## **Experimental Design**

Your on the city council, and the fire commissioner comes to request more funding to hire additional firefighters. On the basis of this data, do you hire more firefighters?



Much confusion can be generated by not following the standard convention for plotting data. By convention, the independent variable should be plotted on the *x*-axis and the dependent variable on the *y*-axis.

## **Vocabulary Terms:**

Independent variable — written on the x-axis of a graph. An independent variable is one that is unaffected by changes in dependent variable (e.g. when the influence of temperature on photosynthesis is examined, temperature in the independent variable because it doesn't depend on photosynthetic rate)

*Dependent variable* — written on the *y*-axis of a graph. A dependent variable is dependent on changes in the independent variable (e.g. photosynthesis is dependent on temperature)

*Constants* — factors held constant or unchanged while the dependent variable is tested (e.g. if a food scientist is studying the relationship between the concentration of preservative and the growth rate of bread mold, it is important that temperature, humidity, light, and other factors be the same for all bread used in the study)

*Controls* — a specimen that is not subjected to procedures affecting the rest of the experiment, thus acting as a standard against which the results are compared

## **Interpreting Graphs**

The graphs below show the data from a variety of experiments and studies. For each graph, (a) identify the independent variable, (b) identify the dependent variable, (c) list factors that must be held constant, (d) describe an experiment that would produce such data, and (e) give a simple interpretation of the data.





<u>a)</u>



