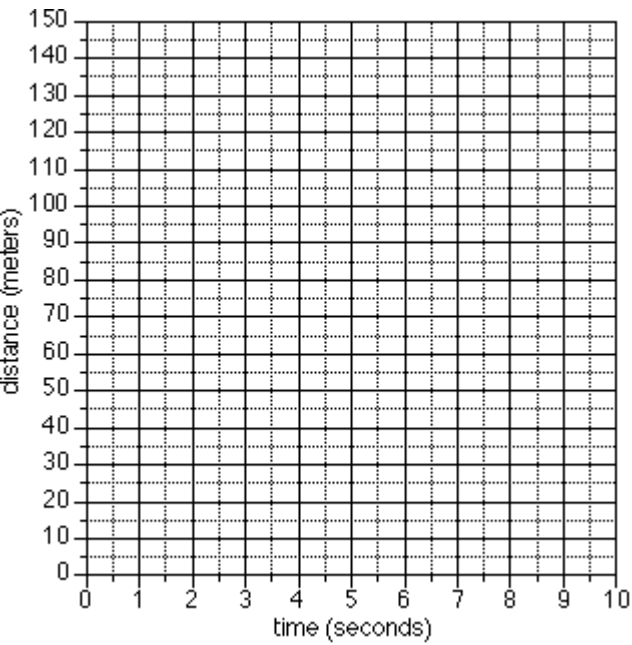


Making Science Graphs and Interpreting Data



Scientific Graphs:

Most scientific graphs are made as **line** graphs. There may be times when other types would be appropriate, but they are rare.

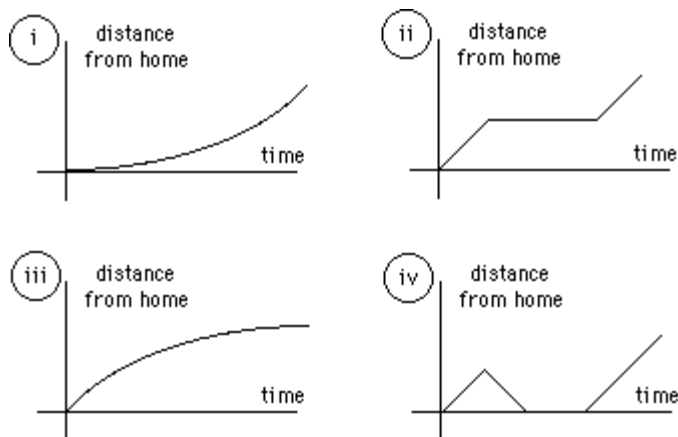
The lines on scientific graphs are usually drawn either **straight** or **curved**. These "smoothed" lines do not have to touch all the data points, but they should at least get close to most of them. They are called **best-fit lines**.

How To Construct a Line Graph On Paper

Step	What To Do	How To Do It
1	Identify the variables	a. Independent Variable (Controlled by the experimenter) Goes on the X axis (horizontal) b. Dependent Variable (Changes with the independent variable) Goes on the Y axis (vertical)
2	To determine the scale of the graph.	a. Determine a scale that fits all the data (The numerical value of each square) b. Spread the graph to use MOST of the available space. c. Each line MUST be of equal value.
3	Number and label each axis.	This tells what data the lines on your graph represent. Label both the x and y axis .
4	Plot the data points.	a. Plot each data value on the graph with a dot.
5	Draw the graph.	a. Draw a curve or a line that best fits the data points.
6	Title the graph.	a. Your title should clearly tell what the graph is about. b. If your graph has more than one set of data, provide a "key" to identify the different lines.

*Practice Interpreting Data:

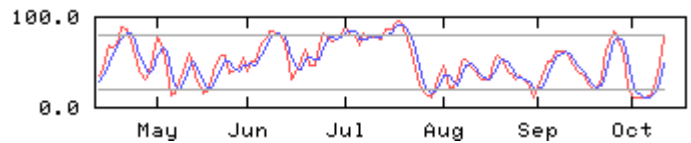
In addition to drawing graphs, it is also important that you be able to interpret data that is represented in graph form. The following examples are provided to help you develop the ability to read information shown on a graph.



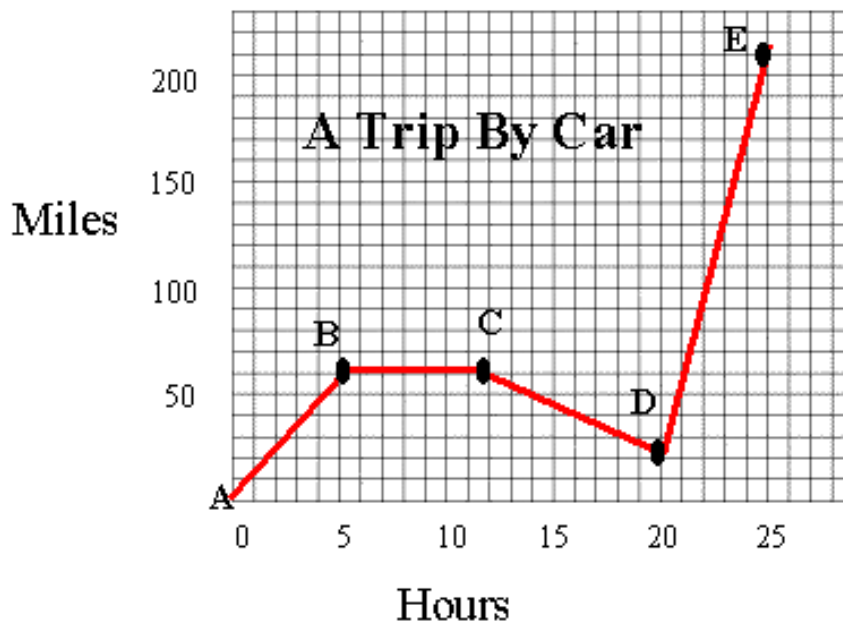
1. Identify the graph from above that matches each of the following stories:
 - a. I had just left home when I realized I had forgotten my books so I went back to pick them up. I ate a snack and then continued my journey.
 - b. Things went fine until I had a flat tire. I fixed it and kept going.
 - c. I started out calmly, but sped up when I realized I was going to be late.



