

Center Time

Summary

By using manipulatives and having opportunities to practice students will develop a better understanding of the concept of missing numbers and balanced equations.

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.3](#)

Materials

- *Equal Shmequal*

Dice

Pipe Cleaner

- [Tug of War Number Line](#) (pdf)

Large plastic beads

Monkeys on a Vine

16 dominoes per pair

- [Monkey Vine](#) (pdf)

- [Monkeys](#) (pdf)

Hit and Miss

1 die

- [Number cards 0 - 12](#) (pdf)

Peek-a-Boo Pennies

- [Piggy Bank](#) (pdf)

Number cards 6-12

12 pennies per pair

Paper cup

- [Peek-A-Boo Record Sheet](#) (pdf)

Genie Boot Camp

Dry erase board

Marker

Eraser

- [Genie Lamp Number Cards 1-12](#) (pdf)

12 Unifix cubes

Pattern blocks

Wishes

Going bananas

Monkey Math balances

Banana Tokens

- [Going Bananas](#) (pdf)

Tic-Tac-Toe Where Did the Dots Go?

- [Missing Dots](#) (pdf)

- [Five "X's"](#) (pdf)
- [Five "O's"](#) (pdf)
- [Tic-Tac-Toe game board](#) (pdf)

Paper fasteners
2 x 2.5 inch papers

Additional Resources

Books

- *Equal Shmequal*
, by Virginia Kroll; ISBN 13-978-1-57091-892-6

Background for Teachers

These activities are to be taught to the whole class or with small groups and then practiced independently in centers, stations, or workshop time. 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.

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

Begin by reading the book *Equal Shmequal*. Talk about the different kinds of equal that the book illustrates. Make a connection from the teeter-totter to the Monkey Math balance scale. Explain that in a game of tug of war the teams need to be equal.

Instructional Procedures

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 and a *Tug of War Number Line*. 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 their side of the pipe cleaner. Then they slide the pipe cleaner that many spaces on the number line toward them.

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 their side.

Player two slides the pipe cleaner that many spaces back toward them.

Before player one rolls again, ask them what number they need to roll to make the teams equal.

Player one rolls again and the game continues.

If a player runs out of beads and they never make 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 their side of the pipe cleaner. They also slide the pipe cleaner three spaces on the number line so the middle marking is now on the number three. Player two rolls a four. They put four beads on their side of the pipe cleaner and pull the pipe cleaner four spaces back toward them which puts the middle mark on the number one on player two's side. They are not equal so player one rolls again.

Before player one rolls, ask what number they need to roll to make the teams equal. The game continues 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.

Monkeys on a Vine

Place 16 dominoes, eight matching, in the center of the work area face down. A matching domino is a domino with the same total number of dots in a different configuration.

Players take turns picking two dominoes at a time to see if they can find two dominoes that match.

If a player picks a domino match, one domino is placed on each side of the monkey vine to represent leaves on the vine. Draw the domino and write the equation underneath, (start at the bottom of the vine).

Put the matching dominoes in a discard pile.

Move the monkey so it is hanging by the equation. Move the monkey up the vine each time a domino equation is filled in.

The game ends when the dominos are all gone or one player has domino equations to the top of the vine. The player with the highest monkey on the vine wins.

Hit and Miss

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

Give each player a stack of numeral cards 0 -- 12.

Before a player takes a turn they say any number they want from 1 -- 12. Students need to write their number down so they don't forget.

The first player rolls the die to see what number to start on.

The first player starts with the number rolled and counts up till they get to the number stated.

When the first player figures out the amount needed, they find that number card and put it in a discard pile.

If the player doesn't have the card needed, their turn is over, they don't get to discard any cards, and it is now the next player's turn.

Example. A student states the number 10. They roll the die and get a two. From two, they need to count up to figure how many more are needed to get to 10. If they have the number eight card, they would get rid of that card by putting it in a discard pile. If they don't have the number eight card, their turn is over and they don't get to discard any cards.

The game is over when a player gets rid of all of their cards. If time runs out the winner is the person who has the least amount of cards left.

Students may use counters to help them figure out the missing number.

This activity could also be pushed to the symbolic level by requiring students to write the equation. Start with the number they state being equal to the number they roll plus the missing number, e.g., $10 = 2 + 8$.

Peek-a-Boo Pennies

Pair up students and provide each pair with a piggy bank, 12 pennies, a paper cup, and a *Peek-A-Boo record sheet*.

One student draws a number card. This is the number of pennies we will have in our piggy bank for 1 -- 5 turns.

Partner one gets the amount of pennies equal to the number on the card and puts them in the piggy bank.

Partner two closes their eyes.

Partner one takes the paper cup and covers any amount of the pennies.

When partner one has the desired pennies covered they say, "Peek-A-Boo" which signals partner two to open his/her eyes.

