Grade 4 Mathematics
Data Analysis, Probability, and Discrete Mathematics:
Lesson 1

Read aloud to the students the material that is printed in **boldface type** inside the boxes. Information in regular type inside the boxes and all information outside the boxes should **not** be read to students. Possible student responses are included in parentheses after the questions.

NOTE: The directions read to students may depend on the available materials. Read only those parts of the lesson that apply to the materials you are using.

Any directions that ask you to do something, such as to turn to a page or to hand out materials to students will have an arrow symbol (⇨) by them.

Purpose of Lesson 1:

- In this lesson, the tutor and the students will
  - ✓ answer questions about the information in a bar graph, pictograph, line graph, or chart/table; and
  - ✓ draw conclusions based on data in a graph.

Equipment/Materials Needed:

- Copies of Student Sheets 58 and 59 for students
- Paper and pencils

Preparations before beginning Lesson 1:

- Run off 1 copy of Student Sheets 58 and 59 for each student. Cut each of the copies into the two parts.
- Have paper and pencils available.

Lesson 1: Data Analysis

Say:

In this lesson, we will look at bar graphs, pictographs, line graphs, charts and tables.

⇨ Give the students the graph on the top of Student Sheet 58.

Ask:

What kind of graph is this? (bar graph) **What is the title on the graph?** (Favorite School Subjects) **Who was surveyed (asked) about their favorite school subjects?** (4^{th} grade students at Lincoln Elementary School) **What are the numbers 0, 1, 2, 3, etc. at the bottom of the graph?** (the number of votes) **What are reading, spelling, math, and science?** (the subjects) **Which subject received the most votes?** (Math) **How many students liked reading best?** (14 students)

Say:

I want each of you to write 2 questions about the graph similar to the ones I asked. (Give them about 3 minutes to write the questions. Allow each student to ask one question) They should ask things like—which subject received the least, or smallest number, of votes? (spelling) How many more votes did math get than science? (9 votes) How many students in all voted? (53 students)

⇨ Give the students the bottom half of Student Sheet 58.

Ask:

What type of graph is this? (Pictograph or picture graph) **What is the title of the graph?** (4–H Club Plant Sale) **What does each ❀ stand for?** (5 plants sold) **How many plants were sold on Wednesday?** (25 plants) **How many more plants were sold on Monday than Tuesday?** (5 plants) **I want each of you to write a question that could be answered by the graph.** (Allow 3 minutes to write a question.) Ask each of the students to read his/her question and allow the other students to answer. **Suppose I asked the question "How many plants were sold on Tuesday?" and someone answered—3 plants. Would he be correct?** (No.) **Why not? What did he do wrong?** (He forgot that each flower stands for 5 plants sold.) **The answer should have been 15 plants.**

Suppose that next year, you can have the plant sale for only 3 days. Which days of the week would you choose? Why? (Possible responses: Some may say Thursday, Friday, and Saturday because Friday and Saturday were so good and Thursday is the closest day to them. Some may say Wednesday, Friday, and Saturday because these were the days on which the most plants were sold. It doesn't matter. You just want them to think.)

⇨ Give the students the top half of Student Sheet 59.

Ask:

What kind of graph is this? (A line graph) **What is the title of the graph?** (Number of 4^{th} grade students) **What are 1994, 1996, 1998, and 2000?** (years) **What are the numbers 25, 50, 75, etc.?** (the number of students) **What year shows the least number of students?** (1995) **Were there more or fewer students in 1994 than in 1998?** (fewer) **Was there an increase or a decrease in the number of students from 1998 to 2000?** (increase) **What could you say about the number of students from 1998 to 1999?** (The number of students stayed the same.) **If you were asked to predict whether the number of students would increase or decrease in the year 2002, what would you say? Defend your answer.** (Since the number of students has increased since 1995, it would seem logical that the number would continue to increase. Again, you just want them to think about the graph.)

⇨ Give the students the chart on the bottom of Student Sheet 59.

