A. Definitions

Line of Best Fit: a line used to fit into data in order to make a prediction about the data.

Scatter Plot: a graph of unconnected points used to determine relationships between the data.
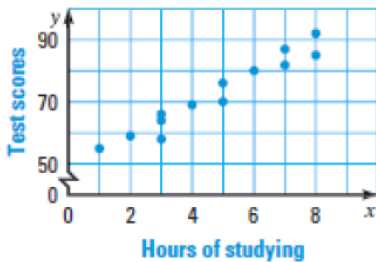
Positive Correlation: occurs when the y-values increase as the x-values increase.

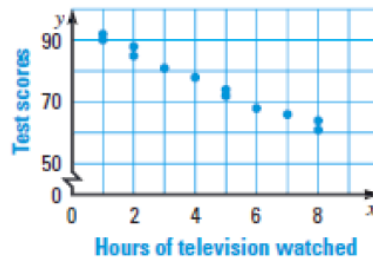Negative Correlation: occurs when the y-values decrease as the x-values increase.

No Correlation: when there is no apparent relationship between the data.

Range Break: a method of showing a break in the y-axis of the graph when all of the data starts a point well above zero. It allows the whole graph to be used to represent the data rather than only a small portion of the graph.
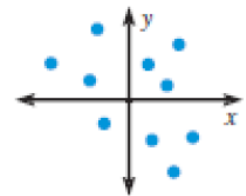
B. Types of Data

Positive Correlation   Negative Correlation   No Correlation

In the first graph we see a positive correlation between the test scores and the hours of studying.   You can see as the x-values increase so do the y-values giving you a trend for the data to move upward (positive on y-axis).

In the second graph we see a negative correlation between test scores and the hours of watching TV. You can see as the x-values increase the y-values decrease giving you a trend for the data to move downward (negative on y-axis).

In the last graph there is no trend at all in the points (neither positive or negative). In this case we would say there is no correlation in the data.

B. Making a Scatterplot

To make a scatterplot, treat the data as a set of ordered pairs and plot the data on a coordinate graph. Make sure to label each axis to represent the relation and use an appropriate scale for each axis that helps to use the majority of the graph to show the data. **Remember your scale must be consistent through the entire axis.**

Mark's Height Over Time

| Age (years)	1	2	3	4	5	6	7	8
Height (cm)	70	82	93	98	106	118	127	135
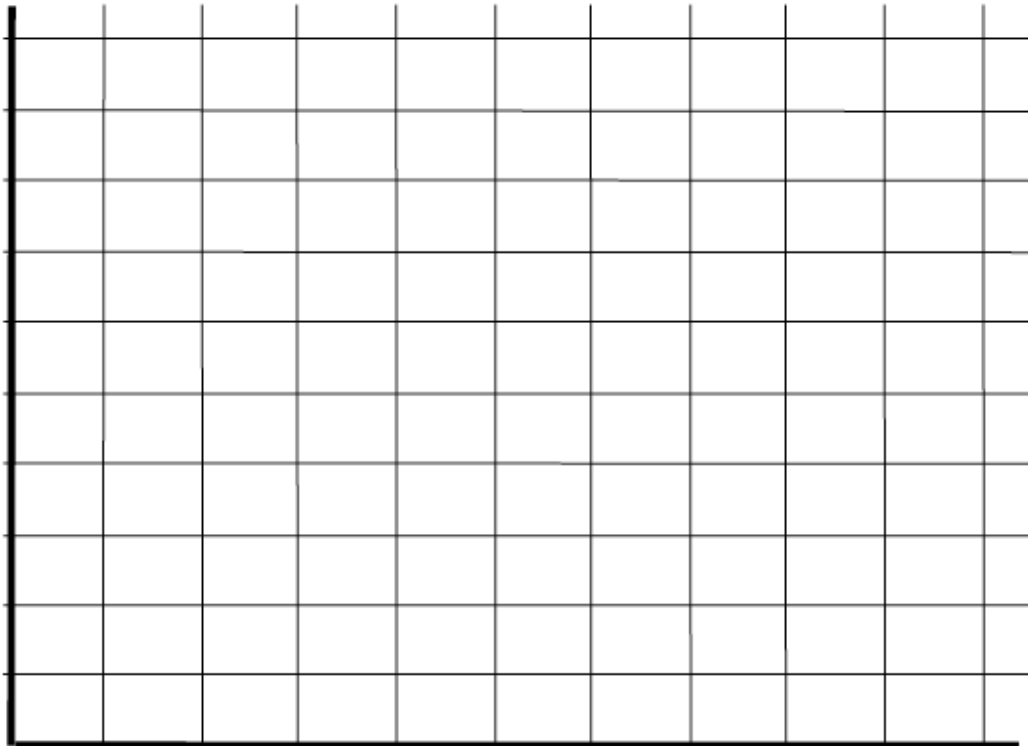
C. Adding a Line of Best Fit

