Big Ideas Math: Advanced 2

Parent Newsletter

Chapter 9: Data Analysis and Displays

Standards

Common Core:

8.SP.1: Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.

8.SP.2: Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.

8.SP.3: Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.

8.SP.4: Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.

Essential Questions

How can you construct and interpret a scatter plot?

How can you use data to predict an event?

How can you read and make a two-way table?

How can you display data in a way that helps you make decisions?

Students will...

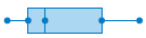
- Construct and interpret scatter plots.
- Describe patterns in scatter plots.
- Find lines of fit.
- Use lines of fit to solve problems.
- Read two-way tables.
- Make and interpret two-way tables.
- Choose appropriate data displays.
- Identify and analyze misleading data displays.

Key Ideas

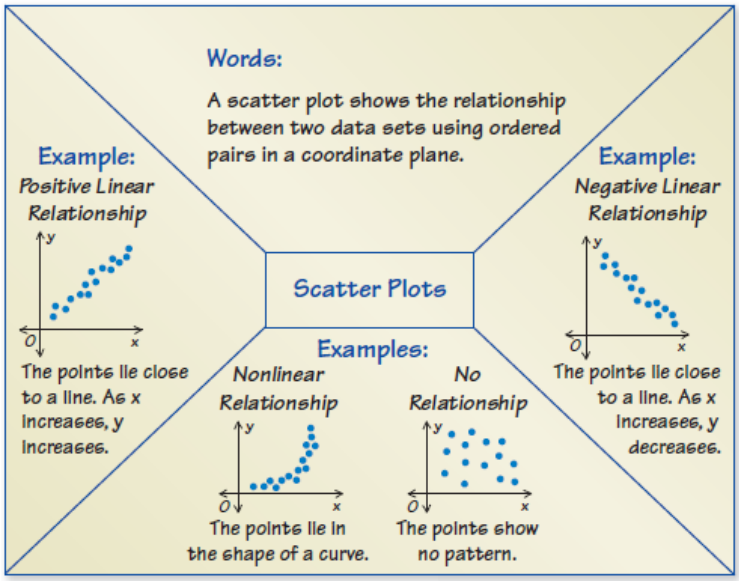
Scatter Plot

A scatter plot is a graph that shows the relationship between two data sets. The two sets of data are graphed as ordered pairs in a coordinate plane.

Data Displays

Data Display		What does it do?
Pictograph		shows data using pictures
Bar Graph		shows data in specific categories
Circle Graph		shows data as parts of a whole
Line Graph		shows how data change over time
Histogram		shows frequencies of data values in intervals of the same size
Stem-and-Leaf Plot		orders numerical data and shows how they are distributed
Box-and-Whisker Plot		shows the variability of a data set by using quartiles
Dot Plot		shows the number of times each value occurs in a data set
Scatter Plot		shows the relationship between two data sets by using ordered pairs in a coordinate plane

Reference Tools



An **Information Frame** can be used to help organize and remember concepts. Write the topic in the middle rectangle. Then write related concepts in the spaces around the rectangle. Related concepts can include *Words, Numbers, Algebra, Example, Definition, Non-Example, Visual, Procedure, Details,* and *Vocabulary*. Place information frames on note cards to use as a quick study reference.

Key Terms

A ***scatter plot*** is a graph that shows the relationship between two data sets.

A ***line of fit*** is a line drawn on a scatter plot close to most of the data points.

A precise line of fit that best models a set of data is called a ***line of best fit***.

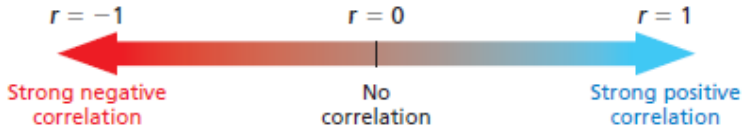
A ***two-way table*** displays two categories of data collected from the same source.

Each entry in a two-way table is called a ***joint frequency***.

The sums of the rows and columns in a two-way table are called ***marginal frequencies***.

Quick Review

- Graphing calculators use a method called *linear regression* to find the line of best fit. A calculator often gives a value r called the *correlation coefficient*. This value tells whether the correlation is positive or negative, and how closely the equation models the data. Values of r range from -1 to 1. When r is close to 1 or -1, there is a strong correlation between the variables. As r gets closer to 0, the correlation becomes weaker.



- A dot plot isolates each data value and shows the frequency of each individual number.
- A scatter plot allows you to see trends in the data. You read a scatter plot from left to right.
- A line of fit does not need to pass through any of the data points.
- When finding an equation of the line of best fit, every point in the data set is used.

What's the Point?

The ability to analyze data and choose appropriate displays is very useful in real life for events like marketing a product. Have your student look through advertisements to find one that uses graphs or charts. Are any of these charts misleading? Then have your student look up the referenced study online to compare the results from the advertisement. Do they convey the same information? Why or why not?

The STEM Videos available online show ways to use mathematics in real-life situations.
The Chapter 9: Fuel Economy STEM Video is available online at www.bigideasmath.com.