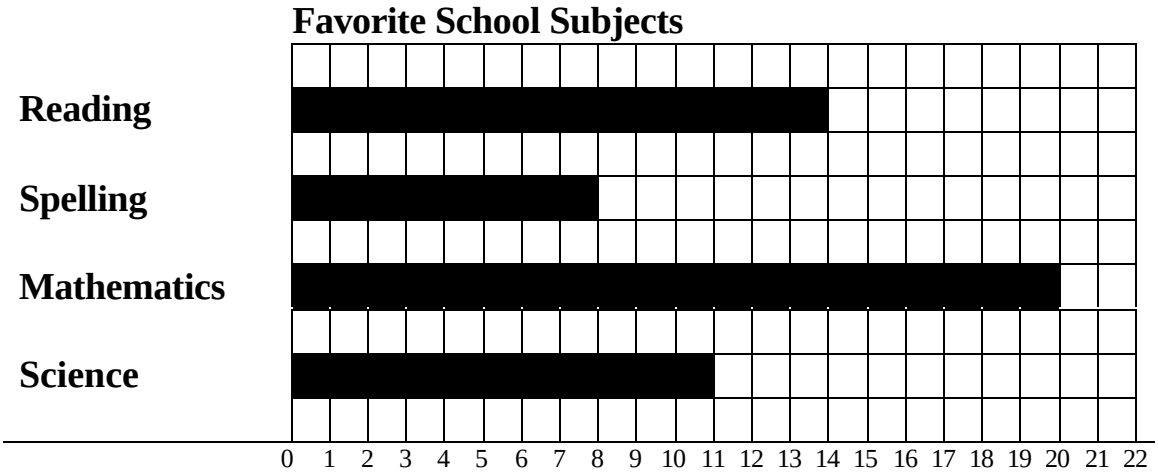
Ask:

What does this chart show? (the high and low temperatures for one week) **What do the 3 columns show?** (days of the week, high temperatures, and low temperatures) **What was the lowest temperature recorded all week?** (66°) **On what day was this low temperature?** (Thursday) **What was the difference in the low temperature and the high temperature on Wednesday?** (a difference of 18°) **I want you to write a question about this chart.** Allow each student to ask his/her question of the other students.

⇨ Have one student summarize today's lesson.

Student Sheet 58 (Data: Lesson 1)

The graph shows the favorite subjects of students in the fourth grade at Lincoln Elementary School.



The graph below shows the number of plants sold in one week by the 4-H Club at the high school.

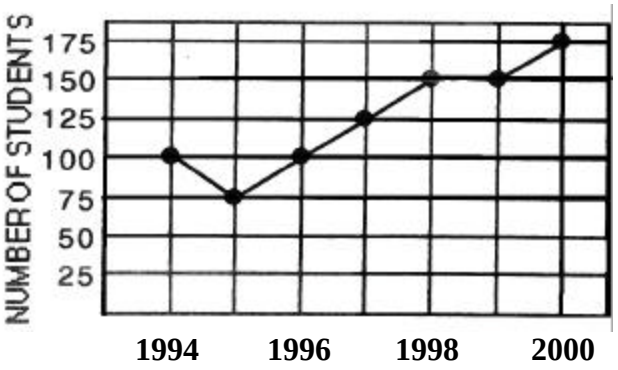
4 – H Club Plant Sale	
Monday	✿ ✿ ✿ ✿
Tuesday	✿ ✿ ✿
Wednesday	✿ ✿ ✿ ✿ ✿
Thursday	✿ ✿
Friday	✿ ✿ ✿ ✿ ✿ ✿ ✿
Saturday	✿ ✿ ✿ ✿ ✿ ✿ ✿ ✿ ✿ ✿

✿ = 5 plants sold

Student Sheet 59 (Data: Lesson 1)

The fourth grade students at Pitre Elementary School made a graph to show the number of fourth grade students at the school from 1994 to 2000.

Number of Fourth Grade Students



The chart shows the high and low temperatures in degrees Fahrenheit for one week in Bunkie.

Days	High Temperature	Low Temperature
Sunday	**95 º**	**72 º**
Monday	**94 º**	**70 º**
Tuesday	**90 º**	**72 º**
Wednesday	**85 º**	**67 º**
Thursday	**96 º**	**66 º**
Friday	**89 º**	**71 º**
Saturday	**94 º**	**72 º**