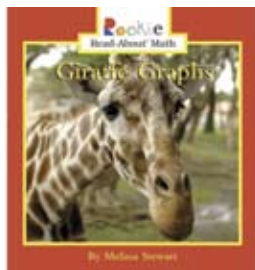


## Going Wild With Graphs

By Karen Ansberry and Emily Morgan

Just as words can tell a story, so can graphs. Pick up a newspaper or magazine and you will probably see several articles accompanied by graphs. Graphs are useful because they communicate information visually and can usually be read more quickly than the raw data from which they are made. This month's lessons use the high-interest topic of zoo animals to teach students about using graphs to organize and communicate data.

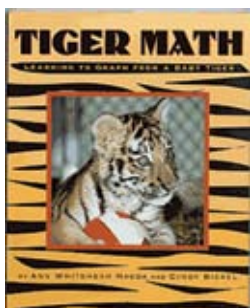
### This Month's Trade Books



*Giraffe Graphs*  
By Melissa Stewart.  
Scholastic. 2007.  
ISBN 0516245945.  
Grades K–4

#### Synopsis

In this Rookie Read-About Math book, a group of students take a field trip to the zoo where they learn how to tally numbers and create graphs. Colorful photos and simple text introduce students to graphing.



*Tiger Math: Learning to Graph from a Baby Tiger*  
By Ann Whitehead Nagda and Cindy Bickel.  
Henry Holt and Company. 2000.  
ISBN 080507161X.  
Grades K–4

#### Synopsis

Readers are introduced to picture graphs, circle graphs, bar graphs, and line graphs—all which help tell the story of T.J., an orphaned Siberian tiger cub born at the Denver Zoo.

### Curricular Connections

One of the essential tools of scientific inquiry is the use of mathematics. The Standards state that mathematics can be used by students to ask questions; to gather, organize, and present data; and to structure convincing explanations. The lessons in this column feature the



mathematical skills of reading, analyzing, and creating graphs, and they show students how these skills are useful in science.

In the K–2 lesson, students work with an adult helper to find a graph in a magazine, newspaper, or internet article to share the next day. Students then create their own tally chart and bar graph representing their favorite animal pictured in the book. In the 3–6 lesson, students also bring in graphs from newspapers, magazines, or internet articles, which they classify as picture graphs, bar graphs, line graphs, and circle graphs. They also explain when it is appropriate to use each of these types of graphs. The lesson culminates with students creating their own graphs based on real-life data either shared by a zookeeper or naturalist or collected from observations and measurements of a class pet.

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## For Grades K–2: Favorite Zoo Animal Graphs

### Engage:

Show students the cover of *Giraffe Graphs*. Read aloud the first page of the book and then encourage connections by discussing the following questions: *Have you ever been to a zoo? What types of animals can be found in a zoo? What things could you count at the zoo? What things could you measure at the zoo?* Read the book aloud, providing time for students to answer the questions posed in the book. In addition, have students answer questions about the tally charts and bar graphs found in the book, such as: *What is being counted in this tally chart?* and *What does this graph show?*

### Explore:

*Giraffe Graphs* shows students how bar graphs can be used to share information. The book ends with the challenge: *“When I go home, I’m going to look for graphs in magazines and in the newspaper. Why don’t you look for some graphs, too?”* For homework, have students and their adult helpers locate and cut out graphs in magazines, newspapers, or internet articles to share at school the next day. Remind students not to cut off the graph title and labels, because they help the reader understand what the graph is showing.

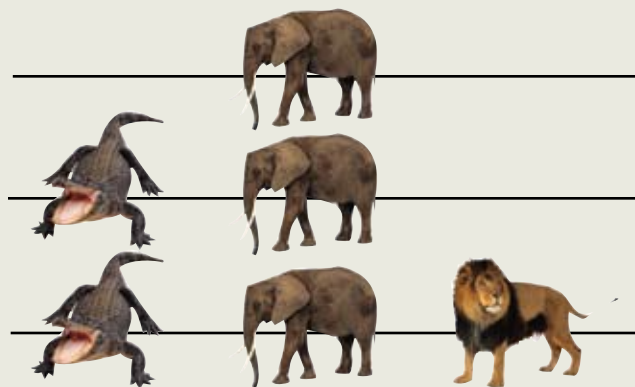
### Explain:

Give students time to share the graphs they have collected with the class. Ask them to read the title and the labels and to explain what they think the graph is showing, for example, “My graph is called Daily Temperatures. It has the days of the week along the bottom of the graph and temperature along the side of the graph. It shows how this week’s temperature changed from day to day.”

Next, have students make a display in the classroom using the graphs.

