**Teacher:** Patsy Hester

**Date:** 6/21/2013

**Subject / grade level:** OCS Algebra 1/9-12

**Materials:** Computer/Projector, Laptop, Alice 2.2 or Alice 2.3 Guided Practice Handout

**NC SCOS Essential Standards and Clarifying Objectives**

Students will be able to use algebraic expressions in a variety of ways – evaluating, creating, matching expressions with stories

**Lesson objective(s):**

Students will be able to interpret and evaluate variable expressions

**Differentiation strategies to meet diverse learner needs:** Choice of activities to ensure students understand the concept of variables and how they relate to mathematics

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**ENGAGEMENT**

- Describe how the teacher will capture students’ interest.
  - Use the video created from the Alice Program – Alternately, add interactive elements to the program so students can select the appropriate expression to match a scenario and evaluate specific expressions given values for each variable.
  - What kind of questions should the students ask themselves after the engagement? Are there instances where using variables will be beneficial to me? Where might I encounter variables outside of math class/school?

**EXPLORATION**

- Describe what hands-on/minds-on activities students will be doing.
  - Video created using Alice Programming – show how the use of variables are related to specific events such as such as calculating total pay given the rate of pay and variable number of hours worked. Other examples could include how to calculate distance traveled and other examples that use a variety of order of operations. Depending on level of students, expressions with multiple variables can be discussed and evaluated.
  - List “big idea” conceptual questions the teacher will use to encourage and/or focus students’ exploration – Given the level of the student, it may be necessary to talk about “place holders” that are used in earlier grades. Ask what the students think the word variable means and why variables are even needed.

**EXPLANATION**

- Student explanations should precede introduction of terms or explanations by the teacher. What questions or techniques will the teacher use to help students connect their exploration to the concept under examination? Students should be familiar with formulas. Ask students what they already know. Have some formulas ready if they are needed. Compare tables of values to expressions that contain variable(s)
  - List higher order thinking questions which teachers will use to solicit student explanations and help them to justify their explanations. Have students look at patterns and come up with variable expressions that might create the pattern. Have students test their expressions for correctness

**ELABORATION**

- Describe how students will develop a more sophisticated understanding of the concept. Understanding variables work and how they are used in
algebra is a critical component of algebra.

- What vocabulary will be introduced and how will it connect to students' observations? Variable, patterns, expressions, evaluate (as opposed to solve)
- How is this knowledge applied in our daily lives?

**EVALUATION**

- How will students demonstrate that they have achieved the lesson objective?
  - Students will correctly select algebraic expressions that match a specific scenario
  - Students will correctly evaluate algebraic expressions using substitution and order of operations
  - Students will show they understand the difference between evaluate and solve
  - Students will write algebraic expressions from a given scenario – when asked the student will be able to identify the quantity that is represented by the variable.
- This should be embedded throughout the lesson as well as at the end of the lesson