Lesson Plan SEMS 498 (Math)

Grade/ Grade Band: 6th grade math	**Topic/Title: Decimal Remediation**

Brief Class Description (contextual information including number of students, subject, level, IEP/ELL/GT or other special considerations):.

This class has about 25 students, one with an IEP. The re are several students clustered close together that easily distract each other. The teacher has a welcoming nature and the students are very comfortable in the classroom.

Brief Lesson Description (Overview/Abstract):

This lesson is a review of how to add, subtract, multiply, and divide decimals. Students will be doing a competition and then explore a handout followed by creating their very own word problem.

Objective(s):

Students will review how to add, subtract, multiply and divide decimals in order to deepen their understanding of how to perform mathematical operations using decimals.

Prior Student Knowledge:	**Possible Preconceptions/Misconceptions:**
Students should already know how to operate on decimals, since this is a review lesson	Multiplying decimals less than one will still be larger, dividing will be a smaller quotient
Common Core Standards: 6.NS.3 Fluently add, subtract, multiply and divide multi-digit decimals using the standard algorithm for each operation	**Standards for Mathematical Practices:** #1: Make sense of problems and persevere in solving them #6: Attend to precision #8: Look for and express regularity in repeated reasoning

Required materials:	**Safety considerations:**	**Technology Integration/Needs:**
Student Handout (35) Flash cards for game	Tournament may get a little competitive, make sure to have classroom management strategies to settle the students down	Projector

ENGAGE: Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions. Include timing/pacing, adaptations (IEP, ELL, culture, other) and transitions.
(5 minutes)(45 minutes left)

Set up: Students do not need to write anything for this. The teacher should prepare a powerpoint with the objective on it along with explicit instructions for following activities. The teacher also needs to have access to different coins. This can be pre-prepared as students will likely not have coins on them, or the teacher can ask the students if they have any change.

ENGAGE: The lesson will start by a student reading aloud the objective from the powerpoint, followed by a student paraphrasing it.

- *"Student A, will you read the objective out loud so everyone can hear it?"*
- *"Take a few seconds to think to yourselves, what does that mean?"*
- *"Who can tell me in their own words what they think this objective means we will do today?"*
    - **Instructional Strategy- Paraphrasing**

Then the teacher will ask the students if they have any change in their pockets. If they do, then the teacher asks to borrow it (promising to give it back) and this engages the students as they are a part of the production of the lesson. **(Instructional Strategy- Relatability)** If no students have change, then the

teacher has prepared different coins to show. On the document camera, the teacher will show each coin, one at a time, against a ruler. First the students can determine what decimal the coin itself represents, and then the teacher can zoom in on the document camera to allow students to determine what decimal the length of each coin is.

- *"Does anyone have any change I can borrow for the warm up today? I promise to give it back!"*
- *"Alright this is a quarter. What decimal does the quarter represent?*
- A quarter is 25 cents, so .25 or twenty five hundredths.
- *"Let me zoom in real close to this quarter and ruler for you. Now that you can see the length of the quarter, what decimal is the length?"*
- In inches, if we count it is 15/16 and we can use calculator to find that it is .94 inches. In centimeters it looks a little over 2 centimeters and if we could we can see the end of the quarter is about 3 tick marks away from the 2 centimeter line so the decimal would be 2.3 centimeters

Repeat for dime and penny. A dime in decimal form is .10, with a length of .68 inches or 1.7 centimeters; a penny is represents .01 and has a length of .75 inches or 1.9 centimeters. Then the students will get their coins back.

