## Graphing It Daily

Summary
Completing a daily classroom graphs helps students classify, analyze and interpret information in a fun and engaging way.

Main Core Tie
Mathematics Kindergarten
Strand: MEASUREMENT AND DATA (K.MD) Standard K.MD. 3

## Additional Core Ties

Mathematics Kindergarten
Strand: COUNTING AND CARDINALITY (K.CC) Standard K.CC.4.
Mathematics Kindergarten
Strand: COUNTING AND CARDINALITY (K.CC) Standard K.CC.5.
Mathematics Kindergarten
Strand: COUNTING AND CARDINALITY (K.CC) Standard K.CC.6.
Mathematics Kindergarten
Strand: COUNTING AND CARDINALITY (K.CC) Standard K.CC. 7

## Materials

Magnetic dry erase board
Picture of each student
Poster board
Hot glue gun
Dry erase markers

- Just Graph It

Additional Resources
Books

- Navigating through Data Analysis and Probability in Pre-kindergarten-Grade 2 , National Council of Teachers of Mathematics, NCTM (Edited by Carole E. Greenes), ISBN 0:87353-520-0
- Mathematics Their Way
, by Mary Baratta-Lorton; ISBN 020186150X
- Lessons for Little Ones Mathematics Cooperative Learning Lessons , by Lorna Curran in consultation with Dr. Spencer Kagan; ISBN I-879097-19-2
- Mother Goose Math
, by Deborah Scnecter; ISBN: 0-439-15584-3
- Project Criss (Creating Independence through Student-owned Strategies) , by Carol M. Santa H.D., Lynn T. Havens, Evelyn M. Maycumber; ISBN 0-7872-1121-4
- Picturing Math
, by Carol Otis Hurst and Rebe Otis; ISBN 0-02-6873
Childrens Books
- Anno's Flea Market
, by Mitsumasa Anno; ISBN 0-399-21031-8
- Everybody Needs a Rock , by Byrd Baylor; ISBN 0-684-13899-9
- Guess Who My Favorite Person Is
, by Byrd Baylor; ISBN0-684-19514-3
- Hannah's Collections
, by Marthe Jocelyn; ISBN 0-88776-690-0
- Just Graph It!

By CTP Creative Teaching Press; ISBN 1-5747-375-2

- Charts and Graphs
, by Wendy Clemson and David Clemson; ISBN 1-58728-342-5
- Tiger Math
, by Ann Whitehead Nagda and Cindy Bickel; ISBN 0-8050-6248-3


## Background for Teachers

Daily graphing activities include using a personal item that would be of interest to children. The everyday activity of classifying, analyzing and interpreting classifications and drawing conclusions are some of the essential intellectual tasks that people perform. These lifetime skills begin well before kindergarten. Graphing is an extension of a students' natural interest in sorting objects. It is a powerful tool that young children can use to arrange information and establish order.
I have a math bulletin board in my room that is used strictly for the "graph of the day". On top of the board, I place the question for the day. On the rim of the chalk tray below the bulletin board, I place the categories for the graph. Each student has a square wood block with their copied black and white picture that has been decorated by the student. (The block also could be decorated and just have their name on it) When the A.M. kindergarten students arrive in the morning or the P.M. kindergarten students arrive in the afternoon, they read the question on the board (or ask the teacher or a classmate to read it) and place their block accordingly. This is just one way of recording the data, using a wide assortment of materials and a variety of organizational methods. This encourages flexible thinking and enables the children to experience many different ways of arranging information which are equally valid. During our calendar time, we discuss our graphing using vocabulary like: how many, most, least, etc. A teacher can ask graphing questions that correlate with the time of year. For example: How do you get to school. (Bus, Walk, Car)

