**Lesson Title:** Solving linear equations and inequalities in one variable

**Unit Title:** Solving equations and inequalities in one variable

**Teacher Candidate:** Maira Carmona

**Subject, Grade Level, and Date:** Algebra 9th grade, February 2, 2014

**Placement of Lesson in Sequence**

This lesson is based on solving equations in one variable. Students will first learn how to solve one-step and then two step equations and then inequalities. This lesson comes after learning expressions from word statements. For example, students already know that adding 3 to *x* and then squaring the result is the same as (*x*+3)2. Students have also worked with finding *x* such that the expression equals a number. For example, they have seen problems such as: for the expression *x* – 3, find *x* when the expression equals 20. This time, students will work with the actual notation and learn the process involved in solving for *x*.

**Central Focus and Essential Questions**

The central focus of the lesson is to engage students in learning how to solve equations and inequalities in one variable. Students will learn the process and gain practice using an interactive website that will make it fun for them to learn. Some of the essential questions include, what should be the first step in solving this equation? What will happen if you only perform that operation on one side of the equation?

**Content Standards**

CCSS.Math.Content.HSA-REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

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| **Learning Outcomes** | **Assessment** |
| Students will identify and explain the process to solving linear equations and inequalities in one variable.  Students need to understand that performing an operation on one side of the equation means performing the same operation on the other side, too. | Students will be assessed throughout the lesson. Students will work with a partner on the ‘oral practice’ activity and then as a class. I will be walking around listening as their practicing to make sure they are on the right track. Students will also work on practice problems on an interactive website. The website will tell their score on the upper right corner. For formative assessment, I will be walking around and looking over their shoulder to see what scores they are getting. |

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| **Learning Targets** | **Student Voice** |
| I will be able to identify and explain the process involved in solving linear equations and inequalities in one variable.  I will understand that I need to perform the same operation to both sides of the equation. | Students will be working with a partner and then as a class in the ‘oral practice’ activity. Students will have the opportunity to explain their thought process in why they think a certain operation should be performed. |

**Prior Content Knowledge and Pre-Assessment**

Students have worked with writing expressions from word statements. For example, students already know that adding 3 to *x* and then squaring the result is the same as (*x*+3)2. Students have also worked with finding *x* such that the expression equals a number. Students have also worked with inequalities before and know the symbols for them. However, students have not seen the equation form of these linear equations and inequalities. Students’ assessments have shown they are ready for the next step. This time, they are identifying, explaining, and solving linear equations and inequalities. Students are ninth graders in algebra.

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| **Academic Language Demands** | | |
| **Vocabulary & Symbols** | **Language Functions** | **Precision, Syntax & Discourse** |
| * Equations * Inequalities * Variables * Coefficients | * Students need to be able to know and use correct math terminology in order to understand the concepts presented in this lesson. * The assignment given to them asks for the least reading level. The instructions are clear and concise including the terminology introduced. | **Mathematical Precision:** Students will be asked to find the value of x in the linear equation and inequality. By the end of class they should have had enough practice and have an idea of the process.  **Syntax:** Students will be asked to describe the process they used to get to their answer.  **Discourse:** Students will reflect on their work by answering the question on the worksheet. |

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| **Language Target** | **Language Support** | **Assessment of Language Target** |
| Students will be able to justify their answers using the correct terminology. | I will restate their questions using the correct terminology so that they continuously hear and begin using the correct terms to describe their questions. | Students will be assessed based on the answers given to me when doing the ‘oral practice’ activity in class.  Students will also be assessed based on the question on their worksheet. I will read the terminology they used. |

**Lesson Rationale (Connection to previous instruction and Objective Standards)**

Students have worked with finding the value of x before; however, this time they will see it in an equation form. They will be given enough feedback on their misconceptions and led to the right path in order to do the homework and worksheet.

**Differentiation, Cultural Responsiveness and/or Accommodation for Individual Differences**

To accommodate for differences in mathematical ability the students will be receiving feedback from me. Students will work in pairs and I will be walking around listening to their discussions in the ‘oral practice’ activity from the book on page 29. There will also be a class oral practice. There is one student with special needs; thus, following the requirements in IEPs and 504 plans, this student will be given extra time to complete the activities. I will be checking up on the student to make sure he slowly but surely is keeping up. I will be aware of students’ body language and questions in order to achieve the highest level of understanding from them. Students will also have the opportunity to assess each other’s thinking since they will be doing the ‘oral practice’ activity in pairs.

**Materials – Instructional and Technological Needs (attach worksheets used)**

Materials: Computers need to be provided to the students; for example, in a computer lab to do the interactive practice activity. The worksheet is attached.

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| **Teaching & Instructional Activities** | | | |
| **Time** | **Teacher Activity** | **Student Activity** | **Purpose** |
| 15 min | There will be a short lesson on solving equations. I will ask students to pair up. Then, I will ask them to do the ‘oral practice’ activity in their book on page 29. I will also ask students to stop me and ask questions whenever needed. I will also be walking around listening to their discussions. | Students will get in pairs and discuss the ‘oral practice’ activity asking a problem to each other. | Students will work in pairs so that they can have a classmate’s perspective, too, and help each other if they are not sure what operation to perform. Walking around will help me assess how students are doing and clear any misconceptions. |
| 25 min | I will have a class discussion going over ‘oral practice’ in the book. I will have students work on <http://www.ixl.com/math/algebra-1> under J.3 and J.4, which is an interactive website that gives their score on the upper right corner as they are doing the problems. | Students will be involved in the class ‘oral practice’ activity. Then, they will go on to a computer to do the practice problems under the IXL website under J.3 and J.4. Extra time will be given to those students with special needs. Students will ask any questions for guidance. | Assess students through the ‘oral practice’ activity when working in pairs and as a class. I will find out if they are on the right track based on the score on the IXL website. The formative assessment will also be evaluating how well they solve the equations. |
| 10 min | I will be wrapping up the lesson. I will make sure students were able to solve the equations correctly. Students will get homework problems from the book on page 29 numbers 1-30 and a worksheet to explain their conceptual understanding. | Students will finish up working on the practice problems on IXL. Students will be given homework problems from the book and a worksheet. | Assess how students did, clear up their misunderstandings, and give them more problems to practice. |

There will be a benchmark assessment at the end of the unit.

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_

**Where is the mistake?**

Jocie solved the following inequality; however, she made a mistake. Find the mistake and explain what she needs to do to fix it.

-3x + 1 ≥ -5

-3x ≥ -5 – 1

-3x ≥ -6

x ≥ -6/-3

x ≥ 2