Just Graph It!

Summary

Students will participate in a variety of graphing centers to learn how to collect and organize data.

Main Core Tie

Mathematics Kindergarten

Strand: MEASUREMENT AND DATA (K.MD) Standard K.MD.3

Additional Core Ties

Mathematics Kindergarten

Strand: MEASUREMENT AND DATA (K.MD) Standard K.MD.2

Materials

Background for Teachers

Graphing is a problem-solving tool used to help young children see relationships.
Graphs are not only valuable instruments for communicating data quickly and simply, but they can be tools for stimulating discussion, and aid in promoting mathematical thinking. Graphing activities for kindergarten students should include more than fixed displays of information. A hands-on, relevant lesson can be a successful way of teaching concepts which students are more likely to retain.
Learning should be supported with manipulatives. Manipulative materials help make abstract mathematical ideas concrete. They give children the chance to grab onto mathematical ideas, turn them around, and view them in different ways. Manipulative materials can serve in several ways to introduce concepts, to pose problems and to use as tools to figure out solutions. When children have the opportunity to work in centers with manipulatives they are making math connections by discovering learning on their own.
Students should have a basic knowledge of the following before they start working independently in graphing centers.

- Counting up to ten objects
- Identifying the numerals 0 through 10
- Identifying colors
- Identifying some bars as taller, longer, or shorter than others
- Comparing two sets of objects to determine which has more (or fewer) objects or if both sets have the same number of objects.

Real graphs are the most important of these graphing experiences. They form the foundation of all graphing activities. In this kind of graph children compare groups of real objects such as M&M's or skittles.
Picture graphs use pictures or models to stand for real things. These graphs are more abstract than real graphs because a picture, even if it is drawn by the child, only represents reality. An image of an M&M is not the M&M itself.
Symbolic graphs use symbols to stand for real things. This is the most abstract level of graphing, because the symbols must be translated back into reality to have meaning. A colored square or an "X" on a piece of graph paper can only stand, abstractly, for a real M&M which the child has.

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

Extensions

Assessment Plan

Teacher observation is the best assessment for these graphing activities. Walk around with a clipboard and post-it notes to make quick notes of which students need special help, or use the class notes recording form attached in the Appendix. The following questions can be used to assess student learning.

Which column has the least?
Which column has the most?
Are there more _____ or more_____?
Are there less _____ or less _____?
How many _____ are there?
How many more _____are there than _____?
How many less _____ are there than _____?
How many _____ are there altogether?
Are any columns the same?
Which row is the longest or tallest?
Which row is the shortest?
Are any rows the same?

Circulate among the students to ensure they are graphing their own data showing their individual information. Observe their understanding of graphing as they work in each of the graphing centers.

Observe the students and listen to the interaction and conversations as they make decisions, organize manipulative and solve problems during the graphing centers.

The written graph and sentences are also good assessment tools, as you see the growth of their oral language.

Bibliography

Research Basis

Friel, S. N., Curfcio, F.R., & Bright, G. W. (2001). Understanding Graphs. Making sense of graphs: critical factors influencing comprehension and instructional implications. *Journal for Research in Mathematics Education*, 32(2), 124-158. Retrieved November 26, 2006.

The Authors have done an extensive search of the research on understanding graphs. Graph comprehension involves "the abilities of graph readers to derive meaning from graphs created by others and themselves." Graph sense "develops gradually as the result of one's creating graphs and using already designed graphs in a variety of problem contests that require making sense of data." "Number sense and symbol sense can be considered as representing certain ways of thinking rather than as bodies of knowledge that can be transmitted to others. A similar approach seems to be a profitable way to think about graph sense. Graph sense develops gradually as a result of one's creating graphs and using already designed graphs in a variety of problem contexts that require making sense of data."

Lilian, K. (1987), Another look at what young children should be learning? *Eric Digest*. Retrieved December 29, 2006.

The data on children's learning suggest that preschool and kindergarten experiences require an intellectually oriented approach in which children interact in small groups as they work together on

projects that help them make increasing sense of their own experience.

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