

Lesson Plan (Math)

Grade/ Grade Band: 6 th grade		Topic/Title: 10.2 Evaluating Expressions Day 2	
Brief Class Description (contextual information including number of students, subject, level, IEP/ELL/GT or other special considerations):			
Mod 1: There are 26 students in the class, 3 with accommodations. Student accommodations include one student who is allowed to have a scribe if needed, one student who gets extra time on tests and a reader if needed, and another student who gets extra time on tests and preferred seating. This class can be loud if left to work and must be brought back into focus, and they get distracted easily. The students cannot do one activity for too long or they get bored and stop paying attention or start horsing around. There are several students who need extra help understanding but do not have IEPs. There are also a few students who are bright and finish early, with one in particular who finishes everything incredibly early but do not like to show work on his/her paper. In this classroom the desks do not have drawers or another space for students to keep their belongings so the floor and walkways are littered with device bags and binders, and it can be difficult to get around certain tables.			
Mod 2: There are 22 students in this class, and 4 of them get accommodations. All of those students get extra time on tests, and then one of them always works individually, one of them always gets a calculator to work with, one of them gets small group work, and one is diabetic. The student that works individually is allowed to draw while he/she works. This class is quieter in the beginning of the period but the students get more comfortable once time goes on, though they are quieter than Mod 1. There are multiple friend groups as well therefore some students need reminders to focus on work instead of socializing. In addition there is a student who needs a constant reminder to focus on his/her work and can be a distraction to other students. There is also another student who does not do his/her work because he/she does not feel the need and therefore requires prodding to do said work.			
Walkways are hard to get through because the trailer is small.			
The technology accessible in the classroom is a projector at the front center of the room which can be accessed through a BCPS device.			
Brief Lesson Description (Overview/Abstract): Students will play Around the World to practice evaluating expressions and then create and critique word problems that result in expressions using phrases.			
Objective(s): I can evaluate expressions at a specific value by participating in a competition.			
Prior Student Knowledge: Students know how to write and model expressions, and they have learned how to evaluate expressions in the previous lesson. They also learned and practiced Order of Operations the previous week.		Possible Preconceptions/Misconceptions: Students may not be able to figure out expressions from word problems.	
Common Core Standards: 6.EE.2.C: Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real world-problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).		Standards for Mathematical Practices: Construct viable arguments and critique the reasoning of others. Model with mathematics. Attend to precision.	
Required materials: Flash cards with expressions and numbers Drill half sheet		Safety considerations: na	Technology Integration/Needs: Projector

White boards, markers, erasers		
<p>ENGAGE: Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions. Include timing/pacing, adaptations (IEP, ELL, culture, other) and transitions. (10 minutes)(40 minutes remaining)</p> <p>Task: Students will complete a small set of practice problems to help them get better at evaluating expressions. This practice half sheet will be picked up by students on their way in. Projected onto the board will also be instructions to get a white board, marker, and eraser. After a few minutes of working independently, I will go to the projector with my own half sheet and go through the answers. If there any questions, students will ask at this time. I will say “Here are your predictions about Evaluating Expressions from yesterday. What would you change since then?” The predictions are on a Padlet that I will access only. I made the Padlet yesterday when the students were asked to predict what it might mean to evaluate an expression.</p> <p>This allows students to critique their own and their peers and creates relatability to the lesson. After this I will have students copy their homework, read the objective, and go through any changes in the schedule.</p> <p>Instruction: Teacher instruction Student Answers (pacing from the most recent time) <i>“Please pick up the drill on your way in and complete it.”</i> <i>“Let’s go through the drill! Student A, what did you say for number 1?” (3 mins)</i> Repeat for other drill problems <i>“If you have questions about the drill, you can come see me later or look through your notes for an answer.”</i> <i>“Alright, yesterday, we talked about evaluating expressions; remind me what it means to evaluate? I remember Hailey saying a couple of great one word definitions.” (4 min)</i> <i>“Yesterday when we said this it was wrong, now we know.....”</i> <i>“Awesome!! If you haven’t already, please copy down your homework. It’s the same as last night so if you haven’t done it write it down, if you did please still get out your agenda and write NONE. Will someone who has already copied the homework read the objective?”</i> <i>“I can interpret expressions through phrases in order to practice evaluating.”</i> <i>“Thank you! I wonder what we’ll be doing...Hm. Now take a look at the schedule. It too hasn’t changed since yesterday. Are there any questions about the homework board or schedule?” (3 mins)</i></p> <p>Transition: “Please get out the worksheet titled Expressions Practice that you picked up on your way in.”</p> <p>Instructional Strategies: Predictions Critiquing Technology (Padlet)</p>		
<p>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. (15 minutes) (25 minutes remaining)</p> <p>Task: Students will pick up a worksheet with a set of expressions on their way in. These expressions are the same as the ones I have put on flash cards. I also have another set of flash cards with “$x =$ a number” on them. The number of the unknown will vary. Using these flashcards and the projector, students will play a game of Around the World; where one student starts behind another’s chair and whomever holds up the value of the expression on a white board moves on to stand behind the next student. If a student moves on but then loses the round, they sit in the winners seat. I will mix up which set of flash cards I change, so that</p>		