After students have determined the decimal form of those objects, the teacher will ask them what personal experience with decimals the students have, and why those experiences stick out. **(Instructional Strategy- Relatability, Think-Pair-Share)** The students will Think Pair Share for this, so they will think for 30 seconds, talk with a partner for 45 seconds about it, and then share with the class. A timer will be used. **(Instructional Strategy-Timer)**

- *"What personal experience do you have with decimals? Think for 30 seconds about some outside of school experience you have, and also think about why those particular experiences stick out to you."*
- *"It's been 30 seconds, so you should have an idea about a personal experience with decimals and why it's important to you. Now turn to your table partner and talk with them about what you came up with for 45 seconds."*
- *"Now that you've shared with your table partners, who would like to share with the class an experience they had with decimals in the real world?"*

Differentiation: The use of a timer lets students know how much time they have left to talk with their partners; having two students talk about the objective gives multiple perspectives on what the lesson is about; having the students actively participate in the production of the warm up interests them; and the use of the document camera and measuring in real time allows active participation.

Instructional Strategies: Instructional strategies used in this part of the lesson are paraphrasing, using student resources, and Think Pair Share. The students paraphrase the objective in the beginning of the lesson, this allows everyone in the class to hear a different perspective from the formal language of the curriculum. This can lead into instruction on the concept students will cover. Using student resources engages students and leads into the warm up questions covering the topic. The relatability leads to full student attention when instruction begins. Then Think Pair Share is an instructional strategy that allows students to work in a small group setting before sharing their ideas with a full class. This leads to full student interest and participation, and relatability in this case to the lesson that will keep the students focused when direct instruction starts.

Transition: *"Please get out your notebook or a sheet of paper for the next activity."*

EXPLORE/EXPLAIN Cycle(s)

EXPLORE: Include description of student centered tasks with information on timing/pacing, differentiation, material management, grouping, adaptations (IEP, ELL, culture, other), probing or clarifying questions with answers, and transitions.

(20 minutes)(25 minutes left)

Set up: The teacher prepares a large set of flash cards that include adding, subtracting, multiplying and dividing decimals, each of various difficulties. The powerpoint should also have a slide with explicit instructions for the tournament on it.

EXPLORE: (Instructional Strategy-Decimal Tournament): The teacher will show the powerpoint with explicit instructions on how the game is played. For each round, one table of people will come up and complete a problem. Then the next table of students, etc. Once the whole class has gone, the winners from the first 4 tables will come up and compete against each other, and then the next 4 tables, etc. Slowly the number of students competing will decrease until there is a winning student who wins bragging rights. During each round, a flash card will be presented and the students will compete to complete the problem correctly first. While these students are competing, the other students in the class will also be solving the problem. It will be heavily implied that some of these problems will be important later in the lesson, so the students are responsible for doing them. The flash cards range from easy to difficult, and they are presented in a random order. The flash cards should NOT be ordered so that students in later rounds get more difficult problems, as the purpose of the game is for all students to practice manipulation of decimals. The teacher should constantly be making sure all students are completing all problems.

- *"We are going to have a Decimal Tournament today. This has very specific rules, so you need to listen to the instructions so you know how to play."*
- *"I have here in my possession a bunch of flash cards of varying difficulties. These are random, so you could get an easy problem or a difficult one, and doing it randomly is fair."*
- *"Every round a new flash card will be presented. At the beginning each table one at a time will come up and compete against each other to see who can complete it the fastest, but it must be correct!"*
- *"After everyone has come up and competed, then the winners from each round will compete against each other, and eventually we will have a tournament winner."*
- *"The prize is a secret."*
- *"There is a tape line on the floor, competitors need to start behind the line and then run to the board to complete the problem."*
- *"While other tables are competing, you need to be writing these problems down as well! That is why I asked you to get out a sheet of paper earlier. You will see these problems again so it is in your best interest to be writing them down."*
- *"Are there any questions?"*

Differentiation: Using a powerpoint and verbal instruction gives students multiple representations. Having the students get up out of their seats and run to the board expels their energy and brings out their competitive spirit.

Instructional Strategies: The Tournament is a big instructional strategy in this part of the lesson. It interests all types of students and allows them to learn and practice while also having fun.

