Gulping Down Subtraction

Summary

Activities help students begin the transition to subtraction.

Main Core Tie

Mathematics Kindergarten
Strand: OPERATIONS AND ALGEBRAIC THINKING (K.OA) Standard K.OA.5

Additional Core Ties

Mathematics Kindergarten
Strand: OPERATIONS AND ALGEBRAIC THINKING (K.OA) Standard K.OA.1
Mathematics Kindergarten
Strand: OPERATIONS AND ALGEBRAIC THINKING (K.OA) Standard K.OA.2
Mathematics Kindergarten
Strand: OPERATIONS AND ALGEBRAIC THINKING (K.OA) Standard K.OA.3

Group Size

Large Groups

Materials

Ten Sly Piranhas
- *Ten Sly Piranhas Cutouts*
- *Ten Sly Piranhas*
  Goldfish crackers

Ten Frame Subtraction
- *Ten Frame*
  Fish counters
- Number cards
  Small container
- *Ten Frame Recording*
  Pencil

Subtraction Toss
- *Fish Number Line*
  Fish Counters
  Number cube
- *Fish Number Line Recording*
  Pencil

Graphing Subtraction
- *Fish graph*
  Fish counters
- *Fish Graph Recording*
  Paper sack

Fish Subtraction Stories
- *Fish Story Boards*
  Fish counters
  Response boards

Markers/chalk

Fishy Journal Entries

- Fish journal stories

Markers/pencils

Additional Resources

Books

Ten Sly Piranhas: A Counting Tale in Reverse (A Tale of Wickedness--and Worse), by William Wise; ISBN 0-8037-1200-6.

Ten Little Fish, by Audrey Wood; ISBN 10:043963561

Splash, by Ann Jonas; ISBN -- 10: 0-688-15284-8

Five Little Penguins Slipping on the Ice, by Steve Metzger; ISBN 0-439-46577X

Monster Math, by Anne Miranda; ISBN 0-439-20859

Elevator Magic, by Stuart J. Murphy; ISBN 0-06-446709-0

Seven Little Rabbits, by John Becker; ISBN 10:0802796346

Ten Wriggly Wiggly Caterpillars, by Debbie Tarbett; ISBN: 10:184506027X

Developing Number Concepts Addition and Subtraction, by Kathy Richardson; ISBN 0-7690- 0059-2

Articles

Developing Math Games Based on Children's Literature, by Kay M. Cutler, Deanna Gilkerson, Sue Parrott, and Mary Teresa Bowne; NAEYC www.naeyc.org 2003

Selected Book Pairs for Linking Math and Literacy, by Phyllis Whitin and David J. Whitin; Beyond the Journal, Young Children on the Web, March 2005

Learning Math through Stories, by Stuart J. Murphy; School Library Journal, March 1999 ISSN 0362-8930

Promoting Mathematical Explorations Through Children's Literature, by David J. Whitin and Cassandra C. Gary; Arithmetic teacher, March 1994 ISSN 0004-136X

The "Wow" Factor, by Lisa Von Drasek; www.TeachingK-8.com January 2006

Using Children's Books to Teach Math, by Marilyn Burns; www.didax.com February 2005

Organizations

National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 20191- 1502 (703) 620-9840, www.nctm.org

Background for Teachers

Children learn mathematics through everyday experiences and language. When they tell stories about their own math problems, they make connections to their own life experiences and other knowledge.

Likewise, using literature to help students make connections between the real world and mathematics is a valuable tool for teachers. Literature can foster the growth of mathematical thinking through the problems presented in the stories. Problem solving strategies can be developed through mathematical discussion of literature. Talking about math through literature can help struggling students learn to communicate in the language of mathematics, a skill basic to future success in the subject.

As we use literature as a springboard for learning, questioning, and building curriculum, we build strong math learners who link a seemingly symbolic subject to the real world.