1) Decide if the data shows a correlation. (Either positive or negative)

2) Eyeball a line that appears to fit the data quite closely. There should be about the same number of points above and below the line.

3) The line can be used to make further predictions about the data graphed or beyond.

Length of an Alligator Over Time

Month, x	0	1	2	3	4	5	6	7
Length (in.), y	22.0	22.5	23.5	25.0	26.0	27.5	28.5	29.5
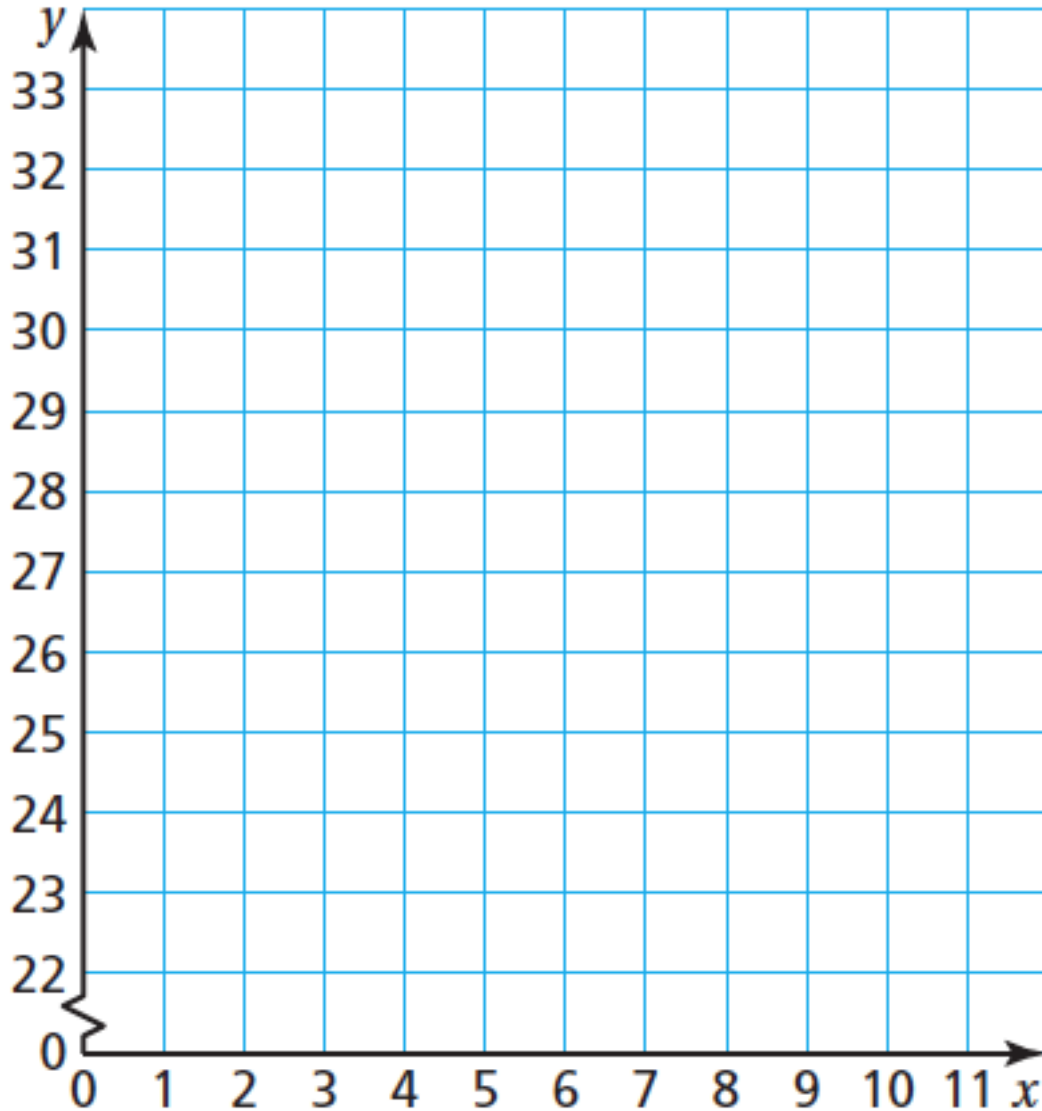
1) Plot the data on the graph and label the axes.