Transition: *"Your prize is this high five and bragging rights that you won! Congrats! Now everyone take your seats and lets move on."*

EXPLAIN (STUDENT CENTERED): Include description of cognitive outcome (concepts and

vocabulary), student centered explanation (tasks) with information on timing/pacing, grouping, adaptations (IEP, ELL, culture, other), probing or clarifying questions with answers, and transitions. Also include "look fors" and how this part helps students "bring the pieces together". (10 minutes)(15 minutes left)

Set up: The teacher prepares a worksheet with 5-6 problems on the front covering operations on decimals. **EXPLAIN:** The teacher has two students get up and hand out the worksheet to all students. Students are instructed to complete only page one of the handout. **(Instructional Strategy-Think Pair Share)** They are given 2-3 minutes on the timer to complete the worksheet individually, then another 2 minutes to complete it in small groups meaning with a partner or at their table. Students may not move around to be with friends. After these 4-5 minutes are up, whether or not students are completely finished, we will go over answers as a class and have small discussions about them. After all the questions are answered, the teacher will ask probing questions such as "How can estimation help solve for an answer?" and "what causes a decimal product to be smaller or larger?" **(Instructional Strategy-Cold Call, Thumbs up/down, Turn and Talk)**

- *"Student A and Student B are handing out a worksheet now. As of this moment, you are only to complete the first page! You can see it has a stop sign at the bottom TO STOP YOU."*
- *"I will set the timer for 3 minutes for you to work individually on this front page. Start."*
- *"Now that 3 minutes are up, you can work with your tables for another 2 minutes if you would like. You may not move around!"*
- *"Even if you aren't finished, we are going over the answers now and I would like you to follow along. You had some time in your small groups to compare answers, so it shouldn't matter on who I call* (Cold Call). *Student M, which number would you like to do?"*
- Alternate
- *"Thumbs up if you agree with that answer, thumbs down if you don't. Why or why not?"*
- *"Hold a number to your chest, so only I can see it. Pointer finger for agree, two fingers for disagree. Why or why not?"*
- *"Now that we've gone over the answers to the front of the worksheet, lets ask some questions. Before I ask mine, does anyone have any?"*
- *"How can estimation help me come up with an answer? Turn and Talk for 1 minute."*
- *"Student K what did your table come up with?"*
- *Why does a decimal product get bigger or smaller? Think and then share with your table partner."*
- *"Student D what did you and your partner think?"*

Differentiation: Having instructions on both the handout and verbally as well as on the powerpoint help with multiple representations. Using a timer helps chunk work so students do not get overwhelmed and working in small groups helps students feel more confident.

Instructional Strategies: In this part of the lesson, the individual and then small group work is much like Think Pair Share, which gives students the opportunity to feel confident in their answers before they get called on as well as comparing and debating solutions. Cold Call after the adaptation of Think Pair Share makes the students accountable for having answers and completing their work, but allowing students to choose what problem they do gives them a bit of comfort. The agree disagree method with thumbs up/down and fingers up lets the teacher know which questions to spend more time on because more students may not understand or have similar answers, so this provides opportunity for further instruction. Turn and Talk is a good instructional strategy to allow students to feel more comfortable sharing their answers with the whole class.

Transition: *"Remember those experiences we talked about at the beginning of class?"*

ELABORATE: Include description of applications and extensions tasks with information on timing/pacing, differentiation, grouping, adaptations (IEP, ELL, culture, other), probing or clarifying questions with answers, and transitions.
(8 minutes)(7 minutes left)
Set up: Students have already been given the worksheet they need to complete this part of the lesson.
ELABORATE: (Instructional Strategy-Turn and Trade) On the back side of the worksheet students have already been given, there is a list of instructions for what they need to do. Students will popcorn read the instructions. Students are to make up a real world word problem based on their personal experience with decimals that they talked about with their partners earlier in the lesson. The word problem cannot be the exact situation they were in, but it should be similar and incredibly detailed. Students will have a space to write on their worksheet

- The personal experience they talked about earlier with specific details
- Their first draft word problem
- Second draft word problem

Students will have 4 minutes (with timer) to come up with their word problem, and then they will Turn and Trade their word problem with one or two people at their table depending on if they are at a table of 3 or 4 students. Once they get their partners word problem, they will read it and then write in that chunk of space 1 thing they like and 1 thing that could be improved. Then the students trade back and the original maker of the word problem makes their second draft.

