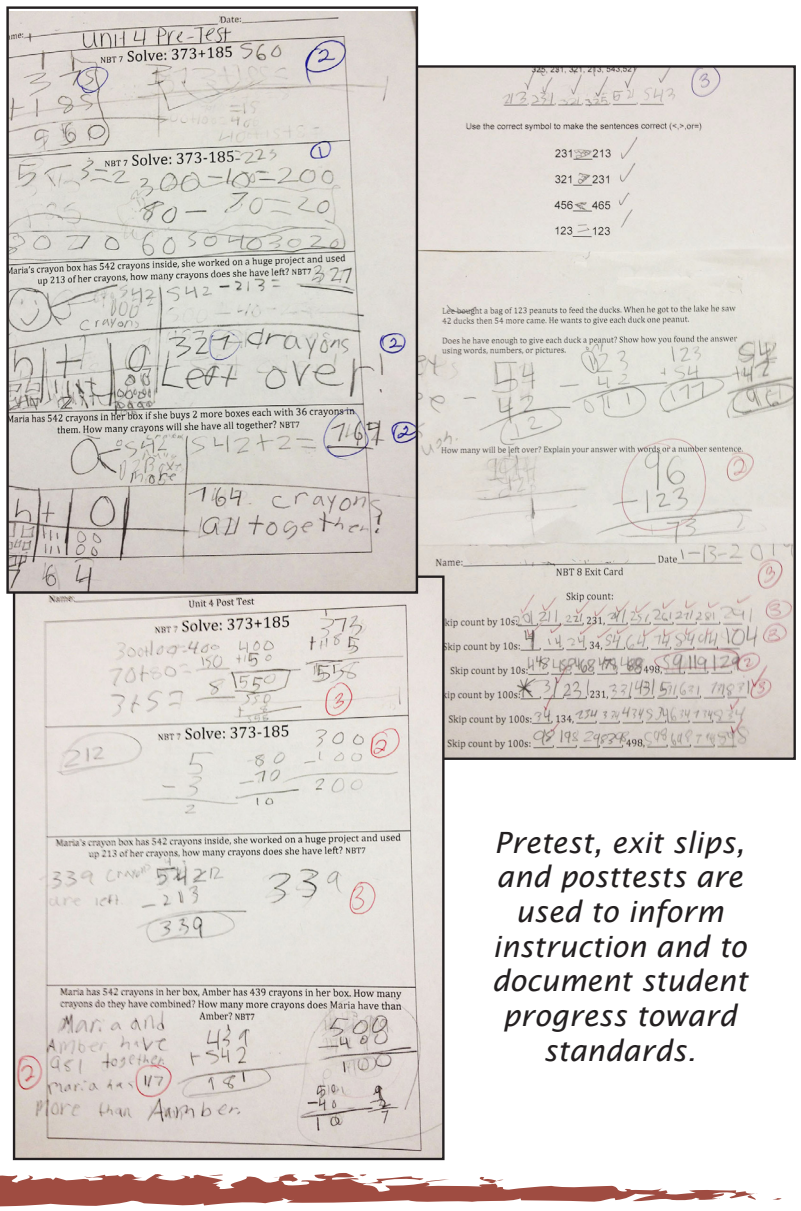


Small guided groups allow Amber to provide targeted and differentiated instruction.

Amber moved to guided math groups after the year was well underway. It took time to feel comfortable with managing the students working during the independent practice time at their desks. Early in the year she would float and help students or table groups as needed but found she didn't have an opportunity to work intensely enough with students who needed more support.

She now works with a group of students at her kidney table while the other students are at their assigned table seats. She encourages students at their tables to ask each other questions and to work through problems together without just giving other students the answer. She typically calls up the specific students that she wants to target for that day and at times has students ask to work with her as well.

As this was her first full year of teaching, Amber was nervous initially about setting up routines so students would work independently while she was working with a small group. It took her a few months to feel confident enough to jump in and give it a try. She found that she needed to teach students not to interrupt her during this small group instruction. At times this meant ignoring students who were trying to interrupt so they would see she was serious about this. She also found getting up and quickly circulating around the classroom a couple of times during the work session supported students in working independently at their desks. She also has given students more independence at being able to move around the room and take care of their needs



Pretest, exit slips, and posttests are used to inform instruction and to document student progress toward standards.

(sharpening pencils, getting papers and manipulatives, and using a hand signal to ask to go the bathroom). While it has taken time to put these pieces in place, Amber finds it has given her valuable opportunities to work with small groups for short, uninterrupted blocks of time.

One of the challenges both teachers face is what to do with the students who finish their work quickly or are ready to move on. Both use technology to provide challenges for these students, giving them opportunities to extend their learning and to work independently on more complex material. There is also an expectation for students to show multiple ways of solving a problem before they move on to these extension activities, and at times these students want to help other students who have questions.