Partner two counts the number of pennies showing and records that number on the *Peek-A-Boo*

activity sheet.

Then partner two determines how many pennies are hiding under the cup and writes the number in the square.

Partner two finishes the sentence and asks partner one to check their answer.

If partner two was correct then partners switch places and the game continues. If partner two was wrong, they have to close their eyes while partner one hides a different number of pennies.

An extension to this activity is to use all nickels or all dimes instead of pennies. This would reinforce the concept of counting by fives or tens.

Genie Boot Camp

This activity can be played in small groups or with the whole class.

Each student needs a white board, marker, and eraser.

One student draws a *Genie Lamp Number Card*, to be used as the total amount wished for.

The teacher shows a stack of Unifix cubes, any amount less than or equal to the amount on the card, and says, "I wish I had _____(the number on the card)."

Students count the number of cubes that the teacher has and writes that on their board.

Next they write a plus sign and put a pattern block down to represent the missing number.

Students finish the sentence by writing an equal sign and the number on the card.

For example: If 9 is the number card picked, the teacher might show 6 Unifix cubes. Students write $6 + \underline{\quad} = 9$

Students start with the number of Unifix cubes and count up to the total.

When they decide the answer, they pick up a pattern block, secretly write the missing number, and put the pattern block on top of their answer.

Students keep answers hidden until the teacher says, "Show me how to get my wish."

Students then remove the symbol to reveal the missing number.

Students who have the right answer get a "wish" (wishes can be any object. Counters, pompoms, small treats, etc). The first student to get three wishes wins the game.

A new game is started by a student drawing a new card to get a different total to wish for.

Going bananas

Split group into pairs

Give each pair a *Monkey Math balance* and a *Going Bananas worksheet*.

Instruct each pair to put a certain banana token (greater than five) on one side of the scale.

Tell them they have sixty seconds to come up with as many ways to balance the scale as possible.

Students need to record their equations when they come up with a balance.

The team that comes up with the most equations in sixty seconds wins that round.

Begin a new round by changing the single banana token.

For example: Tell the students to put the number nine banana tokens on the right side of the scale. Start the timer and students can pick tokens to try to balance the scale. If the scale balances, they need to write the equation that matches. $3+6=9$, $4+5=9$, $8+1=9$, $7+2=9$.

Tic-Tac-Toe Where Did the Dots Go?

Copy and cut the *Missing Dots* papers into rows.

Cut 2 x 2.5 inch papers that can be connected with a paper fastener to create a flap over one of the sections. This creates a missing part.

Divide group into two teams.

Teams determine who are "X's", who are "O's" and who goes first.

Teacher picks one student from each team to race.

Teacher shows a *Missing Dots strip* so both players can see.

The first player to say the missing part gets to place their game piece on the tic-tac-toe board.

Two new players are selected and the game continues.

The first team to get three in a row wins. If no one gets three in a row then the teams tie.

Clear the board and begin a new round.

Extensions

For the game *Hit and Miss*, you can pick a number between 5 and 11 and have students find the combinations of the two cards that total that number. With the two cards students make a sandwich with the numbers facing out. The challenge is to name the number on the other side of the sandwich when given the total of both sides.

All math sentences may be recorded in a math journal rather than the activity sheets.

Family Connections

Send home Tug of War pipe cleaners, beads, and a die for the family to play together at home. Students make their own missing dots cards to take home and play Tic-Tack-Toe with their family.

Send home a *piggy bank* and paper cup. Students need to find their own pennies at home and play Peek-A-Boo pennies with someone in their family.

Assessment Plan

Observing students throughout the activities is an effective informal formative assessment for teachers.

Some of the activities also have worksheets that students complete while working on the activity. These worksheets are an excellent source of assessment.

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

-- If I had two piles of bananas with three bananas in one pile and four in the other, that would be seven bananas altogether. What is another way I could have seven bananas in two piles?

-- I know I have eight toy cars but I can only find three. How many are hiding in my room somewhere?

Bibliography

Research Basis

Marzano, R.J., Pickering, D.J., & Pollock, J.E. (2001). *Classroom Instruction that Works*. Research and Theory Related to Practice, pg. 66-71. Alexandria, VA. McRel.

This section of the book states the importance of practice and how it is necessary for gaining knowledge of any type. The two generalizations from the research on practice are: that mastering a skill requires a fair amount of focused practice, and while practicing, students should adapt and shape what they have learned using manipulatives and hands on activities.

National Association for the Education of Young Children. (1987). *Developmentally Appropriate Practice in Early Childhood Programs Serving Children From Birth Through Age 8*. Washington, DC: NAEYC.

Most six-year-olds and many seven-and eight-year-olds may be more mature mentally than physically. Therefore, hands-on activity and experimentation is more appropriate for this group than fatiguing mechanical seatwork.

Authors

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