Intended Learning Outcomes

1. Demonstrate a positive learning attitude.
5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

Instructional Procedures

Invitation to Learn

Bring in a small bowl with hungry goldfish in it. Let the children talk about the fish. Sprinkle some fish food in the bowl and watch the fish gulp down their food. Tell the students you are going to read a story about some hungry fish who gulp down their food.

Instructional Procedures

Ten Sly Piranhas

Read the Story *Ten Sly Piranhas*. Have the children help you with the repetitive verse.
Using the *Ten Sly Piranhas* cutouts (cut and colored, with a magnet on the back to be used on a whiteboard), have the children help you retell the story.
Write the number sentences as each problem in the story arises.
Give each child a bag of ten Goldfish crackers and have them eat one at a time as you reread the story.

NOTE: All of the following activities can be done on several levels.

1. Concrete
   , where objects are used.
2. Pictorially
   , where students draw to record what they have done.
3. Symbolically
   , where they use numbers along with their concrete or pictorial representations.

Ten Frame Subtraction

Students put a fish in each of the squares on the *Ten Frame*.
Students take a *Number Card* from the container and remove that many fish from the *Ten Frame*.
Students record their subtraction sentence on *Ten Frame Recording paper*.
Students repeat the procedure until they have filled in the *Ten Frame Recording paper*.

Subtraction Toss

Each student puts a fish on the number ten on the *Fish Number Line*.
Students shake the cube and move backwards that amount on the *Fish Number Line*.
Students record the numbers on the recording master.
The first student to zero wins and the game begins again.
For more advanced students, make a *Fish Number Line* beginning with 20.

Graphing Subtraction

Students take one fish at a time from the paper sack and place it in the appropriate column on the *Fish Graph*.
When one column is filled, students record the numbers, find the difference, and record it on the *Fish Graph Recording sheet*.
When the first graph is finished, students put the fish back in the sack and repeat until the recording sheet is filled.
If two students do the activity, they take turns pulling fish from the sack and both record.

Fishy Subtraction Stories

Students tell a story with their fish counters for each of the Storyboards.
Students record their number story on the white board or chalkboard.

Fishy Journal Entries

Reproduce one journal entry at the top of each page.
Students solve and illustrate each entry.

Extensions

Curriculum Extensions/Adaptations/ Integration

These activities are for numbers ten and under. Advanced learners can do the same activities with numbers up to 30.

For special needs learners, take the numbers down to the zero to five range. They should work with a teacher or adult in small groups or individually.

Science: Integrate this activity with study on fish or food chains.

Family Connections

Students can draw the story at school and retell at home.

Send Ten Sly Piranhas Practice Ideas home with each child.

Assessment Plan

Collect and assess journal entries.

Collect and assess recording sheets.

Have students tell and explain fishy storyboard stories.

Observe and take notes as children participate in each activity.

Bibliography

Research Basis

Moyer, P. S. (2000). Communicating mathematically: Children's literature as a natural connection. *The Reading Teacher*. 54 (3) 246-55.

Children's literature provides a context through which mathematical concepts, patterns, problem solving, and real-world contexts may be explored. Opportunities for the development of mathematical ideas arise naturally from children's books. These daily connections are vital if children are to learn to speak and write the language of mathematics. Many children have difficulty communicating mathematically. Teachers who promote mathematical discussion throughout the curriculum are developing key abilities in students that will serve them well in communicating mathematically throughout their lives.

Protheroe, Nancy (2004). Motivating Reluctant Learners. *Principal*. 84 (1) 46-48.

One of the most compelling strategies to motivate reluctant learners is to make learning relevant to their lives. By making connections between students' experiences and the curriculum, introducing new lessons and concepts with activities that draw on their experiences, and teaching subject matter so it is important to students will motivate the reluctant learner. Using engaging, well-written literature is one way to engage early childhood students in mathematics and help them make connections to their world and previous knowledge.

Authors

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