Introducing Multi-Step Equations: Week 4: Days 1-3

by *Grizel Macias and Rebecca Breeding*

* **Grade Levels:**  *8th grade*
* **Time Requirements:**
  + Approximately **5 hours** Preparation Time and **3 days** of Class Time
* **State Standards:**8.EE.C.7b.U3  
  8.EE.C.7b.U6  
  8.EE.C.7b.U7  
  8.EE.C.7b.U8  
  8.EE.C.7b.U9
* *Math/Science Objective*
  + Students will be able to learn how to solve multi-step equations including two -step equations.
  + Students will be able to understand and use key vocabulary by solving problems and explaining their work to other students.
  + Students will be able to use the Distributive Property when combining like terms and solving equations.
  + Students will be able to collaborate with classmates in solving problems.
  + Students will apply their understanding on how to solve equations to real world problems.
* **Brief Overview**:   
   This unit is designed as an introduction to solving multi-step equations. The first day , the students will learn which properties to apply and the step by step process to solve two-step equations. After taking notes and glueing to the given foldable, the students will be given proactive problems to reinforce their understanding of solving linear equations. The second day, the students will learn about the distributive property and how they apply it to solve the multi step equations. The students will also practice combining like term and simplifying both sides of the equations. The third day, the students will solve multi-step equations using the different methods cover during the past two days. They will provide justifications for every step they do in the process of solving the equations and check their solution.
* **Lesson Features:**
  + The students will watch **video clips** on how to solve multi- step equations found at Khanacademy.org: <https://www.khanacademy.org/math/algebra/one-variable-linear-equations/complicated_equations/v/multi-step-equations>
  + Teaching Strategy:   
    Case Method: Providing an opportunity for students to apply what they learn in the classroom to real-life experiences has proven to be an effective way of both disseminating and integrating knowledge.  
    Cooperative Learning: encourage small groups of student to work together for a common goal.
  + Critical Thinking: Critical thinking is a collection of mental activities that include the ability to clarify, reflect, connect and judge. It brings these activities together and enables the student to question what knowledge exists.
  + Interactive Features: The students can solve multi-step equations using algebraic tiles. The students can play online games with focus to solve multi-step equations: <http://www.math-play.com/> or <https://www.mangahigh.com/en-us/games/algebrameltdown>
  + Hands on/ Inquiry: Use the laptops to get into Geogebra to illustrate the different types of equations.
* **Materials Required For This Lesson:**

1. Vocabulary worksheet
2. Color paper
3. Math Journals/ notebook
4. paper

Copies of Practice Problems

Investigation Lesson: Week 4 Day 4

by  *Grizel Macias and Rebecca Breeding*

* **Grade Levels:** *8th grade*
* **Time Requirements:**
  + Approximately 1 **hour** Preparation Time and  **50 minutes**  Class Time
* **State Standards:****8.EE.C.7b**

**8.EE.C.7a: U3-11**

* *Math/Objective:   
  Students will be able to accurately solve word problems using strategies and properties of operations covered in previous lessons using the materials provided.*
* **Brief Overview:** In this investigation lesson, the students will solve word problems following the accurate process on their own. In this lesson, the students will write a multi-step equation from the provided word problem. The students will identify the variables and which process is the appropriate to solve it. The students will apply the properties of operations(i.e. distributive property, inverse property,...) to justify their steps. For the evaluation, the students will check their solution. If the solution is not correct, they can have the opportunity to look up what they did wrong by comparing their answers to members of the team.
* **Lesson Features:**[Critical Thinking](http://pedagogy.merlot.org/CriticalThinking.html) - Critical thinking is a collection of mental activities that include the ability to intuit, clarify, reflect, connect, infer, and judge. It brings these activities together and enables the student to question what knowledge exists.

Cooperative Learning: Cooperative and collaborative learning are instructional approaches in which students work together in small groups to accomplish a common learning goal. They need to be carefully planned and executed, but they don't require permanently formed groups. Later, the students will meet with their teams and discuss how can they represent their real world problem into a one step equation and look for the variable. They should write a half page report of how they would represent their one-step equation using what they researched.

* **Materials Required For This Lesson:**

Math Journal

Translating Words into Algebraic Expressions handout

Paper

Pencil