2) Use the data to draw a line of best fit.

3) Use your line of best fit to predict the alligator's length after 10 months.

Assignment: Lines of Best Fit Assignment
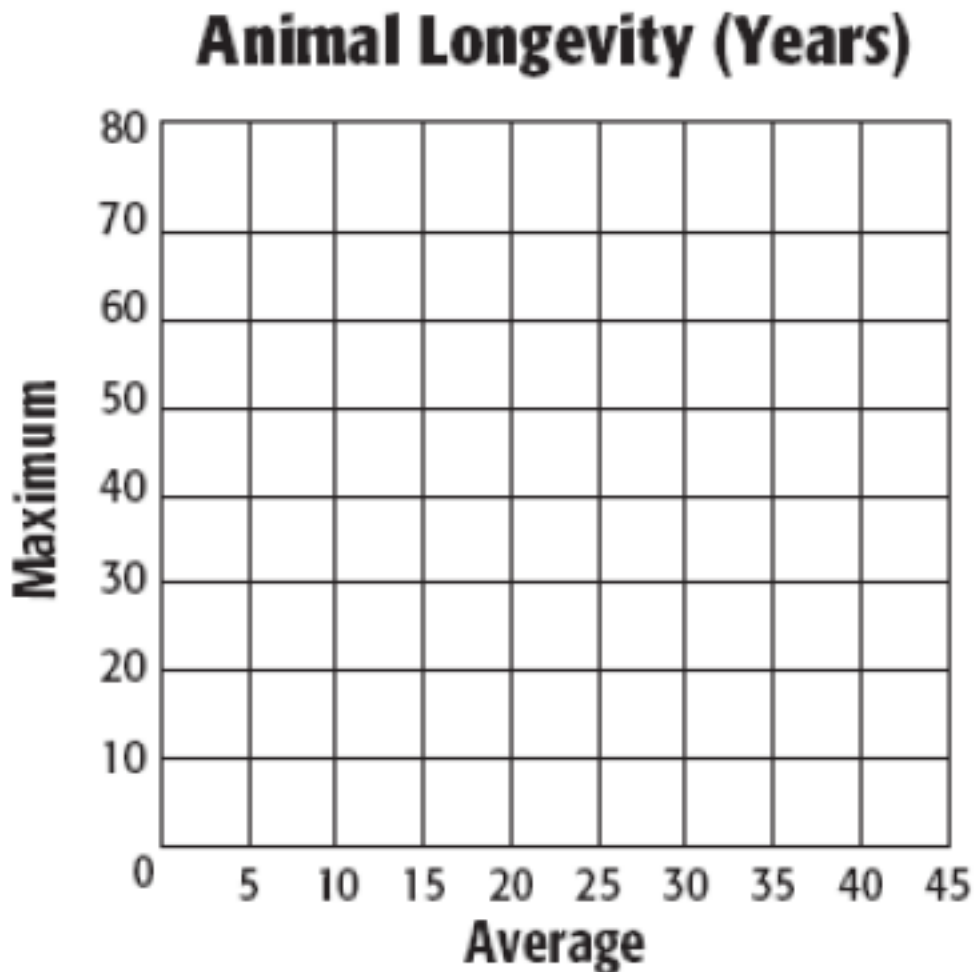
Scatter Plots and Lines of Best Fit

1. The table below shows the predicted annual cost for a famiy to raise a child from birth until adulthood. Graph the data and draw in a line of best fit.

