SIOP Lesson Plan

Date: June 27, 2012

Classroom population: Second grade classroom with 22 students, 5 Spanish ELL's three of which have been learning English since kindergarten and two beginning students.

Overall lesson topic:

Mentally adding and subtracting 10 and 100

- The purpose of this lesson is for students to learn how to simplify addition and subtraction using base 10 concepts. For example adding 70 or 100 may seem like a difficult concept for second graders to grasp, but all they are doing is adding 7 to the tens place or 1 to the hundreds place. I want students to be confident in using their knowledge of the place value system to add and subtract. Also to be able to recognize these types of problems and use their knowledge to simplify the task.

Rationale:

Common Core Mathematics Standards
- **2.NBT** Use place value understanding and properties of operations to add and subtract.
- **2.NBT.8**. Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.
 - **2.NBT.9.** Explain why addition and subtraction strategies work, using place value and the properties of operations.[1]

It is worthwhile for students to learn because most students do not recognize these trends on their own in second grade, if they are taught these techniques and understand the base ten system adding and subtracting will come much easier to them. Also it will help with future operations like multiplying by 10 means simply moving the decimal place one space to the right and filling it with a zero and dividing by 10 means moving the decimal place one space to the left.

Objectives for today's lesson:
   Content Objectives:
- Students will be able to mentally add or subtract 10 or 100 to any given number 100-900 using knowledge of the base ten place value system and prior knowledge of addition and subtraction facts 0-9.
   Language Objectives:
- Students will be able to verbally explain to a partner, using proper mathematics terms, why these addition and subtraction strategies work because of our base ten place value system.

Materials & supplies needed:
- Paper and Pencil
- Markers
- 1,10, and 100 unit counters
- Place value charts up to the millions place
- Blank math facts worksheet
- Cards with 3 digit numbers

Procedures and approximate time allocated for each event	Rational:
Launch (15 minutes)	
- Can anyone tell me what 1,560,342 + 1,000,000? Well at the end of this lesson everyone in this room will be able to add numbers like this and guess what you will be able to do it in your head! Do you believe me? Well I hope so, because I know you can do it and I am going to show you some fun tricks that make this problem quite simple"	- Telling student they will be able to such a difficult problem will get them excited about the task and interested to see what we are learning.
- Today we are going to work on mental math, which means math without a calculator, without paper and pencil, and without our fingers or number lines. I know it sounds a little tricky but as long as you know how to add and subtract 1, you can do it!	- This makes it clear to the student what mental math is and how they are expected to approach this lesson.
- I will say This idea of adding different base ten numbers is one of the foundations of our number system. Think of how hard this would be if we had to add roman numerals, our number system is set up so all we need to know how to do is add any number 0-9 to another number 0-9. That seems easy doesn't it? Even the money we use is based on the base ten number system. Think about it? Why don't we have $87 bills or a 39 cent piece? Also the idea of mental math is very important to you guys as future mathematicians. Being able to add and subtract without tools can be very important."	
- I will write the problem on the board lining up the numbers so the students will hopefully see how simple the problem really is, if not we have a whole lesson to teach them this concept.	- Writing the problem on the board will show student that all we are doing is adding 1 to a unique place value.
- Next I will ask students to count to 100 by 10's and 1000 by 100's. They should be able to do this with ease. I will next ask them to start at number like 78 and count by 100's from here or start at 26 and count by 10's. This may seem difficult initially but this aims at the main goal of the lesson it just presents the information in a more systematic and simplified way.	- Counting by 10's and 100's will illustrate adding 1 to then tens place and hundreds place in a familiar context. Starting at a number that is not ending in zero will make the connection between counting by tens which students are familiar with and the actual objective of the lesson.
- Next I will use their base ten blocks that are grouped in units of 1, 10, and 100 and make numbers on the ELMO. I will create a few random 3 digit numbers and add a 10 unit stick or a 100 unit block to the picture which will make it obvious how the number is changed. Students will be able to visualize how 642 can turn into 742 by the addition with a 100 unit block.	- This will build the topic further and the use of visuals will really help the ELLs. They will also make it quite apparent that we are just adding one because we will be adding or

