3-8 Reteaching

Scatter Plots and Trend Lines

A **scatter plot** is a graph that relates two different sets of data by displaying them as ordered pairs. A scatter plot can show a trend or correlation, which may be either positive or negative. Or the scatter plot may show no trend or correlation. It is often easier to determine whether there is a correlation by looking at a scatter plot than it is to determine by looking at the numerical data.

If the points on a scatter plot generally slope up to the right, the two sets of data have a positive correlation. If the points on a scatter plot generally slope down to the right, the two sets of data have a negative correlation. If the points on a scatter plot do not seem to generally rise or fall in the same direction, the two sets of data have no correlation.
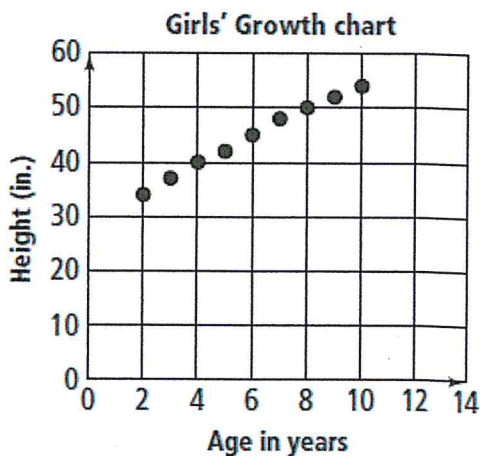
Problem

The table below compares the average height of girls at different ages. Make a scatter plot of the data. What type of correlation does the scatter plot indicate?

Age in years	2	3	4	5	6	7	8	9	10
Height in Inches	34	37	40	42	45	48	50	52	54

Treat the data as ordered pairs. The average height of a 2-year old girl is 34 inches, so one ordered pair is (2, 34). Plot this point. Then plot (3, 37), (4, 40), (5, 42), (6, 45), (7, 48), (8, 50), (9, 52), and (10, 54).

Notice that the height increases as the age increases. There is a positive correlation for this data.

A **trend line** is a line on a scatter plot that is drawn near the points. You can use a trend line to estimate other values.

Girls' Growth chart

Problem

Draw a trend line for the scatter plot in the previous problem. What is the equation for your trend line? What would you estimate to be the average height of a girl who is 12 years old?

Draw a line that seems to fit the data. The line drawn for this data goes through (4, 40) and (8, 50). Use these points to write an equation.

$$x_1 \; y_1 \qquad x_2 \; y_2$$

$$m = \frac{50-40}{8-4} = 2.5 \qquad m = \frac{y_2 - y_1}{x_2 - x_1}$$

Girl's Growth chart

Use the point-slope form of the line.

$$y - y_1 = m(x - x_1)$$
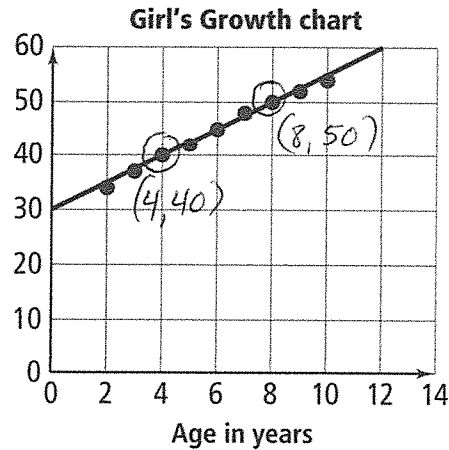
$$y - 40 = 2.5(x - 4)$$

$$y - 40 = 2.5x - 10$$

$$y = 2.5x + 30$$

Use this equation to estimate the average height of 12-year old girls.

$$y = 2.5(12) + 30$$

$$y = 60$$

Exercises

Ryan practices throwing darts. From each distance listed below, he throws 10 darts and records how many times he hits the center.

Distance (in feet)	2	5	7	8	10	12	15
Number of Center Hits							

1. Use the space at the right to make a scatter plot of the data.

2. Describe the type of correlation that is shown in the scatter plot.

3. Draw a trend line.

4. What equation represents your trend line?

5. How many hits do you estimate Ryan would make from 6 feet?