Cost of Raising a Child Born in 2003					
Child's Age	3	6	9	12	15
Annual Cost ($)	10,700	11,700	12,600	15,000	16,700

Annual Cost ($1000)

17
16
15
14
13
12
11
10
9

0   3   6   9   12   15

Age (years)
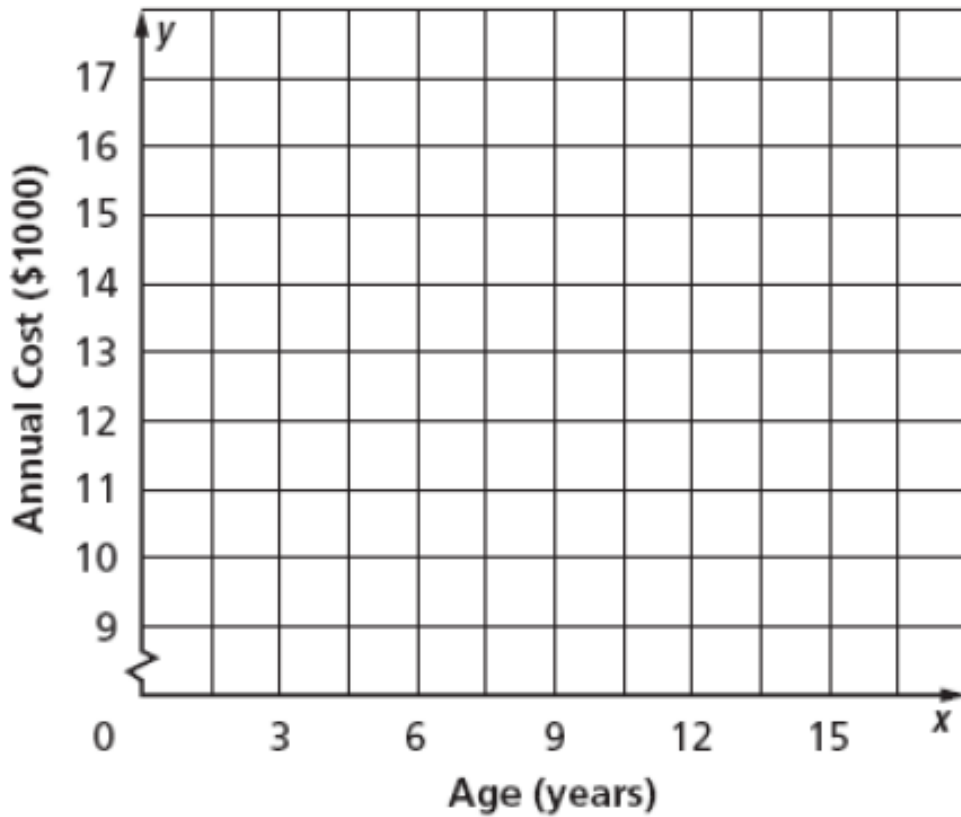
2. The table below shows average and maximum life expectancy of animals kept in captivity. Draw a scatter plot and a line of best fit.

Longevity (years)								
Avg.	12	25	15	8	35	40	41	20
Max.	47	50	40	20	70	77	61	54

Animal Longevity (Years)

3. The table below show the number of cases of Food born Botulism in the United States for the years 2001 to 2005. Draw a scatter plot of the data and draw in a line of best fit.

U.S. Foodborne Botulism Cases					
Year	2001	2002	2003	2004	2005
Cases	39	28	20	16	18

