Lesson 1

Evaluating Expressions

Components:

Class:

 Subject: Math

Level of Students: General Education

Grade: 6th

 Number of Students: 24

Standards:

[CCSS.Math.Content.6.EE.A.2](http://www.corestandards.org/Math/Content/6/EE/A/2) Write, read, and evaluate expressions in which letters stand for numbers.

* [CCSS.Math.Content.6.EE.A.2b](http://www.corestandards.org/Math/Content/6/EE/A/2/b) Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms*.
* [CCSS.Math.Content.6.EE.A.2c](http://www.corestandards.org/Math/Content/6/EE/A/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). *For example, use the formulas V = s3 and A = 6 s2 to find the volume and surface area of a cube with sides of length s = 1/2*.

[CCSS.Math.Content.6.EE.B.6](http://www.corestandards.org/Math/Content/6/EE/B/6) Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

[CCSS.Math.Content.6.EE.C.9](http://www.corestandards.org/Math/Content/6/EE/C/9) Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.

CCSS.Math.Practice.MP1 Make sense of problems and persevere in solving them.

CCSS.Math.Practice.MP2 Reason abstractly and quantitatively.

CCSS.Math.Practice.MP4 Model with mathematics.

Topic: Evaluating Expressions

Rational: The reason it is important for students to learn this topic is because it has many real life applications, like in economics and nutrition. Also it will be useful to successfully complete these problems in order to be able to move on to higher math.

Concept Definitions:

* Variables- a quantity (usually a letter) that assumes a value or set of values
* Expression- a mathematical phrase with no equal sign

Concept Definitions (cont.):

* Linear equation- a mathematical statement with one variable and has only one solution
	+ To find the solution, first simplify by using the properties and the order of operations to connect like terms. Then the variable must be made to stand alone by using inverse operations.
	+ When you solve a two-step equation it is very similar. You must get the variable alone on one side of the equation by reversing the order of operations.

Objectives:

1. After watching a video and classroom discussion and practice the students will understand and be able to solve at least 85% of their evaluating equations quiz correctly.
2. Student will also be able to apply their knowledge to real life situations and present and defend their work to their peers and/or teacher.
3. Students will remain diligent in their work throughout the lesson, ask questions when appropriate, and volunteer to do sample problems when asked by the teacher.

Evaluation:

I will evaluate the students on how well they completed their quiz. If they completed 100-80% correct they will get a four, 79-60% a three, 59-40% a two, 39%-20% a one, and 19% or less a zero. I will then look at the problems they create to see if they are using the correct vocabulary and are able to understand the task of evaluating expressions well enough to apply it to the real world. I will also award in class points if the students are working quietly and cooperatively, if they volunteer to do sample problems, if they ask questions and are an active learner, and if they do not disrupt class.

Procedure:

Introduction
I will ask the students to watch a video on the SmartBoard that is about evaluating expressions from the Khan Academy website. I will have the students follow along in their math notebooks, taking notes and doing any sample problems that are presented in the video. Once it is over I will introduce the topic of evaluating expressions.

Instructional Procedures

1. I will start by distribute the white boards, markers, and paper towel for them to use as erasers.
2. I will then review writing and solving one-step and two-step equations
3. I will then ask the students to demonstrate the following on their whiteboards:
	1. x=3 y=3 z=5
		1. 2x+3
		2. z-y
		3. (z+1)x
	2. Joe has a lemonade stand. He sells small glasses for $1 and large glasses for $2. How much money will he make if he sells 8 smalls and 5 larges?
4. I will then ask the students to login to their Edmodo accounts on the iPad minis and find the online quiz posted on their page.
5. Then the students will work through the online quiz from Khan Academy on the iPad minis.

Conclusion:

Once the students have completed their quiz I will collect their iPads and look at their results to see the areas where they struggled. I will then have them talk to a person sitting next to them and discuss what they did well, what they struggled with, and see how they can improve. They will then turn in their whiteboards and clean up any other materials they have left out. I will finish by seeing if anyone has any questions and discussing what we will be doing next time in class.