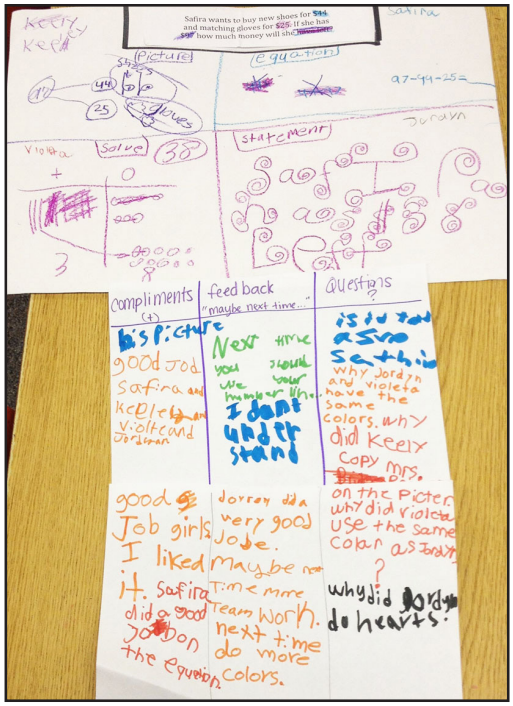
Throughout the unit, both Amber and Nicole regularly used the four square strategy to have students work on word problems. They found this scaffold helped students in doing more complete work and looking more closely at the problem. Nicole would have students work in teams of four on large construction paper and used the *Project* GLAD® (Guided Language Acquisition Design) strategy of having each team member use a different colored pencil so you could clearly see that everyone had contributed to the work. The group would then share their problems out to the class, and the students would give feedback on how they had organized the work and ask questions of the group.

While Nicole thought this was a valuable experience for the students, it felt like they were on the floor too long and weren't very focused after a couple of groups presented. She then decided to post the student work and have the teams give feedback to each other in writing. She taped another large piece of construction paper under the work and divided it into three columns, one for compliments, another feedback and the third for questions. The class worked through one of the team's work together so students understood the difference between the three headings and could also talk about using nice language and not hurting people's feelings (see picture on page 81).

After the full class modeling, students went with their teams and looked at another groups' work. They then wrote their feedback and questions underneath. Rather than have them visit each team's work in one sitting, she would give them 4 or 5 minutes to look at one team's work and then they would continue with other activities. Later she would send them to another team's work. Chunking it in this way kept the students' interest high and the discussions focused. She found this strategy supported Continuous Feedback in the classroom with students looking much more closely at their own work and the work of other teams. She loved that students were learning to give each other constructive, supportive feedback.

Closure and Goal Setting

Closure and Goal Setting is a component area that Amber and Nicole are still working on. This year they have made strong gains in writing post-assessments that specifically match the standards. This has helped them to understand and own the standards at a deeper level, which makes a difference during their planning and unit instruction.



Second grade students give feedback to other teams on their word problems.

Midway through the fall, they both decided to grade assessments and get them back to students the next day. They have found that students are more interested in the results and see the assessment as a reflection of what they know and still need to learn. When it took them a week or two to share them with the students, students didn't seem interested in the results. They also now go through the actual assessment with students instead of just sharing the result of beginning steps, nearing proficient, proficient or advanced.

Both teachers have used individual data binders with the students but have not felt like they have been as meaningful as they had hoped. They are now looking at how to post classroom data to share with students and use for goal setting. As a grade level, the teachers are looking at building a visual data wall for their own monitoring of student growth as so they can see the number of students at the different levels on the short cycle assessment and see the progress over time.

As far as other closure activities, they see this as a next step for them. They would like to go back to the literature previously used in the unit, processing the inquiry chart as well as do more goal setting around classroom data.

Key Instructional Principle Connection: Teacher Mechanics and Delivery

A variety of Focus and Motivation activities bring energy and excitement to the classroom. They present material using different modalities and often are some of students' favorite activities. They ask to watch videos and sing songs over and over. This repetition makes the information memorable, moving it from short-term to long-term memory. When choosing videos, consider how well they are designed to support and scaffold the concepts. Are there illustrations or examples that clearly depict the concepts? Is the language clear and easy to understand? Can language learners participate and follow along as well?

Final Reflection

This year Amber and Nicole feel they have had a more coherent curriculum for their students, pulling from a wide variety of resources and grounding their instruction in the CCSSM. The year-long planning they did in the summer was well worth the time. As Amber shared:

> It was huge for us to plan this summer for the whole year and be able to go step-by-step and to map it out. So throughout the year we haven't even had to struggle with what are we focusing on this unit. It is all planned out which is amazing when you have a million other things coming at you that you have to deal with as a teacher.

Nicole seconded that planning together has been a huge support. Last year she did most of her planning on her own. With them planning together, they have been able to share ideas and put more systems in place, which has made it more manageable but also supported them in producing better units that tie all of the pieces together. Their Compendia are stronger and the assessments are directly tied to what they are teaching. Having a clear road map of where they are going and the instructional tools with theAIM4S$^{3\text{™}}$ framework has supported them in better meeting the needs of their students and being more effective with their instruction.