- Individual white boards

- As I am doing this I will say "Okay can anyone tell me what number I have displayed here?" When they respond I will ask " How do you know that" I will then add a 100 unit block or a 10 unit stick and ask the students" Okay what number do I have up here now?" This will be a good way to scaffold the concept to the students because the ultimate goal is to be able to do this with mentally, but I believe it is important to model the concept to them with a visual and through example.

    o   *What prior knowledge do my students need?*
    The simple part of this lesson requires concrete knowledge of adding and subtracting numbers 0-9. The more difficult part calls for students who are confident in the base ten place value system. If they can understand that adding 10 is just adding 1 to the tens column and subtracting 100 is just taking 1 away from the hundreds they will be able to achieve the lesson goals. Students must also understand how to count by 10's and 100's.

    o   *How will I help them make connections to prior lessons or experiences?*
    I am connecting this lesson to prior experiences by scaffolding their learning using base ten blocks and counting by 10's and 100's something they are familiar with and have done in many past lessons.

    o   *How will I motivate them to become engaged in the lesson?*
    I will motivate my students to become engaged in the lesson by requiring all students to follow along with my board work by using their individual desk size white boards. Also I believe by telling them they will be able to add 1,560,342 + 1,000,000 will excite them that they can do such large math problems in their head.

Explore *(20 minutes)*
- **Describe how you will have students arranged**
  The students will be arranged in groups of 4. At six different tables in the room all of which will face the sides of the classroom so no student has their back to the teacher and the front of the room.

- subtracting 1 100 unit cube or 10 unit stick at a time.
- This will limit the time of teacher talk and make it a more student centered classroom.

- The students' will be in purposeful groups to help those that are struggling. The beginner ELL's will be paired with the more advanced ELLs

- *Describe the task the students will work on at this point in the lesson*
  Students will create 10 subtraction and addition facts for their partner to complete. They should try to challenge their partner using a variety of 0-9 number facts. Once both groups at the table have finished I will give them a deck of flash cards with a 3 digit numbers on them. The answer to adding or subtracting 10 and 100 will be on the back. Cards written in blue will require adding and cards written in red will ask for subtraction. This will allow students to practice their skills in a fun way, where they can get immediate confirmation of their accuracy without me present.

  - *Write out 3-4 ways the task can be solved.*
    This task is a little difficult to see students' methods because the goal of the task is mental math; however I plan to walk around as the students are doing their work and observe their methods and ask about their thinking.
  - Method 1: Counting by 10's or 100's. For example add 10 to 362 students will know 50..60..70 so it must be 372.
  - Method 2: Using base ten blocks. For example they are given the problem 483-100. They will take away 1 100 unit block and then count how many they have left resulting in 383.
  - Method 3: Mental math they will know that subtracting 100 means just taking 1 away from the one hundreds place.
  - Method 4: Writing the problem down and using standard methods of addition and subtraction to find the answer. For example

$$\begin{array}{r} 597 \\ +\quad 100 \\ \hline 697 \end{array}$$

  - *What errors might students make?*
    I think students will make errors with where to add or subtract the 1 when doing the mental math as mentioned above. I also believe that students may get confused when adding 10 to a number like 498 they may just add 1 to the tens place like I have illustrated and think the answer is

- so they feel comfortable asking questions in their native language if they do not understand.
- Creating their own facts will allow me to see to what level they understand the content. Also they can work together to check that they have the right answers. Giving the flash cards will allow students to practice their skills in a fun way and get immediate confirmation of their accuracy without me being present. Also this will limit disruptions for students who finish their work early.
- Brainstorming possible student solutions will help me to be better prepared to help students who are struggling.

