A pictograph uses pictures or symbols to illustrate data comparisons.

**Life Span of Garbage**

<table>
<thead>
<tr>
<th>Item</th>
<th>Pictograph</th>
</tr>
</thead>
<tbody>
<tr>
<td>cardboard boxes</td>
<td></td>
</tr>
<tr>
<td>camera film</td>
<td></td>
</tr>
<tr>
<td>trash bags</td>
<td></td>
</tr>
<tr>
<td>pantyhose</td>
<td></td>
</tr>
<tr>
<td>soft-drink cans</td>
<td></td>
</tr>
<tr>
<td>plastic bottles</td>
<td></td>
</tr>
<tr>
<td>coated cartons</td>
<td></td>
</tr>
<tr>
<td>leather shoes</td>
<td></td>
</tr>
</tbody>
</table>

**Directions:** Use the information on page 13 and this pictograph to answer these questions.

1. How many years does it take a cardboard box to decay? _____________________________
2. How many years does it take pantyhose to decay? _____________________________
3. How many more years does it take plastic bottles to decay than it takes leather shoes? _________
4. Which two items take the longest to decay? _____________________________
   How many years does each type take? _________
5. How long do plastic-coated cartons take to decay? _____________________________
6. How would this pictograph help communicate the problems of landfills and the value of recycling in this country? _____________________________

**Directions:** This histogram illustrates the frequency of graduation rates in a recent year and the states where this frequency occurs.

7. How many states have between 81% and 90% of its students graduating? _____________________________
8. How many states have between 51% and 60% of its students graduating? _____________________________
9. What percentage of students is graduating in 22 states? _____________________________
10. How many states are represented in all? _____________________________
11. About 65% of California’s public high school students graduate. In what frequency is California recorded on the graph? _____________________________
12. Vermont is the state with the highest graduation rate (89.9%). In what frequency is Vermont included on the graph? _____________________________
13. How might this histogram be used by public officials? _____________________________
A double-bar graph is used to compare two sets of data. The double bar graph shows the percentage of male/female attendance at several major colleges in the United States.

**Male/Female Attendance at Major Colleges**

**Directions:** Use the information on page 13 and this graph to answer these questions.

1. What percentage of students at UCLA is male? ________ What percentage is female? ________
2. What percentage of students at Yale is male? _____ What percentage of students is female? _____
3. What percentage of students at NYU (New York University) is male? ________ What percentage is female? ________
4. In which two colleges is the percentage of male and female students almost the same? ________
5. Which college has the greatest disparity between the percentage of male and female students? ______________________________
6. What is the total percentage of male and female attendance at each college? ______________
   Why? __________________________________________________________________________
7. Using the graph as a representative of college attendance, are more males or more females attending these colleges? _______________________

**Directions:** Study this double bar graph illustrating the points scored by two teams, the Bulldogs and the Wildcats, in the four quarters of a football game.

**Bulldogs/Wildcats Football Game**

8. What was the Bulldogs’ best quarter? ________
9. What was the Wildcats’ best quarter? ________
10. How many total points did each team score in the game? __________________________
11. Which team got better in the first three quarters? ________________________________
12. How might a coach use this graph? ________________________________
A multiple-line graph compares two or more sets of data, which are changing over time. This multiple-line graph illustrates the number of novel pages read by two language arts students, Alyssa and Greg.

Directions: Use the information on page 13 and this graph to answer the following questions.

1. How many pages did Greg read on Sunday? ____________
2. How many pages did Alyssa read on Sunday? _________
3. How many pages did Greg read on Friday? ____________
4. How many pages did Alyssa read on Friday? __________
5. On which day did Greg read the fewest pages? _______
6. On which day did Alyssa read the fewest pages? _____
7. Which student read the most pages during the week? ____________________________________________
8. How many more pages did Alyssa read than Greg on Monday? _________________________________
9. On which three days did Alyssa read exactly five pages more than Greg? ________________________
10. How many total pages did Alyssa read? _____________
11. How many total pages did Greg read? ______________
12. Which student was more consistent in doing the assigned reading? ____________________________
13. How many minutes did Sarah practice the first week? _________________________________________
14. How many minutes did Catherine practice the first week? _________________________________
15. How many minutes did Sarah practice for the entire six weeks? ________________________________
16. How many minutes did Catherine practice for the entire six weeks? ____________________________
17. Which student practiced more in the sixth week? ____________________________________________
18. Did Catherine become a better or worse piano student during the six weeks? _________ Explain.

Key

--- = Alyssa
----- = Greg

Directions: Study this graph illustrating how many minutes Sarah and Catherine practiced playing the piano in a period of six weeks. Answer the questions below.

13. How many minutes did Sarah practice the first week? _________________________________________
14. How many minutes did Catherine practice the first week? _________________________________
15. How many minutes did Sarah practice for the entire six weeks? ________________________________
16. How many minutes did Catherine practice for the entire six weeks? ____________________________
17. Which student practiced more in the sixth week? ____________________________________________
18. Did Catherine become a better or worse piano student during the six weeks? _________ Explain. 

Key

--- = Sarah
----- = Catherine
This circle graph illustrates which elements are most abundant in the earth's crust.