### Elaborate:

Refer back to *Giraffe Graphs* and ask students if they can remember all of the animals that were shown in the book. Flip through the book to find pictures of zebras, giraffes, elephants, and lions. Pass out the Favorite Zoo



Animals student page (see NSTA Connections) and invite students to think about which of the four animals in the book is their favorite. Have students raise their hands to vote for their favorite and count the votes for each animal. Next, have students record the number of votes for each animal using tally marks on the Favorite Zoo Animals Tally Chart. Students can add up the tally marks and record the sums in the “Total” column and then color in the Favorite Zoo Animals Bar Graph to represent the totals. Next, provide students with a variety of zoo animal pictures or small plastic zoo animals. Have them use these items to practice making tally charts and bar graphs by counting and graphing kinds of animals, number of animals with spots, number of animals with stripes, number of carnivores, number of herbivores, and so on.

### Evaluate:

Using their Favorite Animals Bar Graph, have students answer such questions as: *What does this graph tell you? (The number of votes each animal received.) Which animal was the class favorite? How do you know? (It has the highest bar.) Which animal was the least favorite? How do you know? (It has the lowest bar.) How many more votes did the \_\_\_\_\_ get than the \_\_\_\_\_?* and so on.

### NSTA Connection

The Favorite Zoo Animals student page is available online at [www.nsta.org/SC0710](http://www.nsta.org/SC0710).



## For Grades 3–6: Types of Graphs

### Engage:

Introduce the book *Tiger Math* to students and read the introduction on p. 7. Tell students that just as the introduction suggests, the first time through you will only read the right-hand pages, which tell the story of T.J., a Siberian tiger. As you read T.J.'s story, have students interact with the text by discussing questions such as, *What do you think will happen to T.J.?* (p. 10), *How do you think the zoo staff will get him to eat?* (p. 17), *Have you ever seen kittens or puppies play this way?* (p. 25), and so on. The focus of this first day should be sparking student interest in the story. Tell students that later you will read the graphs on the left-hand pages to learn more and to see exactly how T.J. grew.

### Explore:

For homework, have students search for a graph in a magazine, newspaper, or internet article and answer the following questions about the graph they found: *Where did you find the graph? What is the title of the graph? What are the labels on the graph? What is being counted, measured, or compared? What conclusions can you make from reading the graph?* Give students the opportunity to share their graphs and their answers to these questions.

### Explain:

Read aloud the left-hand pages of *Tiger Math* featuring the graphs. Point out the different types of graphs and the features of each one (e.g., title, labels, numbers, and so on). Ask students to draw conclusions from each graph as you read, such as *There are more Bengal tigers in the wild than any kind of tiger* (p. 8), *T.J.'s weight increased as he got older* (p. 14), and so on.

After reading, ask students if they can recall the four types of graphs shown in *Tiger Math* (picture graphs, bar graphs, line graphs, and circle graphs). Label the board with these five categories: Picture Graphs, Bar Graphs, Line Graphs, Circle Graphs, and Other. Then have students classify the graphs they have collected into these categories. Explain to students that picture graphs and bar graphs are generally used to compare different amounts (such as number of kinds of tigers in the wild on p. 8), line

graphs are typically used to show changes over time (such as the change in T.J.'s weight over 12 weeks on p.18), and circle graphs are typically used to show parts of a whole (such as the percentage of each species of tiger on p. 10).

### Elaborate:

Ideally, students should create a graph using real-life data on an animal. Contact a zoo or nature center and ask if someone there can share data with your class about an animal's weight, height, eating habits, behaviors, and so on. Or, you can have students collect data on classroom pets by measuring the animals and/or observing their activities each day. Be sure to check your school's policy on animals in the classroom. Once data are collected on the animals, students can decide how best to represent that data using graphs.



### Evaluate:

Students can create graphs using the data, explain why they created that type of graph, and share their graphs with the rest of the class in a poster session. A good online resource for helping students create bar graphs, line graphs, and circle graphs is "Create a Graph" from the National Center for Educational Statistics: <http://nces.ed.gov/nc-eskids/createagraph/default.aspx>. This website provides information on how to choose the right type of graph for your data. It also allows students to enter their data and create professional looking graphs that they can print.

### Resource

National Research Council (NRC). 1996. *National science education standards*. Washington, DC: National Academy Press.

## Connecting to the Standards

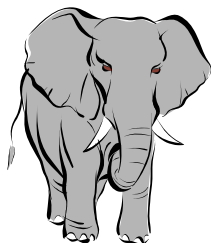
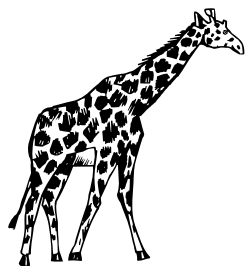
This article addresses the following *National Science Education Standards* (NRC 1996):

### Science Education Program Standards Standard C

The science program should be coordinated with the mathematics program to enhance student use and understanding of mathematics in the study of science and to improve student understanding of mathematics.

Name: \_\_\_\_\_

# Favorite Zoo Animals



Favorite Zoo Animals Tally Chart		
Animal	Tally	Total
Giraffe		
Elephant		
Zebra		
Lion		

## Favorite Zoo Animals Bar Graph