U.S. Foodborne Botulism Cases

Cases

50

40

30

20

10

0   2001   2002   2003   2004   2005

Year
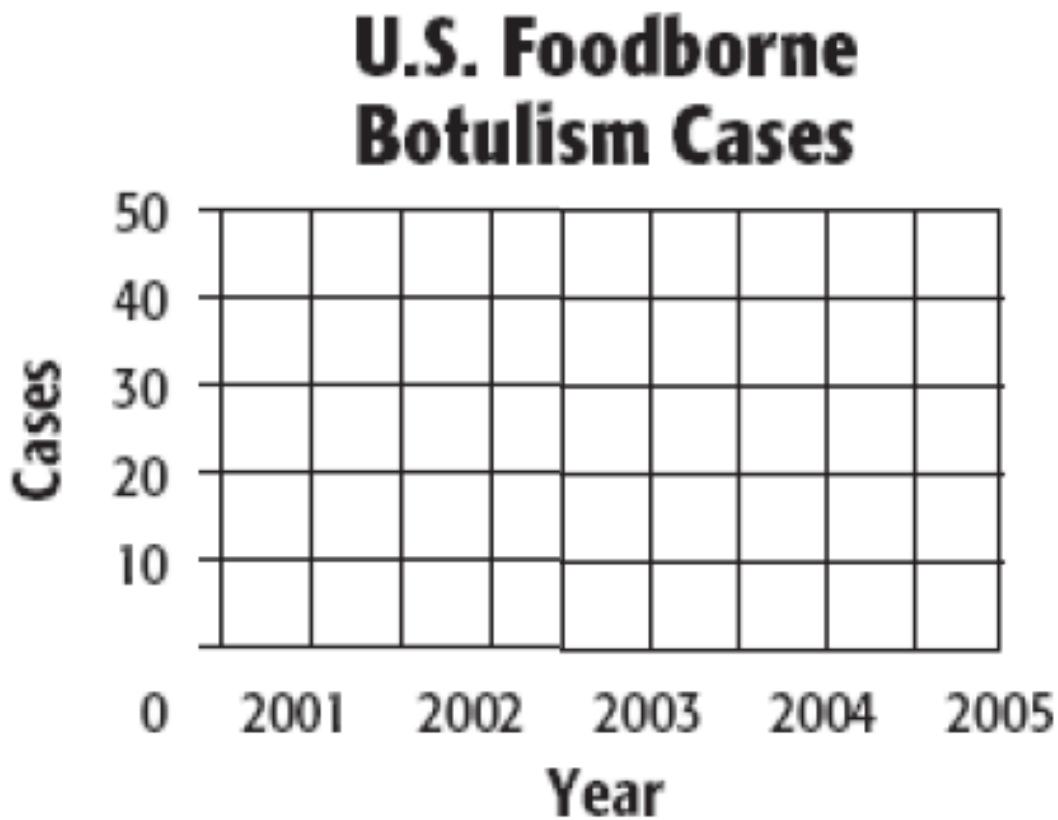
4. The table below shows the number of hours spent studying for a Mathematics Final exam and the final exam grade. Create a scale and label each axis, then draw a scatter plot of the data and a line of best fit.

Study Hours	3	2	5	1	0	4	3
Grade	84	77	92	70	60	90	75

Hours Studying and Final Grade
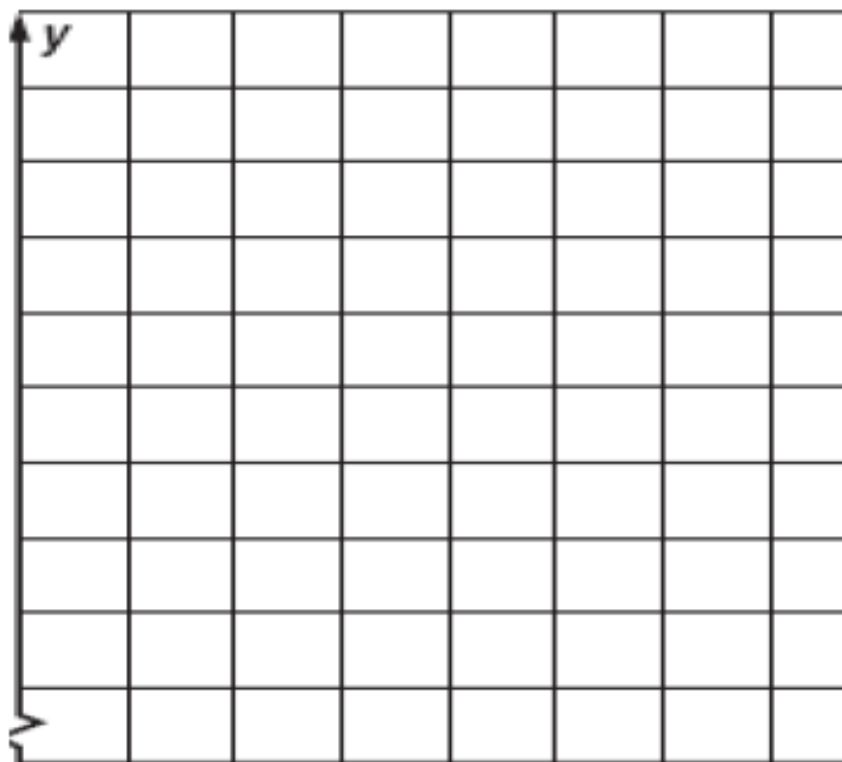
a) Could this line go on forever? Why or why not?