

Equivalent Expressions

Summary

Using the scale the students will be able to visualize what is needed to make an expression equivalent.

Main Core Tie

Mathematics Grade 2

[Strand: OPERATIONS AND ALGEBRAIC THINKING \(2.OA\) Standard 2.OA.1](#)

Additional Core Ties

Mathematics Grade 2

[Strand: NUMBER AND OPERATIONS IN BASE TEN \(2.NBT\) Standard 2.NBT.4](#)

Materials

- *Equal Shmequal*
by Virginia Kroll; ISBN: 1-570-91892-9
Pencil
Balance scales
Centimeter cubes
- [Equivalent Expressions Answer Sheet](#) (pdf)
- [Equivalent Expressions Task Cards](#) (pdf)
- [Equal Schmequal BINGO card](#) (pdf)
Beans
- [Numerical Expressions](#) (pdf)
- [Word Expressions](#) (pdf)
Two pieces of white paper copy or computer paper
Scissors
- [The Animals pictures](#) (pdf)
Glue
Crayons
Beads
Pipe cleaner
Dice

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. Students need to understand the difference between an equation and an expression. Additionally, students need to understand the difference between the terms equal and equivalent. Students should have been introduced to the concept of missing numbers and balanced equations in previous lessons. By using manipulatives and having opportunities to practice, students develop a better understanding of these concepts. Before the lessons and activities are given students should be able to answer the following questions:

Vocabulary: expressions, equations, relationships, symbols

What is the difference between expressions and equations?

What symbols can be used in expressions or equations?

What do these symbols mean? $<$, $>$, $=$

How can numbers be compared using symbols?
What is an equivalent equation?
When would you use expressions or equations?

Intended Learning Outcomes

Solve equations involving equivalent expressions (e.g., $6 + 4 = + 7$).

Instructional Procedures

Invitation to Learn:

Read *Equal Schmequal* to the students.

Instructional Procedures:

Balance Scales:

Have students start by writing in their journals what equal and equivalent means.

Bring out a scale and centimeter (rainbow) cubes.

On the board, write simple equations like $15 = 7 + \underline{\hspace{2cm}}$.

Using the scale, put 15 blocks in one side, and 7 on the other. Have the students tell you how many more you need to put in to make the scale "equal schmequal." Make the problems progressively harder.

Following the group activity, split the class into groups. In these groups the students will use a scale to help them solve additional equations.

Once the students are in their groups hand out the *Equivalent Expressions Answer Sheet* to everyone.

Then provide each group with a set of *Equivalent Expressions Task Cards*, either set one or set two.

Make sure that on each student's *Equivalent Expressions Answer Sheet* they write which set of task cards they are working with.

Students will use the scale to help them answer the problems on the task cards.

Equivalent BINGO:

Tell students that they will now be playing an *Equal Schmequal BINGO Game*.

Hand out a *BINGO Card* to each student.

Provide students with beans or some sort of marker which they will use to cover each space.

Preferably this is something that the students can remove from their boards so they are able to play the game more than once.

Provide students with *Numerical Expressions*, which they will place anywhere on their BINGO card.

The teacher will then read *Word Expressions*, and the students will try to find the equivalent numerical expression on their BINGO card.

Booklet:

Instruct students on how to make a no staple booklet. To do this, each student will need two pieces of white copy paper or computer paper and a pair of scissors. Students will fold the first piece of paper in half. They will then unfold the paper and cut, on the line from each edge, about an inch in. Students will then set this piece of paper to the side. They will take the second piece of paper and fold it in half. This time the students will not open the paper back up. They will cut along the fold, starting about an inch from the top and stopping about an inch from the bottom. Students will then take the first piece of paper and put it through the hole of the second piece of paper.

Students will then be given a copy of *The Animals* that are in the book. They will cut out the animals and glue them in the book, starting with the mouse, rabbit, turtle, bobcat, wolf, deer, and finally the bear.

Students will then participate in writing algebraic expressions for each character.

Lesson and Activity Time Schedule:

Each lesson is 55 minutes.

Each activity is 30 minutes.

Total lesson and activity time is 90 minutes.

Extensions

The students could create their own expressions for a partner to solve. You could create some harder problems using multiplication.

2. Tug of War

This game can be played in pairs or small groups split in two teams.

Give each player ten beads.

Give each pair one pipe cleaner with the middle marked. The pipe cleaner symbolizes the tug of war rope. Match the middle marking with the zero on the number line.

Tell students that when the middle of the pipe cleaner is at zero, both sides are equal. If both sides are not equal, the rope has to be slid to the number that show how many more beads are on that side. The goal is to get the sides to be equal.

Player one rolls a die and puts that many beads on his/her side of the pipe cleaner. Then he/she slides the pipe cleaner that many spaces on the number line toward him/her.

Player two is trying to get an equal amount so they want to roll the same number.

Player two rolls the die and puts that number of beads on his/her side.

Player two slides the pipe cleaner that many spaces back toward him/her.

Before player one rolls again, ask him/her what number he/she needs to roll to make the teams equal.

Player one rolls again and the game continues.

If a player runs out of beads and he/she never makes both sides equal, then the teacher wins. If the players make the teams equal, which puts the pipe cleaner at zero, the students win.

Example: Player one rolls a three and places three beads on his/her side of the pipe cleaners. Player two rolls a four. He/she puts four beads on their side of the pipe cleaner. They are not equal, so player one rolls again. Before player one rolls, ask what number he/she needs to roll to make the teams equal. The game continue until the players run out of beads or the pipe cleaner is on zero. If the players can make the sides equal before running out of beads, they beat the teacher.

Family Connections:

Have students play the BINGO game at home with family.

Have students create their own expressions at home and solve them with their families.

Students and parents can make up their own activity with equivalent equations at home.

Students can bring back any other activities they made up with their families to share with the class.

Assessment Plan

By using informal assessment, you can determine what your students know or don't know through these activities.

Since these are practice activities students should already have been taught these concepts, if they are struggling with these activities you can determine what you as a teacher can do to help them understand.

Students can hand in black lines of the activities to you can assess what they are missing.

Have students write in their journal after each activity to assess themselves in these activities.

You can look over their journals.

Students could be asked to respond to questions in their journal that would give evidence of understanding.

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