**Directions:** Use the information on page 9 and the circle graph to answer these questions.

1. Which is the most abundant element in the earth’s crust? _________________________
2. Which two elements make up three-fourth’s of the earth’s crust? ____________________
   __________________________________________________
3. Which two elements together are equal to the amount of aluminum in the earth’s crust?
   __________________________________________________
4. Where would carbon, hydrogen, and sodium be included? __________________________
5. Which element makes up almost half of the earth’s crust? _________________________

This circle graph illustrates the percentages of each major element in the human body.

6. Which element makes up more than half of the human body? _______________________
7. How much higher is the percentage of carbon than the percentage of nitrogen? _________
8. What percentage of the human body do the three major elements total? ______________
9. On the graph, where do you think copper, phosphorus, and iron are included?
   __________________________________________________
10. What body compound would have much of the hydrogen and oxygen?_______________
11. Why is this type of graph so easy to use?
    __________________________________________________
    __________________________________________________

**Extension**
- Survey 10 members of your class to determine their favorite pizza topping.
  Convert each topping to a percentage. (If three of the ten students prefer pepperoni, that is 30% of the total. If one student prefers cheese, that is 10% of the total.)
- Create a circle graph illustrating the results of your survey.
The two line graphs indicate the number of hours spent on homework for two 8th grade students.

**Number of Hours Spent on Homework**

**Carlos**

<table>
<thead>
<tr>
<th>Days of the Week</th>
<th>Number of Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon.</td>
<td>1</td>
</tr>
<tr>
<td>Tues.</td>
<td>3</td>
</tr>
<tr>
<td>Wed.</td>
<td>5</td>
</tr>
<tr>
<td>Thurs.</td>
<td>7</td>
</tr>
<tr>
<td>Fri.</td>
<td>8</td>
</tr>
<tr>
<td>Sat.</td>
<td>6</td>
</tr>
<tr>
<td>Sun.</td>
<td>2</td>
</tr>
</tbody>
</table>

**Janet**

<table>
<thead>
<tr>
<th>Days of the Week</th>
<th>Number of Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon.</td>
<td>3</td>
</tr>
<tr>
<td>Tues.</td>
<td>3</td>
</tr>
<tr>
<td>Wed.</td>
<td>2</td>
</tr>
<tr>
<td>Thurs.</td>
<td>2</td>
</tr>
<tr>
<td>Fri.</td>
<td>4</td>
</tr>
<tr>
<td>Sat.</td>
<td>8</td>
</tr>
<tr>
<td>Sun.</td>
<td>1</td>
</tr>
</tbody>
</table>

**Directions:** Use the information on page 9 and the two graphs above to answer these questions.

1. How many hours did Carlos spend doing homework on Tuesday? __________________________
2. How many hours did Janet spend doing homework on Tuesday? ___________________________
3. On which day did neither student do any homework? ____________________________________
4. Both students had a huge science project due the Monday of next week. Which student put it off until the end? __________________________
5. Which student is more likely to use time effectively? __________Why? ___________________

6. How many hours did Janet spend on homework this week?______________________________
7. How many hours did Carlos spend on homework this week? __________________________
8. How many hours of homework a day did Carlos average over seven days? _______________

**Extensions**

- On Monday, Justin rode his scooter for 2 ½ hours. He spent the following amounts of time on his scooter for the next six days: 3 hours, 1 ½ hours, ½ hour, 2 hours, 5 ½ hours, and 4 hours. Make a single line graph to illustrate how much time Justin rode each day of the week.
- Make a table estimating how many hours you slept in the last seven days. Then create a single-line graph from this table.
1. How many electoral votes does California have? ____________

2. How many electoral votes does Texas have? _______________

3. What is the interval between numbers on the scale? _____________________________________

4. How many electoral votes does New Jersey have? _______________________________________

5. What is the difference in the number of votes between Michigan and Illinois? _____________

6. Which state has exactly one more electoral vote than Texas? ____________________________

7. What is the total number of electoral votes of the 10 most populated states? ______________

8. How many electoral votes are distributed among the remaining 40 states and the District of Columbia? ______________________________________________________________________

9. Why would a candidate spend more time campaigning in California than in North Carolina? ______________________________________________________________________________________

10. How many more votes than these 10 states would be needed to win a presidential election? ______________________________________________________________________________________

11. Which two pairs of states have the same number of electoral votes as California? ______________________________________________________________________________________

12. Why did the intervals start with 12 votes? ______________________________________________________________________________________

13. What could be misleading about this graph? ______________________________________________________________________________________

**Extension**

Ten students at Arrow Valley Middle School were surveyed to determine the number of times they went to a fast food restaurant in one week. This table shows the results. Use the information to create a single bar graph.

<table>
<thead>
<tr>
<th>Name</th>
<th>Frequency</th>
<th>Name</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>John</td>
<td>3</td>
<td>Freddy</td>
<td>5</td>
</tr>
<tr>
<td>Sherry</td>
<td>6</td>
<td>Elaine</td>
<td>1</td>
</tr>
<tr>
<td>Jimmy</td>
<td>10</td>
<td>Ginette</td>
<td>4</td>
</tr>
<tr>
<td>Alex</td>
<td>0</td>
<td>Harry</td>
<td>3</td>
</tr>
<tr>
<td>Marianne</td>
<td>2</td>
<td>Hector</td>
<td>7</td>
</tr>
</tbody>
</table>