Being Equal is No Monkey Business

Summary

Students will complete a variety of activities to help determine whether or not an equation is equal or not equal.

Main Core Tie

Mathematics Grade 1

Strand: OPERATIONS AND ALGEBRAIC THINKING (1.OA) Standard 1.OA.7

Additional Core Ties

Mathematics Grade 1

Strand: OPERATIONS AND ALGEBRAIC THINKING (1.OA) Standard 1.OA.1

Materials

Banana Runts
Monkey Math Balance scale
- Equal and Not Equal cards (pdf)

Addition sentences
- Tree one and tree two cards (pdf)

Additional Resources
Books
- *Five Little Monkeys Jumping on the Bed*
, by Eileen Christelow; ISBN 1-590-99459-x
- *Dinosaur Deals*
, by Stuart Murphy; ISBN 978-0064462518

Background for Teachers

Students need to understand that an equation is a relationship between numbers where both sides of the equation are equal, or the same. The mathematical symbol for that relationship is represented by the equal (=) sign. Students also need to understand that it is possible that a number sentence could not be equal on both sides. Students need opportunities to see both equations that are true and not true and develop thinking strategies to help them determine whether or not an equation is equal or not equal.

Intended Learning Outcomes

5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

Instructional Procedures

Invitation to Learn
Split the class into pairs and give each pair an odd number of the banana Runts. Pairs work together to find a way to split the bananas so each will get the same amount. Since an odd number can't be evenly split, they need to think of possible solutions both can agree on.
Instructional Procedures

Bring the class to the front of the room.
Pick a boy and girl to come to the front of the room. They will be the king and queen of the

jungle. Place a crown on each of their heads.
Explain to the students that there are rules in the jungle and the king and queen will help us figure out one of the rules. They won't tell us the rule but they will show us things that follow the rule. They will also show us things that don't follow the rule.
The king will put things that follow the rule on tree one. The queen will put things that do not follow the rule on tree two.
Place, or draw, tree one and tree two on the board.
Have simple equation cards written on papers for the king and queen to hang up. Possible equations for tree one are any equations that are true i.e. 1 + 1 =, 3 = 3, 2 + 1 = 3, 4 + 5 = 9. Possible equations for tree two are any equations that are not true i.e. 1 = 5, 2 + 2 = 1, 2 + 3 = 4.
Begin by handing the king a true equation to put on tree one.
Tell the students that they are not going to try to guess the rule right away. First they need to think. Ask them to think about what they notice about the paper the king is putting on tree one.
Give a false equation to the queen. Ask students to think about what they notice.

Repeat the process by giving the king and queen another equation, each time focusing the students on what they notice.

After three papers are hanging on each tree, ask the students if they know the rule. Instruct them to get with a partner and discuss what they think the rule is.

After a minute, invite students to prove they know the rule by stating an equation that follows the rule and could be written on tree one.

If the student gives a true equation, add it to tree one. Have the student give a false equation for tree two.

Let a few more students prove they know the rule.

Have students define the rule. A possible definition might be that in the jungle the king and queen only allow equations that are equal. They don't allow equations

Explain that when an equal sign is used that means that both sides of the equal sign have the same amount. If both sides have the same amount they are equal. If both sides don't have the same amount they are not equal.

Bring out Monkey Math. Put up the "Equal" and "Not Equal" category cards.

Put the number six banana token on one of the monkey's arms and have the students notice what happens to the eyes and arms when one arm has some bananas and another arm doesn't.

Put a number four banana token on the other arm.

Write the math equation 6 = 4. Ask the students if the king would allow this math equation in the jungle?

Have a student write the equation 6 = 4 under the "Not Equal" category.

Take banana tokens off and try a new equation. Place the number four banana token on one side and then ask the students what should be placed on the other side to follow the king's rule.

Try students' suggestions and determine if an equation could be written under the "Equal" category card. Then ask if there is another way to make an equation that would follow the rule.

For example: One student recommends the number four token. Put the number 4 token up and write 4 = 4. Have students observe how the monkey looks when the rule is being followed. Ask if something could be used besides four. Lead them to discover two 2s would also fit the rule as well as a 3 and a 1. Write each math sentence under the "Equal" category card.

Tell each group go to their seats with a Monkey Math worksheet, two category cards labeled "Equal" and "Not Equal", and a pile of equations to test.