- *"Turn to the back of your worksheet. There are specific directions that we will go over. Who would like to read the first line?"*
- *"Okay Student I popcorn to someone else."*
- *"So you should use your personal experience to make up a word problem, then trade and critique, then trade back. I'm putting 4 minutes on the timer for you to make your word problems. Go."*
- *"4 minutes is up, please trade with one or two people at your table and critique their word problem. Remember 1 thing you like and 1 think that could be improved!"*
- *"Time to trade back papers!"*
- *"Take the next 1.5 minutes to write your final word problem, and solve it!"*

Differentiation: There are instructions given to the students on the handout, on the powerpoint, and verbally. The use of a timer allows chunking so students do not get overwhelmed, and the turn and trade allows students to give each other informal feedback instead of the teacher.

Instructional Strategies: Students making their own word problems allows them to relate the content to their own lives, especially since the word problems are based in their personal lives. Then the Turn and Trade lets students critique each other without anxiety and engages the students in their own production of word problems.

Transition: *"Let's use these word problems we just made!"*

COGNITIVE CLOSURE (aligned with objective(s):
Reminder: A learning ticket is not considered a cognitive closure by itself.
(7 minutes)(0 minutes left)

Set up: Students will use the worksheet they already have and a lined piece of paper for their word problem.

CLOSURE: (Instructional Strategy-Trade and Grade) Students will write their word problem without the solution on a lined piece of paper, and then trade papers with students at a different table since the

people at their same tables have already seen their word problems. Then after they trade, they will solve the word problems that they were given. The timer is set for 4 minutes to give the students enough time to complete the problem, and then the papers are given back to the owners after the completing student writes their name on the paper. Then the students check or x the solution and write why. This will take about 30 seconds, and then students who traded papers will get together and explain why the solution was what it was. If they got it right, then the students will talk about what caused the answer mathematically and if they got it wrong they will explain why and how to get the correct answer. The explanations will be summarized on the papers and then handed in to the teacher.

- *"Now we will write our word problems, without the solution, on a lined piece of paper. Leave room for an explanation later!"*
- *"After you're done writing, turn to the table next to you and trade papers with a person at that table. Write your name as the trading partner on the paper you're given, and solve the word problem. After you're done that, your will trade back and your solution will be graded by your partner and then you two will get together and write/explain the solutions."*
- *"You have 4 minutes to solve. Go!"*
- *"Now give your paper back to the maker. Once you have your paper, give a check or and X, and then get together with your partner and explain the solutions. If you got it right, then talk about what caused the answer mathematically. If you got it wrong, explain why and how to get the correct answer. Go!"*
- *"Now that you're done, you are handing your papers in."*

Differentiation: Directions will be verbal and on the powerpoint for multiple representations, and there is informal critique to curb anxiety.

Instructional Strategies: the Trade and Grade strategy lets students relax while also giving the teacher the opportunity to evaluate student knowledge.

EVALUATE:

Diagnostic Assessment(s): To gauge student knowledge, during the engagement phase I observe which students really understand the decimal form of coins and length.

Formative Assessment(s): The students turn in their personal experience word problem so I can evaluate their understanding and the completion partners understanding.

Summative Assessment(s): N/A

Timing/Pacing Adjustments (Slinky Time): Include a plan for how to adjust instruction if tasks take longer/shorter than anticipated:

If the lesson goes longer than expected, the students do not have to Trade and Grade papers instead the students will just hand in their own word problems with solutions on them. This will take off about 5 minutes.

If the lesson goes longer, we can trade papers to critique the production of word problems more than once,

so the students critique two different word problems. This would add about 5 minutes.