Circle the Wagons a Number is Missing

Summary

Students have an opportunity to work in pairs as they search for the missing addend that will complete a mathematical sentence. Students will demonstrate the ability to change the order of the addends and still produce the same sum.

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.1

Mathematics Grade 2

Strand: NUMBER AND OPERATIONS IN BASE TEN (2.NBT) Standard 2.NBT.5

Materials

- Missing Addend Sentence Cards pdf
- Numeral Cards pdf

Dice

- Missing Addend -- Dice pdf

Math Journal

Pencils

Additional Resources

Books

- *Mission Addition*
  , by Loreen Leedy; ISBN 0823414124
- *Quack and Count*
  , by Keith Baker; ISBN 0152050256
- *M&M's Counting Book*
  , by Barbara Barbieri McGrath; ISBN 0-88106-853-5

Background for Teachers

This activity is designed to give the students an opportunity to work in pairs as they search for the missing addend that will complete a mathematical sentence. Students will demonstrate the ability to change the order of the addends and still produce the same sum. To insure a smooth transition into the activity, modeling of what the activity is suppose to look like will have had to be previously taught and practiced.

Intended Learning Outcomes

1. Demonstrate a positive learning attitude.
2. Understand and use basic concepts and skills.

Instructional Procedures

Invitation to Learn

Pass out a card with an addend on it to each student. The cards should be numbered 0-10. Instruct

the students that their assignment is to find someone who has an addend that when added to their addend will produce the sum of ten. Once they have found the addend to complete the assignment have them stand next to each other and hold up their cards. You will collect the cards and make a quick assessment to see if each pair is correct.

If you have an odd number of students in your class, then one student will be left without a partner. One way to deal with this is let that student be responsible for checking if the pairs are correct. Another way could be to ask the class to figure out a way to incorporate this student into the groups. Maybe they will opt to shuffle the pairs and form one group of 3 to include the student.

Now that each student has a partner we will play a game. Each pair will face each other and put one hand behind their back. On the teachers mark each student will show the hand they have been hiding showing a number of fingers (1-5). The student who can correctly give the sum of the two hands quicker wins that round. The students who did not win will take their seats and the remaining students will pair up with the student closest to them and play the game again. The game is played until one student remains. Discuss with the students why for some of them it was easier than it was for others. An alternative to this game could be to have the non-winners partner up and continue playing the game. That way all the non-winners have a chance to experience being winners and vice versa. You can have the class play a couple of rounds of this. This alternative method has the advantage of leaving the class divided into two equal groups which is what we need for the following activity.

Instructional Procedures

Students will be separated into two equal groups. Have one group form a circle, each student should face outward. This will be the inside circle. Have the second group of students form a circle around the first circle. Each student should face inward and line themselves up with a student from the inside circle. If there is an odd amount of students have two students from the outside circle pair up.

Each student from the outside circle should be given a card from the *Missing Addend Sentence Cards*. Adapt the cards to fit your students' needs. If your students are ready for it, you might want to give them a sum larger than 12.

Each student from the inside circle should receive a card from the *Numeral Cards*. Adapt the cards to fit your students' needs.

Tell the students facing each other to check and see if the numeral the student is holding in the inner circle will make the math sentence held by the outer circle student true. If the sentence is true have the pair exit the circle, collect their math journals, and return to one of their tables as a pair. Together the pair should record their math sentence in their math journal and then create and record a math family from the original sentence.

After all of the students whose sentences are true have left the circle have the remaining students in the outer circle rotate to the right and go through the process found in step 4. Continue this until all the students have found the math sentence or the numeral that makes their sentence true.

All students should now be seated with their partners at a table. Hand out two dice and the worksheet *Missing Addend -- Dice* to each pair.

Explain to the students that the sum they have been working with for their math family is going to be the sum for all of the missing addend problems they will be creating. To complete the worksheet they will first fill in the blank for the sum, and then they will roll the dice and record the number of dots for each dice in the space that looks like dice. The sum of the dice will be recorded on the line above the picture of the two dice. The students will then solve the addition sentence for the missing addend. The missing addend will be recorded on the worksheet in the missing addend symbol.

For closure to the lesson have a few of the pairs share with the class how they went about solving the worksheet.

Extensions

The number of dice can be increased or decreased.
Instead of using dice you could use dominoes.
This activity can be adapted to make a station for a math center.

Family Connections

Have the students teach their families the different activities used in class.
Have family members use household items to create real life situations with missing addends.

Assessment Plan

Observe how the students work together -- does one student dominate the activity?
Have the students share with you what they are recording in their math journal.
Use the *Missing Addend --Dice worksheet*.
Have the students verbally explain their thinking process.

Bibliography

Research Basis

Walters, L. S., (2000). Putting Cooperative Learning to the Test. *Harvard Education Letter*. May/June 2000. (1-6).

Cooperative learning in the classroom has a strong research base. Teachers are moving away from the traditional teaching methods, rearranging their students into groups where they are encouraged to talk and share ideas as they shift to accommodate more teamwork within the classroom. Two essential components need to exist for cooperative learning to lead to significant gains in achievement. The first key component promotes interdependence with groups -- fostering the perception that students must work together to accomplish the goal. The second key component is to hold students individually accountable for demonstrating their understanding of the material. Students cannot "hitchhike" within the group.

Lacampagne, Carole, B. (1993). *State of the Art: Transforming Ideas for Teaching and Learning Mathematics*. Office of Educational Research and Improvement, July 1993. (1-14)

This research covers some fundamental shifts for the teaching and learning of mathematics. For teachers, administrators, and parents, it presents ten ideas for transforming mathematical teaching. A major focus is that all students can and must learn mathematics. Mathematics is not linear and hierarchical with teaching rote skills first, followed by problem solving later; but builds on that students learn best when they are intellectually challenged so that they are motivated to fill in mathematical gaps when necessary. Teachers need to provide stimulating problems and an environment to motivate mathematical learning.

Authors

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