Algebra I
Unit 6: Describing Data

References

HMH Georgia Coordinate Algebra Text:
Unit 4: Modules 14 & 15
HMH Georgia Analytic Geometry Text:
Unit 5: Module 15.3
(quadratic regression)

Check with you teacher for online and print access:

Online website:
my.hrw.com

Web Resources
- GA Virtual: Interpreting and Representing Two Variable Data
http://cms.gavirtualschool.org/Shared/Math/GSEAlgI16/GSEAlgI_IntandRepTwoVarData_Shared/index.html
- Khan Academy
https://www.khanacademy.org/math/probability/regression
- Correlation Coefficient
http://mathbits.com/MathBits/TISection/Statistics2/correlation.htm
- Two-way Frequency Tables
https://mathbitsnotebook.com/Algebra1/StatisticsReg/ST2TwoWayTable.html
- Shapes of Distributions
http://www.mathbitsnotebook.com/Algebra1/StatisticsData/STShapes.html

Dear Parents

Below you will find a list of concepts that your child will use and understand while completing Unit 6: Describing Data. Also included are references, vocabulary and examples that will help you assist your child at home.

Concepts Students will Use and Understand

- Know how to compute the mean, median, interquartile range, and mean absolute deviation by hand in simple cases and using technology with larger data sets.
- Find the lower extreme (minimum), upper extreme (maximum), and quartiles.
- Use and interpret shape, center, and spread of data.
- Create a graphical representation of a data set.
- Summarize data in two-way frequency table.
- Represent data in a scatter plot and describe how the variables are related.
- Interpret the slope & y-intercept of a line from any representation.
- Find linear, quadratic, and exponential regressions.
- Compute and interpret the correlation coefficient.
- Understand the meaning of correlation and causation.

Vocabulary

- **Bivariate data.** Pairs of linked numerical observations. Example: a list of heights and weights for each player on a football team.
- **Conditional Frequencies.** The relative frequencies in the body of a two-way frequency table.
- **Correlation Coefficient.** A measure of the strength of the linear relationship between two variables that is defined in terms of the (sample) covariance of the variables divided by their (sample) standard deviations.
- **Joint Frequencies.** Entries in the body of a two-way frequency table.
- **Marginal Frequencies.** Entries in the "Total" row and "Total" column of a two-way frequency table.
- **Mean Absolute Deviation.** A measure of variation in numerical data by adding the distance between each data point and the mean, then dividing by the number of values
- **Shape**. The shape of a distribution is described by symmetry, number of peaks, direction of skew, or uniformity.
- **Symmetry**. A symmetric distribution can be divided at the center so that each half is a mirror image of the other.
- **Number of Peaks**. Distributions can have few or many peaks. Distributions with one clear peak are called unimodal and distributions with two clear peaks are called bimodal. Unimodal distributions are sometimes called bell-shaped.
- **Direction of Skew**. Some distributions have many more observations on one side of graph than the other. Distributions with a tail on the right toward the higher values are said to be skewed right; and distributions with a tail on the left toward the lower values are said to be skewed left.
- **Uniformity-** When observations in a set of data are equally spread across the range of the distribution, the distribution is called uniform distribution. A uniform distribution has no clear peaks.
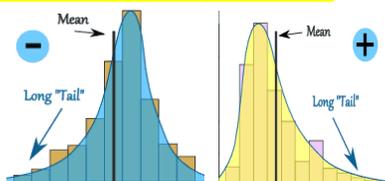- **Trend.** A change (positive, negative or constant) in data values over time.

Practice Problems
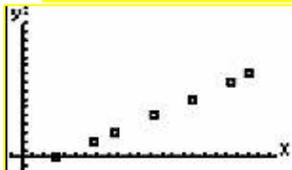
1.) Find the linear regression of the following data:

Fahrenheit degrees (°F)	Celsius degrees (°C)
32	0
68	20
86	30
122	50
158	70
194	90
212	100

2.) Explain when data is skewed left, right, or symmetric.

3.) Using technology, determine the correlation coefficient. Interpret its meaning.
(0,20) (1,40) (2,75) (3,150) (4, 297) (5,510)

4.) Construct a frequency table from the following information:
A survey of 200 9th and 10th graders was given to determine what their favorite subject was. 72 said Math (50 which were freshmen), 38 said Social Studies (20 which were sophomores), and 40 freshmen and 50 sophomores said PE was their favorite.

Based on your tables above, answer the following questions:
a. What are the marginal relative frequencies?
b. What are the joint relative frequencies?
c. What is the probability that a student surveyed is a freshman?
d. What is the probability that a student surveyed likes Math?
e. If a student likes Math, what is the probability that they are a freshman?

	Math	SS	PE	Total
9th	50	18	40	108
10th	22	20	50	92
Total	72	38	90	200