

# Picture Graphs and Pictographs

## Reading a Graph

Katie's Nature Books



## Math Background

In Grade 2, children extend their understanding of sorting objects and shapes to see that data can also be sorted, organized, and displayed using graphs. Concrete graphs are introduced first. These graphs are formed using one-to-one correspondence featuring a person or an object. For example, people with pockets line up in one row and people without pockets line up in another row. Children can compare the rows to figure out whether more people have pockets or not.

Next, children begin to interpret and create picture graphs. They learn the important characteristics of picture graphs: one-to-one correspondence, how the first item in each row/category on the graph starts at the same baseline, and how the items on the graph are aligned. They also learn that graphs have a title and labels to indicate clearly the type of data that the graph represents. Children also learn to read and create pictographs. Pictographs use symbols to represent data and they include a legend to explain what the symbols represent.

## Purpose

In these activities, children will read and analyze a picture graph. They will identify the typical characteristics of a picture graph, such as a title, labels, one-to-one correspondence, and data starting at a common baseline. They will interpret and compare the data on the graph. Then children will use the data from the picture graph to create a pictograph. They will learn how to use a symbol to represent data. Finally, children will compare picture graphs and pictographs.

## Materials

- A template for making a pictograph (You can make your own template for a pictograph if you wish.)
- Square stickers or coloured squares cut to fit inside the cells of the pictograph template
- Glue (optional)

## Read a Picture Graph

1. Show children the picture graph depicting “Katie’s Nature Books” shown in the visual above. Ask, **How can you tell just by looking that this is a graph?** (It looks like a graphing mat that we used to make our own graph. It has pictures lined up in rows and columns.)
2. Have children examine the picture graph and ask, **What is this graph about?** (Katie’s nature books) **How do you know that?** (The title of the graph tells us.) You may need to prompt children by asking questions such as, **Whose books are these?** (Katie’s books) **How do you know?** (The title at the top of the picture graph tells us.) **What else does the title tell us about the graph?** (It tells us that the books are nature books.)

3. Ask, **Where are the labels on the graph?** Have children point to the labels. **What do the labels tell us?** (They tell us the kind of nature books that Katie has. They tell us that she has nature books about plants, animals, and rocks.)
4. **How do you know how many books about plants Katie has?** (I can count the books above the label "Plants.") **How many books about plants does she have?** (3) Say, **Show me how you found out the number of books about plants that Katie has.** Ask similar questions about Katie's animal books and rock books.
5. **Which kind of nature book does Katie have the most of?** (animal books) **The least of?** (rocks)

### Make a Pictograph

1. Have children make a pictograph using the data from Katie's picture graph. Make a copy of the pictograph template below or make your own pictograph template. You will need 10 stickers that fit in each cell of the pictograph but that do not completely fill the cell. Alternatively, you may also cut out 10 small squares to fit in the cells of the pictograph.
2. Show children the template for the pictograph. Tell them that they are going to learn how to show Katie's information about her nature books in a different way on a different kind of graph.
3. Point to the labels at the bottom of the pictograph template. Ask, **What do these labels tell you?** (the kind of nature books that Katie likes to read)
4. Ask children to look back at the picture graph and ask them, **How many plant books does Katie have?** (3) Show children the stickers and ask, **How many stickers should I put on this part of the graph to show how many plant books Katie has?** (3) **Why do I need three stickers?** (because each sticker represents one book; because each sticker stands for one book)
5. Have children place stickers on the pictograph to show the number of animal books that Katie has and the number of rock books that Katie has. Ask questions such as, **How many stickers do I need to represent Katie's animal books?** (5) **How do you know that?** (There are five pictures of animal books on the first graph and I know that one sticker represents one book.) **Where should I place the first sticker?** (at the bottom of the graph, in the column with the label for animals, at the same baseline as the first sticker in the plant column) **Where should I place the second sticker?** (in the second box; in the second cell)
6. You may wish to talk about why it is important to represent one book with one sticker and that the stickers should be evenly spaced to make the comparison of data easier.
7. Ask, **What is missing on our pictograph?** (a title) **What is a good title for this pictograph?** (Katie's Nature Books) **What else could we call this pictograph?** (Katie's Books)
8. Introduce the concept of including a legend in order to explain the symbol that the children are using on the graph. Ask, **If someone else read our graph, how would they know what each sticker means?** (We could write a note on our graph. We could tell them that each sticker is a symbol meaning one book.) Demonstrate how to add a legend to the graph. Point out to children how one sticker stands for one book.

## Compare the Graphs

1. Have children look at both graphs and ask, **Do Katie's picture graph and the pictograph that we made show the same data?** (Yes.)
2. **Compare Katie's picture graph with the pictograph that we made. Which one makes it easier to compare the numbers of each kind of book?** (the graph we made) Why? (It is easier to compare the heights of the columns on the pictograph, because the stickers are all the same shape and size.)

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Plants

Animals

Rocks

Each \_\_\_\_\_ stands for \_\_\_\_\_.