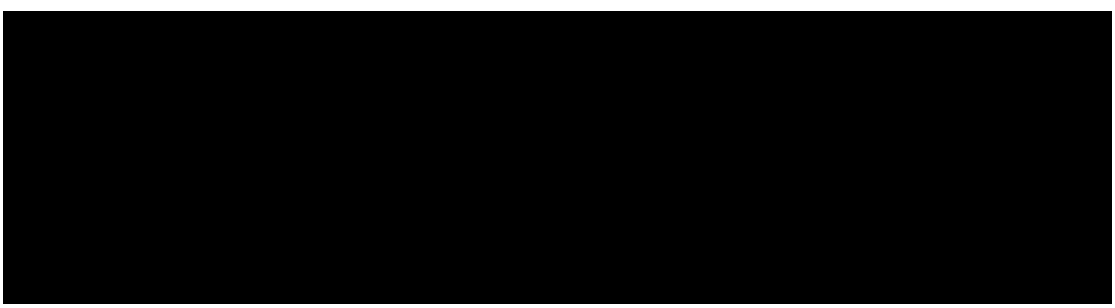
Scatter Diagram

How do you display the relationship between two variables? You can do this by constructing a graph where each pair of data is plotted as a point in a rectangular coordinate plane, similar to what you constructed under *Statistical Investigations*. You can assign one of the variables as x and the other variable as y.

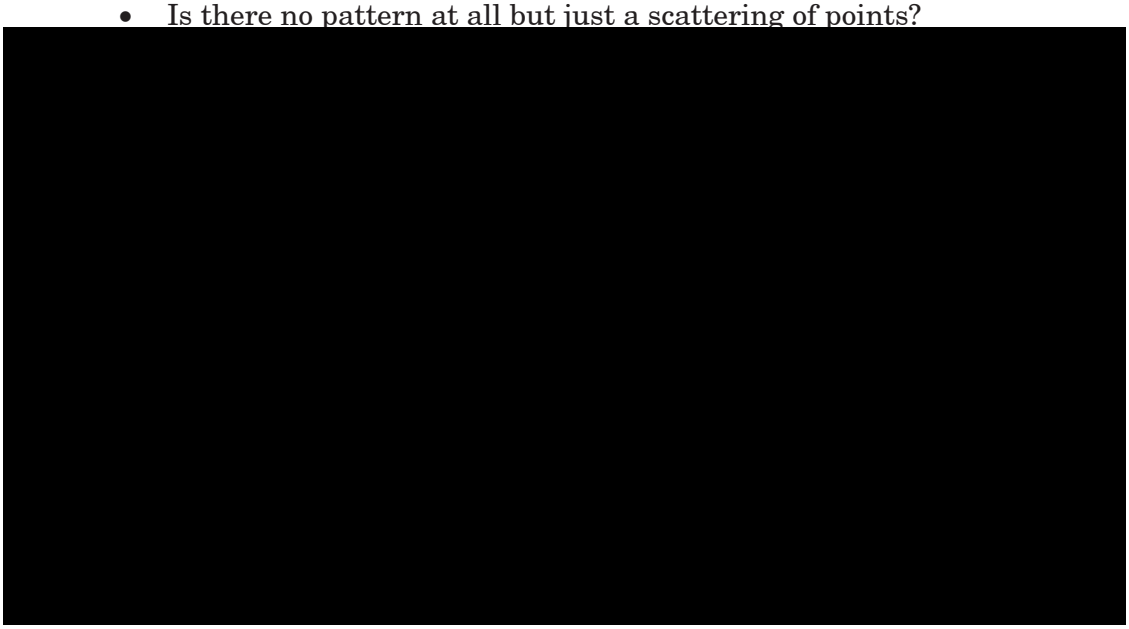
The variable x is often assigned to denote the *independent variable*, while y is often assigned to denote the *dependent variable*. Recall that an independent variable is not affected by the other variable(s), while a dependent variable is affected by changes in the independent variable. A pair of data values can then be represented as an ordered pair (x, y), which can be plotted in a rectangular coordinate plane as a *scatter diagram* or *scatter plot*. A scatter diagram is a tool to graphically analyze the association between two variables.



You can describe the relationship between two variables by looking at the trend or pattern in the scatter plot. You can ask the following questions to interpret the trend shown in a scatter plot.

1. *What trend do you see*?
    - Is there a constant upward trend that follows a straight line pattern?
    - Is there a constant downward trend that follows a straight line pattern?

- Is there a curved or a circular pattern?
- Is there no pattern at all but just a scattering of points?



Example 6.1

Suppose that a sample of 10 students provided measures on heights (in inches) and arm spans (in inches). Construct a scatter plot. What trend do you observe?

Height	*Arm Span*
63	61
59	62
62	63
67	64
62	61
71	72
67	66
59	57
72	72
68	66

Solution.

Plot the data values as ordered pairs with height in the x-axis and arm span in the y-axis. The scatter diagram of the data is as follows:

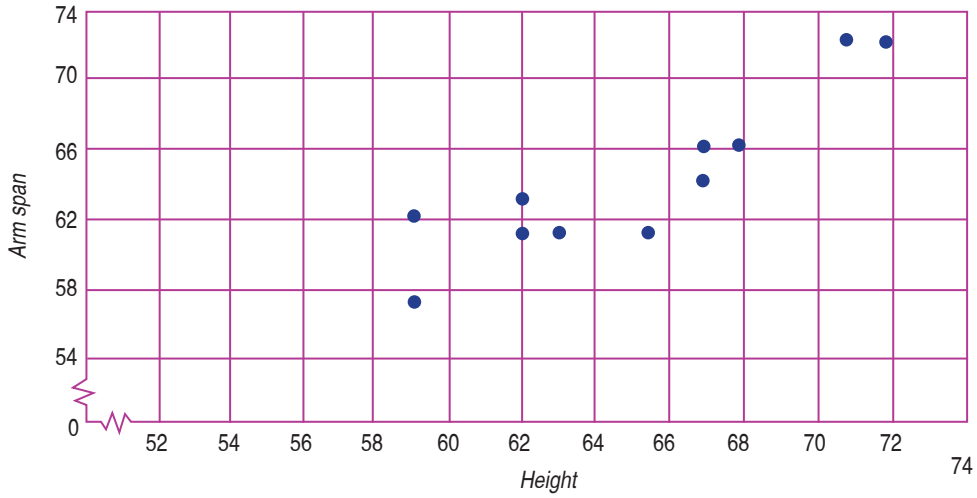


Figure 6.1 Scatter plot of height against arm span