Equations

Summary

This activity will help students understand what an equation is and what it is not.

Materials

- *Safari Park*
  by Stuart J. Murphy
  Story price sheet
  Sticky notes
  Chart paper
- *Correct Equation*

Additional Resources

Books

- *Lesson for Algebraic Thinking*
  , by Maryann Wickett, Katharine Kharas, and Marilyn Burns; ISBN 0-941355-48-9
- *Math Matters: Understanding the Math You Teach Grades K-6*
  , by Suzanne H. Chapin and Art Johnson; ISBN 0-941355-26-8

Background for Teachers

In order to solve equations a student must understand that an equation includes an equal sign and two expressions (that may involve a math operation) of equal value. Teach your students to identify unknowns as missing information. It can be the same information, many different numbers, or just one value. A variable is a way to explain a value that students are not sure of.

Intended Learning Outcomes

1. Demonstrate a positive learning attitude toward mathematics.
2. Reason mathematically.
3. Make mathematical connections.

Instructional Procedures

Invitation to Learn

Explain to students that you need their help because your calculator is broken. Tell the students that you are trying to get the answer of 35, but the three and five keys are not working. Ask the students how they can get an answer of 35. You can limit it to sums if your students aren't comfortable with multiplication yet.

Instructional Procedures

Begin by reading the book *Safari Park*, and share the price list for the tickets so that students can follow the logic in the book. (It is recommended to read it once to introduce the book to the students and then use the organizer for the second read through. It might also be nice to allow students to talk about what rides they would go on). As book is read, stop and discuss the equations. Write them on the board and have students write the equations in their journal (this is a note taking strategy).

Review the vocabulary that was introduced from the Iguana activity. Help students identify the variable. Write the word on chart paper. Have the students work in pairs to give you an example of *variable* from the book. Leave this chart posted and refer to it through out the lesson.

By this point you should have been using the word *equation* often. Write it on the chart. Discuss what the definition of equation is. Have students give you essential characteristics (numbers,

operation symbol, and equal sign). Then have them create an example and synonyms (number sentence, math problem) to be added to the chart.

Remind students that they will be using these words through out the lesson and they need to know what they mean. Refer to the equations from the book and make sure they know how the words apply to them.

Point out one of the equations from the book (12 + 6 + 2 = 20) and write both forms on the board (one with the variable and one without). Then rewrite the equation, but replace one of the numbers with a number that would imbalance the equation (12 + 8 + 2 = 20).

Ask students to evaluate whether each number sentence is an equation, and does it match our definition or not. They should identify the last one as not an equation and the middle one as either, depending on the number the symbol represents.

Have students explain why each is or is not an equation. (You will talk about the variable later.)

Post more number sentences on the board. Have groups discuss whether they are equations and how they know (encourage students to think aloud).

Create a T-chart. Label the whole chart equations, the left side yes and the right side no. Give students two sticky notes. Have them write two number sentences. Allow students to work in partners if they can't think of anything. Then allow students to place their sticky notes in the chart under the correct column that they go in. You can review the equations by keeping the poster up and classifying a few equations and non-equations every day.

Pick one of the equations and write it on the board. Ask what would happen if they didn't know one of the numbers. Could the students still figure out what it is? Rewrite the problem, changing one of the numbers to a symbol. Ask the students to talk with their partners to explain how they would find the unknown number. Then call on a student to explain the process to the class.

Explain that this is an open equation because we don't know if it is correct until we substitute the variable for a number. Show students that it could be true or false, but point out that we are always looking for true equations in mathematics.

Tell the students that if that process really works, they should be able to solve the following equation (62 + = 85). Ask students to solve the equation and find out what box equals. Allow time to work and then have them describe to a neighbor what they were able to do. Call on students to describe what they did to solve the problem. Encourage students to explain their strategies.

Assign students to create their own list of open equations (tell them to keep it simple: only one operation, one variable and two or three numbers). Instruct students to also include the value of the variable.

Have students share their equations with a partner. Explain that the partner much check to make sure their equations and answers are correct by solving them.

Extensions

Curriculum Extensions/Adaptations/Integration

Research where numbers, equations, and variables came from. Have students write a small how-to paper for other students to use when they need help.

Input/Output patterns

Family Connections

Students teach the game to a family member.

Students create equations and then teach their family members how to solve.

Assessment Plan

Ask students to create a definition and example for the vocabulary words used that day to go in

their math journal as a tool.
Have students complete the *Correct Equations* sheet.
Give students a few problems everyday from the equations chart. Assign students to write in their journal if the equation is true or false and why.

Bibliography

Moyer, P.S. (2000). Communicating mathematically: Children's literature as natural connection. *The Reading Teacher*, Volume 54 (Issue 3), Page 246-255.
Monroe, E. E. & Panchyshyn, R. (1995-96). Vocabulary considerations for teaching mathematics. *Childhood Education*. Volume 72 (Issue 2), Page 80-83.
Monroe, E. E. & Orme, M. P. (2002). Developing mathematical vocabulary. *Preventing School Failure* , Volume 46 (Issue 3), Page 139-142.
Because vocabulary is an essential part of reading comprehension, we should incorporate it into our math comprehension. By using literature and vocabulary organizers we can help students incorporate abstract and unfamiliar math terms into useful daily language.
Students need to be exposed to the vocabulary through direct instruction and meaningful activities. Literature and group provide those opportunities.

Authors

Utah LessonPlans