

# TOPIC 4

## Investigate Bivariate Data

In this topic, students study and graph sets of data that occur in pairs.



## CONNECT THE MATH

Data analysis and probability are linked because if a data set has a linear (or nonlinear) association, you can use information from that association to estimate probabilities and make predictions.

For example, as demand for a product increases, the price of the product tends to increase (positive association). As your driving speed increases, your gas mileage decreases (negative association).

Populations of birds and animals on the protected and endangered species lists tend to increase over time after protections are put into place. In the early 1990s, the Florida manatee population was about 1,300. In 2000, it was about 1,600. In 2010, it was about 5,000, and by 2020, it was about 5,700. Scientists can use these trends to estimate the 2030 manatee population.





---

## LESSON 4-1

### Construct and Interpret Scatter Plots

A scatter plot is a graph on a coordinate plane that uses points to show the relationship between paired data. These points visually display any clusters, gaps, or outliers.

---

#### LESSON OBJECTIVES

- Construct a scatter plot to model paired data.
- Utilize a scatter plot to identify and interpret the relationship between paired data.

---

#### HOW CAN YOU HELP WITH HOMEWORK

##### Review Lesson Content

Watch and share these video tutorials with your student:

- [What's a Scatter Plot?](#)
- [How Do You Use a Scatter Plot to Find a Positive Correlation?](#)

## Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- [cluster](#)
- [gap](#)
- [measurement data](#)
- [negative association](#)
- [outlier](#)
- [positive association](#)
- [scatter plot](#)

You can use these search terms and phrases to help your student find additional help online:

- constructing a scatter plot
- interpreting a scatter plot



## LESSON 4-2

### Analyze Linear Associations

A trend line on a scatter plot approximates the linear association between the paired data. Scatter plots can show a linear or nonlinear association or no association.

---

### LESSON OBJECTIVES

- Recognize whether the paired data have a linear association, a nonlinear association, or no association.
  - Draw a trend line to determine whether a linear association is positive or negative and strong or weak.
-

## HOW CAN YOU HELP WITH HOMEWORK

### Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Make a Scatter Plot?](#)
- [How Do You Use a Scatter Plot to Find a Line of Fit?](#)

### Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- [trend line](#)

You can use these search terms and phrases to help your student find additional help online:

- recognizing linear associations in data
- recognizing nonlinear associations in data



## LESSON 4-3

### Use Linear Models to Make Predictions

Trend lines in linear models can help with making predictions about a data set. By determining the equation of a linear model, predictions of an outcome can be made.

---

### LESSON OBJECTIVES

- Use the slope and y-intercept of a trend line to make a prediction.
- Make a prediction with no equation is given by drawing trend lines and writing the equation of the linear model.

---

## HOW CAN YOU HELP WITH HOMEWORK

### Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Make Predictions Using a Line of Fit?](#)
- [How Do You Use a Scatter Plot to Find a Negative Correlation?](#)

You can use these search terms and phrases to help your student find additional help online:

- using a scatter plot to make a prediction
- interpreting the slope and y-intercept of a trend line

---

## LESSON 4-4

### Interpret Two-Way Frequency Tables

Data can be displayed in a two-way frequency table, making it easier to analyze data. Individual data categories can be compared to all the data. Individual data can also be compared to sub-categories to make evidence-based conjectures.

---

### LESSON OBJECTIVES

- Organize paired categorical data into a two-way frequency table.
- Compare and make conjectures about data displayed in a two-way frequency table.

---

## HOW CAN YOU HELP WITH HOMEWORK

## Review Lesson Content

Watch and share these video tutorials with your student:

- [What is a Frequency Table?](#)
- [How Do You Make a Frequency Table?](#)

## Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- [categorical data](#)

You can use these search terms and phrases to help your student find additional help online:

- constructing a two-way frequency table
- interpreting a two-way frequency table



## LESSON 4-5

### Interpret Two-Way Relative Frequency Tables

Data can be organized in a two-way frequency table, and then used to construct a two-way relative frequency table. Relative frequency can be determined for the rows and the columns as well as for the whole table.

---

## LESSON OBJECTIVES

- Construct two-way frequency tables.
  - Compare and make conjectures about data displayed in a two-way relative frequency table.
-

## HOW CAN YOU HELP WITH HOMEWORK

### Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Find Relative Frequency?](#)

You can use these search terms and phrases to help your student find additional help online:

- relative frequency tables
- how to calculate relative frequencies