## Intended Learning Outcomes

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

Instructional Procedures
Invitation to Learn
Collecting data as the children arrive is a great attention getter. Collecting data can be done in a variety of ways, using as many different methods and materials as possible help build a lot of curiosity and interest on a daily basis.
Before starting the class daily graph read the children's book Just Graph it! By CTP Creative Teaching Press. This is a fun short story that is telling the children if there is something they want to know, just graph it.
Instructional Procedures
The classroom teacher will prepare the daily classroom graph in advance.
Additional classroom graph suggestions:
A large cake pan with a graph drawn on it or an 18" by 22" magnetic dry erase board. (Make sure it is the right kind of pan that would work with a magnet.) Each child will be given a
jumbo clear accent gem. A small picture will be mod-podged on the flat part of the gem. (This could be a picture of the children or a symbol representing each class.) Then a small heavy piece of poster board will be glued to the picture and a magnet will be hot glued to the poster board. The students will graph their responses by putting their magnet under the correct category.
One square block for each child or a stackable manipulative that can be decorated and written on.
Flat rectangular oil drip pan (for cars) approximately $3 \times 5$ (about 10 dollars at checkers). Clear contact paper
Kerr canning lids (one for each student and the teacher)
Colored construction paper (preferably a light color)
Two rolls of stick on strip magnets or other magnets that have a sticky back.
Sentence strips
Clear heavy plastic
Colored masking tape
Cover the oil pan with the clear contact paper. Draw a simple grid. Six rows going horizontally work great. Leave about three or four inches open at one end to write in the answers to the questions. If you leave the right end open, this allows 14 votes in any one row. Cut circles to fit inside the lids. Prepare the Kerr lids by attaching the magnets on the back. Have the children draw their faces and write their name inside the bottom arch to make it special identification badge. (If you have student pictures, these could be used instead.) Make a clear slot by taping with colored masking tape around heavy-duty plastic, leaving one end open for a sentence strip. When posting a graphing question, write it on a sentence strip and slide it into the slot provided at the top of the oil pan. The children will use the juice lid to place their vote on the graph. On the bottom of the graph will be smaller clear slots to put the categories in. You could write the category or have a picture to represent the category.
Each day as the students arrive they participate in the daily data collection and graphing experience by adding to the class data.
After each student has participated, the teacher leads a discussion about the data collected.
This could be a part of your calendar activities.
Below is an extensive list of graphing questions
A. Two Group Graphs:

Which do you like to color with? Crayons, markers
Which milk do you like? White, chocolate
Do you brush and floss? Brush only, brush \& floss
Which do you like best? Celery, carrot
Are you left or right handed?
Are you a boy or a girl?
Where your hands clean or dirty when you came into the class?
Did you wear a coat or a sweater?
Do you like baths or showers?
How did you feel about coming to school? Happy, sad
B. More than two groups:

How did you get to school? Bus, walk, car
How did you feel on the first day of school? Scared, excited, nervous
How do you like your apples? Sliced, sauce, baked
How do you fasten your shoes? Buckles, laces, Velcro
Would you rather have a pet with ... Fur, Fins, Feathers
What kind of Pizza do you like? Cheese, Pepperoni, Sausage

Which soup do you like best? Chicken Noodle, Vegetable, Tomato
What is you favorite meal? Breakfast, Lunch, Dinner
How old are you? 5, 6, 7
What is your favorite sport? Football, baseball, basketball
What is your favorite dessert? Ice cream, cake, pie
Which fast, food restaurant do you like best? Wendy's, Burger King, McDonald's
How do you feel today? Happy, Mad, Sad
What time did you go to bed last night? 8 o'clock, 9 o'clock, Later
How many televisions are in your house? 1, 2, 3, more
Which holiday do you like best? Halloween, Thanksgiving, April Fool's day
What do you like to receive for presents? Books, toys, money, clothes
What do you like best to write with? Pencil, crayon, marker, chalk
What color is your hair? Brown, blonde, black
What color are your eyes? Green, blue, brown
C. Yes or No Graph

Do you have . . .
A pet (could list any animal), own bedroom, blue eyes, a van, a two-wheel bike, a cowboy hat, any brothers, any sisters, hair longer than your shoulder (shorter than shoulders), any brothers or sisters in this school (in preschool, in high school), a middle name, buckles on your shoes, a teddy bear, TV in you bedroom, a computer at home, etc.
Do you like . . .
Watermelon, broccoli, macaroni and cheese, oatmeal, (could list any fruit or vegetables, or food), dogs (could list any animal), to watch sports, to read, etc.
Have you ever . . .
Been to Disneyland (list any popular place), been to a zoo, been to a circus, been to the ocean, a farm, gone fishing, ridden a horse, had chicken pox, had to wear a cast, taken dancing lessons, piano lessons, been on a plane, been on a beach, ridden a train, had to stay over night in the hospital, ridden a buggy pulled by a horse, baked cookies, mailed a letter, went to a different school, played the game "Sorry" (could list any game), etc.
Do you enjoy . . .
Riding a bike, playing ball (list any sport), going to school, etc.
Can you...
Ride a two-wheel bike, do flips, jump off the diving board, skip a rope, do magic tricks, walk to school by yourself, etc.
Did you sleep well last night?
Did you brush your teeth today?
D. Favorites

Holiday, season, pizza, sport fruit, vegetable, meat, dessert, movie, cookie, pie, juice, cereal, book, TV show, cartoon, super hero, center, dinosaur, game, ice cream flavor, story character, music, pet, toothpaste, transportation, etc. (When you are doing favorites, narrow it down to three choices and then make a class graph.)

