

Teaching Problem 1

Animal Facts**Teaching Goal**

As children participate in each lesson in this section, they work together to identify the information given in the problem and then make up questions that can be answered with the given information. In this first lesson, children interpret a chart and make up questions about the lengths and weights of three animals—a fish, an eagle, and a guinea pig.

Teaching Plan

1. Present the problem to the class.
2. Read the problem aloud as children follow along.
3. Have children work collaboratively in pairs or in small groups to solve the problem. Point out that there are different ways to go about solving a problem, such as modeling it with manipulatives, acting it out, retelling it (in the child's own words), and by drawing a picture.
4. Lead a whole-group discussion of the problem.

Reading the Problem Aloud

Tell children that they are going to read a chart that gives *data*, or information, about some animals. Ask children what is meant by a "*fact*." Point out that a number fact, such as $4 + 3 = 7$, tells something that is true about a pair of numbers. In much the same way, an animal fact tells something that is true about an animal, such as its length and weight.

You may wish to copy the worksheet chart on the chalkboard. Explain that the words at the top of each *column* tell about the data below it. (The first column names an animal, the second column gives that animal's *length*, and the third column gives that animal's *weight*.)

(continued on page 46)

Materials (optional)

.....
 Inch ruler or yardstick
 Bathroom scale
 Chart paper

Discuss the Meaning of

.....
data
fact
column
length
weight
row

Problem 1 **Animal Facts**

The chart gives the lengths and weights of some animals.

Animal	Length (in inches)	Weight (in pounds)
fish	9	$\frac{1}{2}$
eagle	26	15
guinea pig	11	3

1. Ask a math question about the data in the chart.

2. Ask a different math question about the data.

3. Find the answer to one of your questions. Show how.

Reading the Problem Aloud *continued*

Use an inch ruler or yardstick to draw horizontal lines on the board or on chart paper to represent the animal lengths. Draw a 9-inch-long line next to the first row of the chart to represent the length of a “fish.” Then circle the “9” in the chart as you point out that the length of the line you have drawn is exactly the same as the length of the fish from the tip of its mouth to the tip of its tail. Then repeat the process by drawing a 26-inch-long line to show the length of the “eagle” and an 11-inch-long line to show the length of the “guinea pig.”

Draw children’s attention to the third column of the chart. Suggest that they position a sheet of paper below the *row* for fish in order to help them read across the row to the last column. Explain that this fish weighs one half ($\frac{1}{2}$) of one pound. Show children how to slide the paper downward, row by row, calling on two of them to tell the weights of the eagle and the guinea pig. Discuss the fact that the lengths of the animals are given in inches and that the weights are given in pounds.

- ▶ To reinforce understanding of the meaning of weight, you may wish to do the following demonstration using a bathroom scale. Ask for volunteers to be weighed, and then call on one of the smaller children to step onto the scale. Record the child’s weight on the board. Then weigh a variety of classroom objects, recording the name and weight of each. Challenge children to compare how the given weight of each animal compares to the weight of their classmate and/or to the weights of some of the objects. Children may offer responses such as the following.

The pencil sharpener weighs a little less than a pound.

That’s about the same as the fish.

The stack of books weighs 13 pounds. That’s a lot less than what Josh weighs and almost as much as the eagle weighs.

The plant weighs about 6 pounds. That’s as much as two guinea pigs!

Point out that teachers usually ask math questions for children to answer. Say that today the children will have the chance to be the teacher and ask some math questions that they and others in the class can answer.

- ▶ Read item 1 aloud: **“Ask a math question about the data in the chart.”** Tell children that now they will be a teacher and ask math questions. They can do this by telling a math story about the animal facts and then turning the story into a question. Give the following example:

Math Story

That fish in the pond is 9 inches long, and the eagle in the tree is 26 inches long.

Question

How much longer is the eagle than the fish? *Or* How many more inches would the fish have to grow to be as long as the eagle?

Other questions that children might ask include:

How much longer is the eagle than the guinea pig?

If three fish were lined up nose to tail, how long would they be all together?

How many guinea pigs together would weigh the same as one eagle?

- ▶ Read aloud items 2 and 3: **“Ask a different math question about the data”** and **“Find the answer to one of your questions. Show how.”** After children write the answer to one of their questions, they can ask the same question of their partners or of others in their group. Then they can exchange papers and compare their answers.

Listen for any questions that either do not require the use of math to answer or that cannot be answered at all. For example, suppose a child asks, “How much longer is the eagle than its weight?” You would point out that only like measurements can be compared—length with length and weight with weight. Different kinds of measurements, such as length and weight, cannot be compared. (After commenting in this way, allow time for the child to revise the question so that it becomes answerable.)