Comment [CT1]: Questioning. During implementation, I had the rest of the class nod if they agreed and then for others I had them do the sign for yes in ASL if they agreed. I did this instead of asking “why” or “how did you get that answer” for time reasons, but these drill problems had one word justifications, so it would have been better if I had also asked for a justification. I also in the future should offer a shake of the head for disagreeing and the sign for no in ASL.

one expression could be used with different numbers for a time, and/or one number could be used with multiple expressions for a time. The expressions will randomly vary from simple to mildly difficult, since students have already learned how to simplify using Order of Operations. I will intend to get to every student during the game, but if they do not want to participate on the spot they have the option of passing. However, the worksheet that students picked up requires them to complete at least one version of each expression (meaning using one number **projected at least**). This will not only allow them to practice but will make sure they are on topic during the game when it is not their turn. **Students must be paying attention to whichever expression comes next in case they need to evaluate it on their paper. This game will be played for 10 minutes.**

I fully expect for students to need instruction about this game as my mentor teacher had never heard of it. Based on this I assume it has not been played often in the middle school setting, although it may have in elementary school. If a student knows the rules, I will invite them to explain, and follow up with my own succinct explanation of the game. This will go along with at most 3 practice rounds. This explanation should take no more than 5 minutes.

Expressions: $x + 3$; $2(x) + 7$; $17 - x$; $x \div 2$; $3 * x \div 1$; $(3 * x) + 2$; $5 + x - 4$; $4(x) - 4$; $10 \div x$; $12 - x(3)$

Instruction:

"Has anyone played Around the World before?"

"Would someone who has explain to the people who haven't?"

"The first person stands behind the next persons chair, and they look at the flash card and try to get the answer first. If the person standing wins, they move to the next person. If the person sitting wins, they move to the next person and the person who was standing sits in their char."

"Good explanation! I will add on a few things. Your paper in front of you has all the expressions we will be doing, but I have all the numbers. You are required to fill in each of the expressions at least once with a projected number, so you can't go doing this paper before we get to the expression. I will be collecting that, so make sure you are paying attention! Also, if you just want to participate through doing the paper, not doing white board work that is okay. Just say "pass please" when we get to you. We will do a quick practice before starting for real. We are playing for 10 minutes, I am setting the timer! Whether we get to everyone in the class depends on you. Ready?" (5 mins)

Transition: "Our ten minutes of playing this game is up! Please return to your original assigned seats and think about if you want to go over any of the expressions because you are confused, it was difficult, things like that."

Differentiation: If a student does not want to participate in Around the World with white boards, they do not have to. They can simply say "pass please." The flash cards will have very big font for students in the back of the classroom to see clearly; and students do not have to write down every single problem that is projected. If a student loses a round and wants to go sit back in their own seat instead of the winners seat, they may do so. If a flash card is presented and no student answers within 15 seconds, it will become a free expression and other students in the class may hold up their white boards. This will not reward them in any way, but it is good practice and makes sure students are paying attention. If a student does not wish to participate at all in the game, I will ask them if they would still participate with white boards but pass when they are put on the spot. They may go onto the back of their worksheet and write down other projected expressions (similar expressions with different numbers projected) when they are out of space on the front.