Materials:

* 24 white boards
* 24 markers
* Paper towel
* 24 iPad minis

Differentiation:

I will go at a pace that every student can keep up with and work at. If I feel that we need to slow down I can easily break this lesson into two parts. Also if we don’t have enough materials for everyone I can combine groups. I will also make sure to supply stimulation for each student’s learn needs (visual, auditory, and kinesthetic).I will also be available during class and before/after school for additional support if the students need it.

Grouping: I will group the students heterogeneously because I want them to work cooperatively in order for them to assist their peers if necessary, to work on their social skills, and to have a variety of thinkers in one group.

Texts: I will provide review worksheets if students need more help evaluating expressions.

Reteach:

I will use the algebra tiles to review one-step equations as well as two-step equations. I will then go through a review worksheet with the child working through the step by step process. I will do this either before or after school during Math Club hours.

Extension:

I will ask my students write 3 real life situations that would ask them to use the skills that they just developed. Then their peers will attempt to solve these problems.

3. The students had already been introduced to the idea of evaluating expressions and using variables in their math class. When doing the review problems in the beginning 90% of them got all of the problems correct. The rest of the students needed a few reminders but were ultimately successful. Many of them had never written math problems about evaluating expressions before. There were able to recognize the problems when presented with them but they had never written them before.

4. I was able to see that my lesson was successful in getting the content across but the real life connection was not made. The students were able to complete all of the problems and were able to answer them correctly which shows that they were able to take their previous knowledge and apply it. This shows that they are retaining the information they are learning and that they have met the first for of the content objectives I had. When asked to make real life connections the student could not do that. They did not make connections to use expressions with variables to solve problems dealing with money, food, or other experiences they might have had. This shows that they were unable to meet the last practice standard and will need to work to develop those skills.

5. My students were able to demonstrate some of the practice standards. They were able to work through the problems that they were given and solve all of them. They also were able to think quantitatively but struggled to think in abstract ways. When they struggled with thinking abstractly they were confused about how to relate the problems to real life situation and missed the correlation between their practice problems and real world situations. They also were able to model math by creating their own problems. I observed this by walk between the students and talk with them, listening to their conversations, and seeing their final scores on the quizzes. I also read their math problems that they created which showed areas where they struggled greatly.

6. The students were very engaged throughout the lesson. While watching the movie they participated in the example problems. They also would ask questions when they were doing the practice problems on their white boards and during their quiz. They wanted to do well and demonstrate their learning so they would try very hard on every question and would work until they got it correct. They also tried to manipulate the problems when they tried to create their own. After the lesson they even came and told me how much they enjoyed the lesson.

7. Some of the instructional strategies that seemed to work the best were the white boards and having them work in pairs. They were eager to do the problems and wanted to be successful. They also knew that if did not pay attention when I presented the questions they would miss them which kept them relatively quiet. When they worked in pairs it allowed them to use their peers as a resource and work to figure out where they would mess up in a problem or ask for additional help if I was unavailable. I enjoyed using the SmartBoard to present the video to the children because it was big enough for all the kids to see and was a good way to teach as a whole group. I also like working with the iPad minis as well since they seemed to get the kids excited for the lesson.

8. One of the instructional strategies that I did not like was the quiz that the children had to complete. The quiz was given to me by my CT and she asked me to use it as a way to assess the students. There was a button that the children could use when they need some extra help on their problem. However if they continued to press the button it would ultimately give the student the answer. One of the students figured this out and then stopped trying on the problems and would just continuously push the button until she got the answer. I want the children to really try and know what they are doing when solving math problems, this button gave them a shortcut.

9. A classroom management strategy that worked well was splitting the students into smaller groups before completing this task. It gave me my more time to focus on some of the students that needed more individual attention. I also liked having the students gather around the SmartBoard while we watched the opening video. It was easier for me to observe their note taking skills and see how they did on the practice problems. It also allowed me to stop any disruptive behavior.