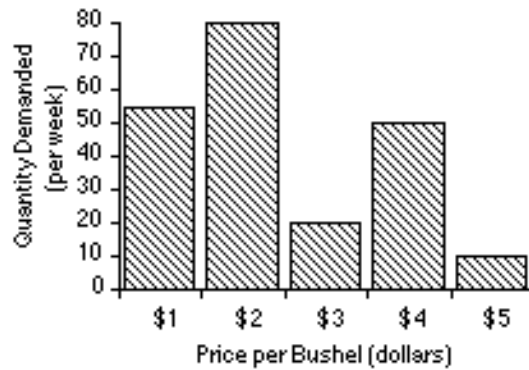
2. The graph at the above represents the typical day of a teenager. Answer these questions:
 - a. What percent of the day is spent watching TV? (Hint: The total pie graph is 100%)
 - b. How many hours are spent sleeping?
 - c. What activity takes up the least amount of time?
 - d. What activity takes up a quarter of the day? (Hint: 25%)
 - e. What two activities take up 50% of the day?
 - f. What two activities take up 25% of the day?



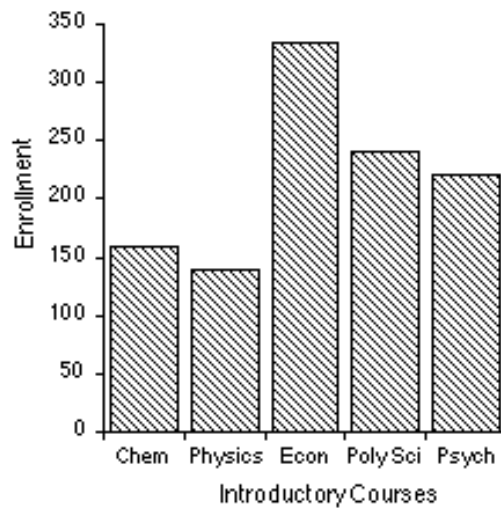
3. Answer these questions about the graph at the right:
- How many sets of data are represented?
 - On approximately what calendar month does the graph begin?
 - In what month does the graph reach its highest point?



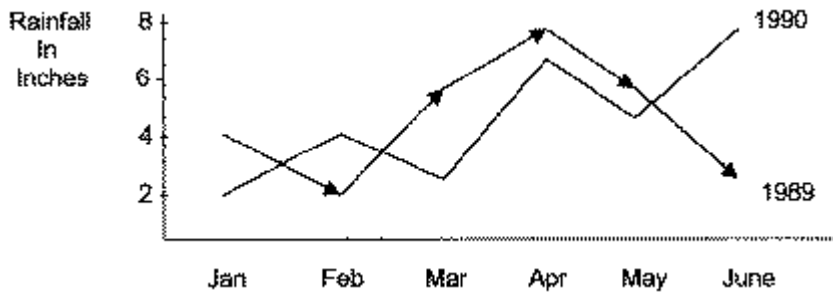
4. Answer these questions about the graph on the above:
- How many total miles did the car travel?
 - What was the average speed of the car for the trip? (Hint: Total Distance / Total Time)
 - Describe the motion of the car between hours 5 and 12?
 - What is happening between points C and D?
 - How many miles were traveled in the first two hours of the trip?
 - Between which two points is the fastest speed?



5. Answer these questions about the graph above:
- What is the dependent variable on this graph?
 - Does the price per bushel always increase with demand?
 - What is the demand when the price is \$5 per bushel?



6. The bar graph above represents the declared majors of freshman enrolling at a university. Answer the following questions:
- What is the total freshman enrollment of the college? (+ or – 50 students)
 - Which major has the most students?
 - How many students are majoring in Physics?
 - How many more students major in Poly Sci than in Psych?



7. Answer these questions based on the graph above.

- How much rain fell in Mar of 1989?
- How much more rain fell in Feb of 1990 than in Feb of 1989?
- Which year had the most rainfall?
- What is the wettest month on the graph?

GRAPH INSTRUCTIONS (10 points)

Pick up a half sheet of graph paper and graph the information on the data table. Be sure to follow the directions!

Time (minutes)	Temperature (degrees C)
0	10
1	30
2	50
3	70
4	90

DIRECTIONS:

- Put time on the X axis and temperature on the Y axis (1)
- Label the axes with what you are measuring and a unit (2)
- Create an appropriate scale that uses most of the graph paper (2)
- Plot the 5 points and connect with a line (3)
- Give the graph an appropriate title (2)

PUT YOUR NAME ON YOUR GRAPH AND STAPLE TO THE ANSWER SHEET YOU ARE TURNING IN.