Instructional Strategies:

Around the World

White Board work

Use of Timer

Comment [CT2]: Instruction/ Time Management:

As each round happens, the person who won that round (answered the expression evaluation correctly), they should go the nearest edge of the room and hold their white board up and around for the rest of the class to see how they did their work. During instructions I would model this so that students knew what to do and what their answers should like. This would make the game longer, but discussing the problems would be eliminated.

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”.

(12 minutes with instruction and questions) (13 minutes remaining)

Task: After 10 minutes of the game, all students will go back to their original assigned seats. Using their worksheets we will discuss 2 of the problems as a class. At this time I will also instruct students to choose one expression/evaluation and write a phrase for it. This is a review of phrases from yesterday. Examples include “the sum of five and three is eight.” After this I will take 2 volunteers to share their chosen phrase. At this time I will take any questions students have about the 4 reviewed problems and phrasing expressions. After all questions have been answered, I will check for understanding with a “fingers to chest” strategy. 1

finger=very confident, 2 fingers=unsure, 3 fingers=I have no idea what I’m doing. Then based on the homework from two nights ago, students will be put into groups. If they got a 3,4, or 5 out of 5 on the homework they will come with me to do desk work. If they got anywhere between a 0 and 2, they will go with my mentor teacher for extra help. Students doing desk work will be put (by me, previously prepared) into heterogeneous pairs, meaning a person who got a 5 will be paired with someone who got a 3, and so on. The students who are paired with a lower number are the “expert” in the partnership. Then I will project problems from the book that I have already chosen, and students will complete them as practice with white board markers, drawing on the desks. The “novice” of the group will be required to ask questions to the “expert” before they ask me. The answer key will be projected after about 5 minutes so the pairs can discuss what they did correctly and incorrectly. Desk work and extra help will be done for 8-9 minutes.

Instruction:

“I am taking 2 problems that you want to review because you are confused. Which ones are we doing?” (1.5 mins)

“I would like you to please choose one expression from your paper and write it in a phrase like we learned yesterday. Remember, an example would be ‘the sum of three and five is eight.’ Take a minute or so to do that.” (1 min)

“I will take 2 volunteers to share what expression they chose and how they phrased it.”

“Awesome job you two! Are there any questions about the 2 expressions we went over or the phrasing?”

“Okay now if you are very confident with evaluating expressions, hold up 1 finger to your chest. If you are still a little unsure, hold 2 fingers to your chest. If you have no idea what you’re doing, hold 3 fingers to your chest.”

“Those of you holding up a three, please make an appointment with me for lunch help! I am always available to help you.” (2 mins)

“I am now handing your homework back from two nights ago! If you got anywhere between a 0 and 2 you are to go see [mentor teacher]; if you got a 3,4, or 5 you need to come to this side of the room.”

“These are the partners I am assigning.”

“I am coming around with white board markers and erasers. Once you get them, please work in partners to complete the projected problems. Please try to figure out the work together before asking me any questions!” (7 mins)

“Alright desk work people, I am here with cleaning wipes for you to clean your desks, and put the markers and erasers away and go back to your seats please.” (1 min)

Transition: “Please get out a separate sheet of blank paper. If you do not have any, there is white paper in the materials corner.”

Differentiation: If a student is sitting at a table alone, they can change papers with a table next to them or

Comment [CT3]: This would be unnecessary if students held up their white board work during the game.

Comment [CT4]: During implementation, I did a thumbs up/down instead. In the future I would like to do this instead.

Comment [CT5]: Pairs of students should do work on only one desk, to ensure they are working collaboratively.

they can write an expression and phrase for their own word problem. If this is done, that student must also write down a justification that his/her answer is correct.

