Dominos At Play

Summary

This dominos activity will help students investigate, analyze, invent, critique, develop number sense, and deepen their mathematical thinking.

Materials

Set of double nine dominos
Overhead of double nine dominoes
- *Double Nine Dominos*
- Blank dominos

Scissors
Bag or envelope to keep dominos in
- *Dominoes at Play*

Manipulatives

Background for Teachers

This activity will help students investigate, analyze, invent, critique, develop number sense, and deepen their mathematical thinking. Using visual and conceptual models can help reveal mathematical ideas. Problems that can be solved in a variety of ways should be provided. Allow students time to share, explain, and compare their work.

Refer to the Mathematics Glossary in the Core Curriculum for definitions of the following terms.

Addend	Algorithm
Array	Associative Property
Commutative Property	Dividend
Divisor	Expanded form
Exponent	Expression
Factors	Identity Property of Addition
Identity Property of Multiplication	Numeral
Product	Quotient
Remainder	Rules of Divisibility
Sum	whole number
Zero Property of Multiplication	

Intended Learning Outcomes

1. Demonstrate a positive learning attitude toward mathematics and represent mathematical situations.

Instructional Procedures

Invitation to Learn

Have dominos set up on end, when you are ready to start the lesson, start a chain reaction. Math is a process of chain reactions and basic numeration. Start adding and building onto the concepts and facts. [Commutative property (a x b = b x a)]

Distributive property (6 x 7 = 6 x (3 + 4) = (6 x 3) + (6 x 4) = 18 + 24 = 42)

Instructional Procedures

Dominos At Play

Have each child select a domino from a face down pile.
Using their worksheet, figure out the product of their domino, according to the two factors (numbers).
Solve the problem using the commutative property and at least one other way. Provide a variety

of manipulatives for them to use.
Within their group have them compare the numbers. Are any equal? Whose is greater? Less?
In groups, they are to line up their dominos from biggest to smallest, according to the product of the two factors (numbers) on the domino, Then they are to record what they see.
What do you notice about the factors and the products? Describe the patterns you see.
Write a story problem using your factors.
Gather together the dominos. Once again mix them up and have students pick one domino from the pile (higher students should pick two).
Have all students stand. If the product of your domino is greater than 25, sit down. If it is greater than 10 sit down. Repeat until you have the student with the lowest product.
Have the student that is left standing read their story problem aloud.
The person that has the answer will stand and tell the number sentence. They will then read aloud the story problem they wrote. Repeat until all students have had a turn.

Extensions

Curriculum Extensions/Adaptations/Integration

Extension for advanced learners -- Use two dominos and find the product of a three digit number times a one-digit number.
Adaptations for learners with special needs -- use only one domino and multiply those two numbers together.
Dominos can also be used for place value, addition/subtraction, division and fractions, perimeter, and area.
Start with a number line long enough to handle the times tables you're learning. Take a domino and place it over the answer on the number line; practice until you can do it quickly. Make sure you've got the right answer by checking a times tables chart. Say the times table and the answer. See if you notice any patterns as you do this. Take away the number line and do the same thing. You might want to do them in order first (A Hundreds chart could also be used).
Language arts -- research the history of dominoes. Learn some of the vocabulary related to dominoes: bones, cards, tiles, ranks, suits, singles, doubles, layout, chain, line, weight, heavy, light, sniff, spinner, open ends, block, draw, crosswise, sprouted, block, draw, boneyard, forfeit, posed, muggins, abutted, etc.
Social Studies/Measurement--Asia: create a representation of the Great Wall of China, one domino equals how many miles?

Family Connections

Learning at home -- Domino Games: Domino War, Good Times, Climb the Ladder, Windows
Create a game as a family using dominoes.

Assessment Plan

Check the *Dominoes at Play* worksheet for understanding
Observe students as they participate in the activity.

Bibliography

Burns, Marilyn, (1999) ARITHMETIC The three-legged stool. *The Newsletter for Math Solution Participants* -- Number 25 (Online version) Spring/Summer 1999, retrieved January 7, 2006 from http://www.mathsolutions.com/mb/print/newsletter/spring_99_nl_l_p.html
Memorization should follow, not lead instruction that build's children's understanding. The emphasis of learning concepts and relationships in mathematics must always be on thinking, reasoning, and making sense.
Foy, P., Martin, M.O., Mullis, Ina V. S. (2005). IEA's TIMSS 2003 international report on achievement

in the mathematics cognitive domains - *Findings from a Developmental Project*, TIMSS & PIRLS International Study Center, Chestnut Hill, MA, (pg 65), retrieved January 7, 2006, from http://timss.bc.edu/PDF/t03_download/T03MCOGDRPT.pdf ISBN: 1-889938-38-6
Students need to be familiar with the mathematics content being assessed, but they also need to draw on a range of cognitive skills. The first domain--knowing facts, procedures, and concepts--covers what the student needs to know, while the second--applying knowledge and conceptual understanding--focuses on the ability of the student to apply what he or she knows to solve problems or answer questions. The third domain--reasoning--goes beyond the solution of routine problems to encompass unfamiliar situations, complex contexts, and multi-step problems.
Ma, L. (1999). *Knowing and teaching elementary mathematics*. Mahwah, NJ: Erlbaum. Pg 35, 112
Developing fluency requires a balance and connection between conceptual understanding and computational proficiency. On the one hand, computational methods that are over-practiced without understanding are often forgotten or remembered incorrectly. On the other hand, understanding without fluency can inhibit the problem-solving process.
Being able to calculate in multiple ways means that one has transcended the formality of the algorithm and reached the essence of the numerical operations--the underlying mathematical ideas and principles. The reason that one problem can be solved in multiple ways is that mathematics does not consist of isolated rules, but connected ideas. Therefore being able to and tending to solve a problem in more than one way, therefore, reveals the ability and the predilection to make connections between and among mathematical areas and topics.

Authors

Utah LessonPlans