Two students need to line up the banana tokens in order from least to greatest, set up the category cards, and test each equation (one at a time).
The group decides whether the equation fits the rule of the jungle and goes in the "Equal" category or does not follow the rule and goes in the "Not Equal" category.
Students write the sorted equations in their math journal.

Extensions

Take the banana tokens and have students put them in order from least to greatest, face down, so they can't see the numbers.
Teach, and as a class perform, *The Banana Split*. The banana split is a skit that is set to the theme song of *2001- A Space Odyssey.* You start with your back to the audience and a banana tucked into your right armpit with your left hand so no one can see it. As the music starts you stand with your head down until you hear the music build in 3 horn blows. For each of the three blows you do a three-step 180-degree turn. Right foot steps out to the right on blow one. Left foot does a 180° turn on blow two. Right foot steps out on count three. On the next count the left hand raises to the left diagonal and left foot steps out to present the banana. Hold for the rest of the count of eight. When the drums start the right arm bends like you are tickling your armpit like a monkey while you hop from foot to foot. This completes the monkey look. When the music changes to the slow three beats bring the banana in front of you and peel it. On the fourth beat raise the peeled banana to the left diagonal again. When the drums start hop like a monkey again. The next three beats you start with the banana raised to the left diagonal and in three counts dramatically bring the banana to the front.
This time when the music crescendos, stick the banana in your mouth and eat as much of the banana as you can. Keep eating until the big cymbal crash near the end of the music. At that point raise the banana peel back up to the left diagonal. Wave the peel until the big finish. At the last beat of the music throw the banana peel to the ground or in a garbage.
Take the equations from the activity that were not equal and find a way to make them equal. The rule is that you can't change any numbers that are already there, but you can add numbers.
Give each team four stacks of cards numbered 1 -- 10. Have a student draw four cards to see if they can make an equation that fits the rule.
Make equation cards of both addition and subtraction facts. Make cards with different equations that have the same answer and have kids create their own categorization for the cards.
-- For example: you may have 4+1=5, 3+2 =5, 5+0 =5, 10-5 =5, 9-4=5, 13-8=5, for the number five. Students could make any categories such as: has a zero, addition, subtraction, equals a certain number, has a number larger than ten, all numbers are less than ten, has one even number, has one odd number, has two even numbers, etc. Do the same for other numbers.
-- You can also include some equations that are false.
Sing, or read, *Five Little Monkeys Jumping on the Bed*. Ask the students if they ever wondered what happened to the monkeys that fell off the bed. Where are the monkeys with the broken heads? Write a story about where the monkeys with broken heads go and what happens to them. Did they ever jump on the bed again or did they learn their lesson.
-- Write all the addition sentences that show monkeys jumping on the bed plus monkeys with broken heads equaling five monkeys.

Family Connections

Find places in the house where things are balanced.

For example: One candlestick on each side of the table, three chairs on one side of the table and three on the other side, etc. Send home a disposable camera. Have each student take a picture of one thing that shows equal and one thing that shows not equal. Make an Equal, Not Equal class book that can later be sent home to read with the family.

Assessment Plan

Give students an equation. First have them decide whether the equation is equal or not equal and then explain why.

Give students an equation that is not equal and have them fix it so that it is equal. In order to do this they cannot change any numbers but they may add any amount to either side of the equation.

Bibliography

Research Basis

Marzano, R.J., Pickering, D.J., & Pollock, J.E. (2001). *Classroom Instruction that Works*. Research and Theory Related on Identifying Similarities and Differences, pg. 14-17. Alexandria, VA. McRel

Researchers have found identifying similarities and differences to be mental operations that are basic to human thought. There is strong research base supporting the effectiveness of having students identify similarities and differences with and without direct input from the teacher. Both student-directed and teacher-directed activities have their place in the classroom.

Association of State Supervisors of Mathematics & Eisenhower Network, (2002). *Edthoughts: What We Know About Mathematics and Learning*, pg. 73-99.Aurora, CO. McRel

This section of the book discussed how teachers can improve student learning by teaching metacognitive strategies which include: connecting newly learned information with that already known; carefully choosing appropriate thinking strategies; and planning, monitoring and judging the effectiveness of the thinking processes.

Authors

Utah LessonPlans