## E. Seasonal

Do you have a real or artificial tree?
Do you have a wreath on your door?
Do you have Christmas lights outside your house?
Have you hung up a stocking?
Did you make a resolution for the New Year?
Are you wearing green today?
Do you have turkey for Thanksgiving?

Do you eat dinner at home or away on Thanksgiving?
What did you wear for Halloween?
What type of Halloween candy do you like?
Does your jacket have a hood?
What do you wear to keep your hands warm? Mittens- gloves
F. Miscellaneous/Numbers

Month you were born in.
Number of bedrooms in your house
Number of brothers and sisters
Number of letters in your first name
Number of pets at home
Number of pockets on your clothing
Number of teeth lost
Shirt: pattern or solid color
Type of clothing worn that day: shorts, pants, t-shirt, sweater, vest, etc.
Types of job they would like to have when they grow up

## Extensions

> Although your class will have many worthwhile and enjoyable experiences graphing the above ideas, the most valuable graphs will be those that evolve spontaneously. For example: A scissor graph showing scissors that cut well and a pair that doesn't cut well might evolve during an art lesson. A glue graph may also evolve during art showing glues that are working well and those that are plugged or not working well.
> Use the above ideas as catalysts for other ideas. As you try these activities, ask yourself, "how else might I use this idea? What other question could I ask in order to generate a similar graph? How else could I organize this information?"
> Instead of using their boxes the students could draw their own pictures. How did you get to school? (They would draw a bus, feet, or car on the bar graph.)
> Visual objects could be used on the graph:

Two to three video movie boxes have the students graph their favorite movie.
Provide two to three cookies and have the students graph their favorite one.
Provide two to three different juice cans and have the students graph their favorite.
Provide two to three different kinds of cereal and have the students graph their favorite.
Other materials the students could use daily in their graphing:
A. If your graphing space is a dry erase board the students could have their name or picture laminated and a magnet backing could be put on each picture, or they could write their name on the dry erase board under the category graphed.
B. You could have a graph taped on the floor in your classroom and they could graph real objects. "Are you wearing boots or shoes? (They would each take off a shoe and put it on the graph.) Are the soles of your shoes smooth or bumpy" (Once again they would take off a shoe and put it on the graph.)
C. The graph could be a heavy cardboard and the children could use clothespins with their name on. They would graph by clipping the clothespin on the cardboard (In order to use this you would only be using a two group graph).
D. For yes and no questions you could have the words written in large block form and the students could write their name inside the letters in the words.
E . The students could also use links. A hook is at the bottom of the graph and the first student hooks their link on the hook and the others link theirs on the link.
Family Connections

Send home a grid of a graph. The student could graph windows, doors, etc., and discuss their findings with their family. They could then bring back the home connection graph and explain their findings to the class or compare their findings with other student findings. Following class units you could send home a graph the family could graph together. For example, after studying the four seasons you could send home a graph, with the question: what is your favorite season? This also serves as a wonderful assessment of student understanding.

## Assessment Plan

The daily questions about the daily graph would be asked and discussed. Sharing recordings and discussing the daily graph allows students to formulate their thoughts using appropriate vocabulary, and to clarify and extend their understanding. This enables the teacher to assess what they know and can apply, where they are in the process of learning, and what they still need.
Assessment for the daily graphing could also come from the various extensions done in class. For example, the teacher might assess a student's journal writing on the daily graph, or assess how a child might transfer information from the class graph onto an individual graph. Using key questions gives the teacher the opportunity to observe and evaluate the students understanding.

Bibliography
Research Basis
Alex Bogomolny (1999). Cut the knot! Where to start? MAA online, the Mathematical Association of America. Retrieved December 27, 2006, from www.maa.org/ editorial/knot/reform.html Research findings from psychology indicate that learning does not occur by passive absorption alone. Instead, in many situations, individuals approach a new task with prior knowledge, assimilate new information, and construct their own meanings.
Teachers need to create an environment that encourages children to explore, develop, test, discuss, and apply ideas. They need to listen carefully to children and to guide the development of their ideas. Hurst C. O., and Otis R. (1996), Data gathering and analyzing, picturing math pre- kindergarten through 2nd grade, chapter 1, sec.3. Retrieved December 30, 2006, from www.carolhurst.com/subjets/math/datagather.html.
Gathering data is a frequent part of solving problems and satisfying curiosity. When we conduct surveys and draw conclusions from them, we are gathering and analyzing data. This includes a lot of work with graphs and leads to mathematical tools like averaging and other computations.

## Authors

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