- Thinking about student errors helped me in my planning to make sure to incorporate examples of problems where they may make errors so they

4108 instead of the correct answer of 508. I will try to avoid this error by doing a question like this in front of the class and reiterating to students that only 1 number 0-10 belongs in each space.

- *What questions will you ask to assess, focus, and advance their thinking?*
  I will ask students if to complete the initial question 1,560,342 + 1,000,000 after the lesson is complete and see if they can solve it mentally. I will also ask students since they can count by 10's and 100's can they count by 1000's and to create some problems of adding or subtracting 1000.

Specifically … (monitoring and supporting students' thinking)

- *As students are working independently or in small groups:*
  - *What will you see or hear that lets you know how students are thinking about the mathematical ideas?*
    I will walk around and observe students to see if they are using base ten blocks , writing the problem down, counting by 10's and 100's, just pausing and writing down an answer or using a method I had not thought of. I will ask students about how they got their answer and have them explain their though process to me, especially those students I see just writing down answers.
  - *What questions will you ask to assess students' understanding of key mathematical ideas, problem solving strategies, or the representations?*
    I will ask students "Are you confident you can do this for any three digit number? Okay if you can do that what if I asked you to mentally add 200 or subtract 20 do you think you could do that. I would then ask them a problem subtracting 20 and "How did you get your answer?" I hope they will answer "I knew it was just adding two to the tens place so I did that." This will tell me how they were thinking about the process and if they have not only understood the concept of 10 and 100 but that they can do mental math for all numbers ending in zeros. I will also ask students why they choose to use a specific method and how they knew their answer was correct. I will also ask them "Do you know why this works? I will also test their knowledge with a few larger numbers to see if they are intimidated by this or if they can still complete the task.

hopefully will not make them when they working independently.

- Asking students these questions will promote their higher order thinking skills.

- Walking around and observing the students will help me to informally assess students' ability levels and determine what types of problems they are having. Also how they are approaching solving the task.

- Having students explain how they got their answer will ensure that they have mastered the content and do not just have surface knowledge.

o *How will you ensure that students remain engaged in the task?*
     ▪ *What will you do if a student does not know how to begin to solve the task?*
     If a student does not know how to begin to solve the task I will set up the problem in a traditional way with one number written on top of the number as they would in traditional addition problems. If this does not work I will go back to some of the introductory methods of counting by 10's and using place value blocks.
     ▪ *What will you do if a student finishes the task almost immediately and becomes bored or disruptive?*
     I have given each table flash cards to practice their skills and gain confidence; I will encourage the student to complete all these problems. If they finish this I will challenge them to try and use 4 digit numbers and add or subtract 10,100, and 1000 or to try to mentally add or subtract other multiples of ten like 20 or 40.
	- If a student is stuck going back to a familiar method and linking it to the current approach is a way to make them feel comfortable with the new content.
	
	 - We will always have students of different ability levels so having extra tasks will keep these advanced students from becoming bored or disruptive.

Discuss *(15 minutes)*
   o *How will you get students' attention?*
   I will get students attention by using a responsive chant such as "one, two, three eyes on me" and them replying "one, two eyes on you. I will then make sure students are at least finished with answering their partners 20 questions.
	- Having a consistent attention getter will help student know behavior expectations.

Preparing your students to have a discussion:
   o *How will I structure the whole group discussion?*
   I will start by asking group questions about what students thought of the task, if it was hard or easy, if so what made it hard. I will take volunteers to answer my questions and encourage students to respond to each other opinions. I will then ask each group to give one of their questions to address to the whole class and each student will answer on their individual whiteboards. This will allow me to see all of their answers at once and check to make sure they are producing quality and successful work.
 	
   o *How will I help student-student interaction.*
	- I will try and foster student lead discussion have myself simply facilitate so they can learn from each other and their own exploration.

