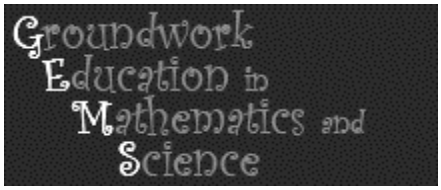

A Collaborative Project Between the University of Louisville and JCPS
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Lesson: *"Variables as Unknowns"*
Adapted from Teaching Student-Centered Mathematics, Grades 3-5, by John A. Van de Walle and LouAnn H. Lovin pp. 306-310

Content Vocabulary: *variable*

Concepts/ Skills/ Core Content:
Students will evaluate and write expressions with one variable.
Core content bullet(s) addressed:

5.2.1: Students will model verbal descriptions of real-world situations using a variable or missing value.
5.3.1: Students will represent real-world situations with simple number sentences with a variable or missing value and apply number sentences to real-world problems.

Materials:
Laptop and projector
Candy hearts
Game cards, dice
Score sheets
Pennies
HW sheet

Preparation:
Prepare and copy game cards, score sheets, and HW sheets.

Classroom/ Materials Management:
Students will be grouped in small groups of 2-3 students per group.
Designated students will assist the teacher and fellow.

Thinking Through the Lesson:

Lead class in the "number trick" as an attention-grabbing activity. (Activity 10.11, p. 308, Van de Walle and Lovin):

Write down any number.
Add it to the number that comes after it.
Add 9.
Divide by 2.
Subtract the number you began with.

Now "magically"predict that everyone ends with 5.

Divide the class into teams of two students each. Give each team one of these problems:

1) *Pick a number between 1 and 9, multiply by 5, add 3, multiply by 2, add another number between 1 and 9, subtract 6. Repeat with various numbers. What patterns do you see? Justify the pattern using a variable.*
2) *Pick a number, multiply by 6, add 12, divide by 2, subtract 6, divide by 3. Repeat with various numbers. What patterns do you see? Justify the pattern using a variable.*

Choose a team to explain the first problem to the class, then another team to explain the second. Be sure the team uses a variable; if not, ask for a suggestion from another team.

Lead class in a story problem using the candy hearts. (Candy hearts were used instead of the pencils suggested in the story problem because of the proximity to Valentine's Day.) (Activity 10.10, p. 307, Van de Walle and Lovin):
"There are 3 boxes of candy hearts and 5 extra candy hearts. There are 41 candy hearts in all." Students are to write an equation expressing these relationships.
Repeat for story problems involving all four operations.

Assessment:

Students write story problems and related equations in their notebooks.
HW sheet – Have students make up their own number trick, or analyze one you make up.

Literacy Connection:

Schwartz, David M. If You Hopped Like a Frog. Scholastic, 1999.

Reference: *John A. Van de Walle and LouAnn H. Lovin, Teaching Student-Centered Mathematics, Grades 3-5, Pearson Education, Boston, 2006. pp. 306-310.*