Instructional Strategies:

Fingers to chest/Checking for Understanding

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) (5 minutes remaining)

Task: Students will get out a sheet of separate blank paper and create their own word problem. Once they are finished their creation, they will give it to the person that sits next to them to evaluate. Evaluations include writing the correct expression with the correct phrase that corresponds (i.e. $9 + 6 = 15$ and the sum of nine and six is fifteen). After each student is finished evaluating they will give it back to the original creator and the two/three will critique/give feedback to each other.

Instruction:

*"On your blank separate sheet of paper, create your own word problem. Your problem must ask for an evaluated expression and a phrase for it. I have a couple examples up here if you would like to change or adapt it to what you want, but **you will not use these**. After you are finished your creation, give it to the person next to you to solve. After the two of you are finished solving, give them back to the original owner and give feedback or critique a little bit. This should be friendly! I am putting 3 minutes on the timer for you to create, so when the timer goes off you should be handing your paper to your partner or have already done so. Go ahead!" (3 mins)*

"Your 3 minutes is up! I am now putting 2 minutes on the timer for you to evaluate the word problem." (2 mins)

"Your 2 minutes is up! Now I am putting 2 minutes for you all to give feedback." (2 mins)

"Would any pairs like to share one word problem and the solution?" (1 min)

Differentiation: I will model a few word problems on the board and students may adapt one of them if they wish to.

Transition: "Please reread the objective."

Instructional Strategies:

Creating a word problem

Critiquing others

COGNITIVE CLOSURE (aligned with objective(s):

Reminder: A learning ticket is not considered a cognitive closure by itself.

(5 minutes)

Task: Students will GUS themselves about Module 10 so far: G-I was guessing the whole time; U-I am still unsure; S-I am sure. Based on this self-assessment, students will go to one of three corners with others of the same "GUS". Then from each corner, one person will do a deeper self-assessment and explain why they feel the way that they do. In their corners, one person will volunteer to share if they think we completed the

Comment [CT6]: Questioning: Instead of having one student go deeper, The students in the G and U corners can ask a couple of questions that the students in the S corner can answer. This will provide more student to student interaction.

objective for the day.

Instruction:

“Take a few seconds to self-assess yourself into one of three categories. I was guessing all of today’s class; I am still unsure about equivalent expressions; and I am sure and confident.”

“Now the GUS folders are in three corners. Go to your specific corner NOW.”

“Student M, why are you in the U corner?”

“Student S, why are you in the S corner?”

“Student Z, why are you in the G corner?”

“If you are in the G or U corners, sign up for lunch help before your test! I am available to help you!”

“Student L did we complete the objective today, also how?”

Instructional Strategies:

Self-Assessment

EVALUATE:

Diagnostic Assessment(s): The previous day, students made predictions about evaluating expressions. For this lesson, students critiquing and fixing their mistakes is also a way to see what they’ve learned and comprehended. The drill at the beginning is also a way for me to gauge what they can accomplish.

Formative Assessment(s): Around the World is an observational formative assessment because since students are using white boards I can see what work they did. Questions time during the Explain portion of the lesson is also a time for formative assessment/checking for understanding before moving to the creation of word problems.

Summative Assessment(s): Unit 4 Test

Timing/Pacing Adjustments (Slinky Time): Include a plan for how to adjust instruction if tasks take longer/shorter than anticipated:
If time is running out, instead of creating a word problem my list will simply be projected and students will volunteer to state the expression and phrase for them. (-3 mins) Students may also not share their self-reflections with partners and instead share out loud their own. (-3 mins) If there is more time than usual students may volunteer to share their word problems out loud and their partner can share the expression with phrasing they thought it was. Then the whole class can do a thumbs up/down to agree or disagree with the partner. (+7 mins)

Comment [CT7]: Instruction: During implementation I broke down the objective, when in fact I should have asked “do we understand more than we did before?”

Comment [CT8R7]: Instruction: I also had the rest of the class do a thumbs up to agree that we completed the objective. However it sounded like I did not give them a choice of thumbs up or down, so it is possible for students to put a thumbs up even if they did not agree. This can be remedied with a simple “Thumbs up if you agree, thumbs down if you disagree.”