I will help students listen actively to each other by sometimes asking students to repeat what was said before them. Or requiring students to only build on their classmates comments, not allowing them to begin new topics without my guidance.

How will you orchestrate the class discussion so that you accomplish your mathematical goals?
Specifically:
  o *What specific questions will you ask so that students to promote higher order thinking.*

- I will ask students what then think it means for a number to be in the tens or hundreds place and give examples three digit numbers and tell me the value of the numbers in the 10's and 100's place.
- I will ask students what they think of someone else's method if they think they can use that method, or if they can think of a way to solve the problem in a more efficient way. I will also do a few incorrect calculations myself and see if students catch my errors this will show a true understanding of the concept if they are so confident in their abilities that they can contradict a teacher.

How will I summarize the main ideas of the lesson?
  • *How will I bring closure to the lesson and help children reflect on their experiences?*
    I will bring closure to the lesson by asking the students how they think they could use their mental math skill in real life situations.

- Requiring examples makes sure that student know what they are talking about.

- Students have to be very confident in their answer to correct a teacher. So if they point out these mistakes I will know they have mastered the content.

- Applying lessons to the real word give them meaning and purpose outside of the classroom.

Assessment

I will collect samples of students work to see if this is a topic they have understood. If all the students do not get at least 85% of their problems correct then this is a topic we will revisit. I will also have students create individual outcome sentences to let me know what they know, like, wonder, or are confused about after the lesson. If not I will use my notes on what methods students most often used to see how I can best teach new concepts based on what they are familiar using and what provides a challenge for them. As far as a

Academic, Social, and Linguistic Support during assessment

I will be walking around the classroom during the activity helping students with questions and observing their methodology. I will also serve as a facilitator during the discussion, clarifying student responses and pointing out errors noticed as to not single out students who made them. I will

| future lesson I would assume we would be working on adding and subtracting 2 and 3 digit numbers. I would use the methods that were most successful to teach these topics and students feedback on what activities they found helpful, engaging, and educational.	also do comprehension checks for students to signal to me if they are having trouble without having to explicitly tell me they do not understand.

Teaching Materials:

Individual white boards:

Base 10 blocks:
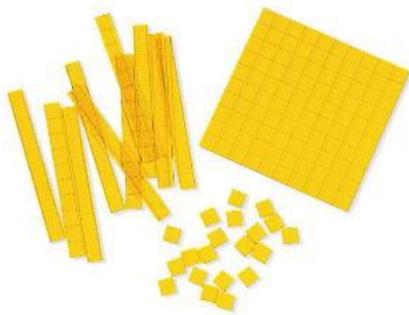
Elmo: Video projector:

Name:_____ Date:_____ Time:_____

Mental Math: Add and subtract 10 and 100

Write out 10 problems for your partner to practice mentally adding and subtracting 10 and 100. Make sure to include at least two of each type of problem and use a variety of numbers to challenge your partner. Once you have completed your partner's questions, check your answers together. Questions just raise your hand ☺ **If you finish early please practice with the flash cards on your table***.*

Examples: 157+ 100 = 257   989-100= 889   12- 10 = 2

1. _____ + _____ = _____

2. _____ + _____ = _____

3. _____ + _____ = _____

4. _____ + _____ = _____

5. _____ + _____ = _____

6. _____ + _____ = _____

7. _____ + _____ = _____

8. _____ + _____ = _____

9. _____ + _____ = _____

10. _____ + _____ = _____

Mental Math Flashcard Activity

     You each have a pack of mental math flash cards on your table. If you finish your worksheet early please practice your addition and subtraction of 10 and 100 with these cards. The cards have a number written on the front in one of four different colors.   Use the key below to tell you what to do with each card. Once you have figured out the answer using mental math flip the card over and check your answer!

Hot colors mean subtract: Red: - 100 Orange: -10

Cool colors mean add: Green: +10   Blue: + 100

Front side of flash cards

507   601

294   57

497   501

304   157