

# learning focus:

- ✓ construct and interpret scatter plots
- ✓ use trend line equations to make predictions
- ✓ display data in two-way tables and calculate relative frequencies

# SCATTER PLOTS & DATA UNIT

## 9 DAY CCSS-ALIGNED UNIT

**8<sup>th</sup>**  
GRADE



A MANEUVERING THE MIDDLE® RESOURCE

# SCATTER PLOTS & DATA



a 9 day CCSS-aligned unit

CCSS: 8.SP.1, 8.SP.2, 8.SP.3, 8.SP.4

**ready-to-go, scaffolded  
student materials**

## SCATTER PLOTS AND DATA UNIT

### Table of Contents

PAGE	TOPIC	RESOURCE
4	Sample Pacing Guide	
5-6	Ideas for Implementation and Helpful Hints	
7-15	Binder Covers, Dividers and Spine Labels	
17-18	Scatter Plots and Association	Student Handout 1
19-20	Scatter Plots and Association	Homework 1
21-22	Constructing Scatter Plots	Student Handout 2
23-24	Constructing Scatter Plots	Homework 2
25-26	Scatter Plots and Predictions	Student Handout 3
27	Scatter Plots and Predictions	Homework 3
29-30	Trend Line Equations	Student Handout 4
31	Trend Line Equations	Homework 4
33-34	Scatter Plots and Trend Lines Quiz	Quiz 1
35-36	Two-Way Tables	Student Handout 5
37-38	Two-Way Tables	Homework 5
39-40	Relative Frequency	Student Handout 6
41-42	Relative Frequency	Homework 6
43-46	Scatter Plots and Data Study Guide	Review
47-50	Scatter Plots and Data Unit Test	Test

©Maneuvering the Middle LLC, 2016

# SCATTER PLOTS & DATA

8<sup>th</sup>  
GRADE

a 9 day CCSS-aligned unit

CCSS: 8.SP.1, 8.SP.2, 8.SP.3, 8.SP.4

student friendly + real-world  
application

higher-level  
analysis

Unit: Scatter Plots and Data  
Student Handout 2

Name \_\_\_\_\_  
Date \_\_\_\_\_ Pd \_\_\_\_\_

CONSTRUCTING SCATTER PLOTS

Jared's basketball team stood at various distances from the basketball hoop and counted the number of baskets they were able to make in 30 seconds. Use the data in the table to make a scatter plot. Then answer the questions that follow.

NAME	DISTANCE FROM HOOP	BASKETS MADE
Jared	15 ft	2
Tyrell	15 ft	0

BASKETS MADE

10  
9  
8  
7  
6  
5  
4  
3  
2  
1

DISTANCE FROM HOOP (FT)

5 10 15 20 25 30 35 40 45 50

1. Describe the type of association seen in the scatter plot.

2. Are the data points clustered?

4. Use the scatter plot to label each statement.  
a. As the distance from the hoop increases, the number of baskets made increases.  
b. As the distance from the hoop increases, the number of baskets made decreases.

Scatter plots may include points known as outliers described below.

OUTLIERS

- A point that does not follow the general trend of the data.
- Which player represents an outlier?

CLUSTERING

- When there are several data points that are close together.
- Why do you think there is clustering?

5

The population of 10 cities and the number of elementary schools in the city is shown in the table.

POPULATION	# ELEMENTARY SCHOOLS
76,000	19
60,000	17
35,000	11

# ELEMENTARY SCHOOLS

30  
27  
24  
21  
18  
15  
12  
9  
6  
3

POPULATION (THOUSANDS)

10 20 30 40 50 60 70

a. Describe any association and conclusions you can make from the graph.  
b. Do you think there is a correlation between population and the number of elementary schools?

6

The table below shows the number of days and the balance of the account.

# DAYS	16	2	2
BALANCE (\$)	5.25	18.50	2.50

ACCOUNT BALANCE (\$)

20  
18  
16  
14  
12  
10  
8  
6  
4  
2

# DAYS

2 4 6 8 10 12 14 16 18 20

Unit: Scatter Plots and Data  
Homework 2

Name \_\_\_\_\_  
Date \_\_\_\_\_ Pd \_\_\_\_\_

CONSTRUCTING SCATTER PLOTS

Rebecca is researching cruises in order to plan a vacation. She records the length and total cost of different cruises in the table. Use the table to answer 1-5.

CRUISE LINE	LENGTH	COST
Fiesta Cruises	6 days	\$515
Aloha Tours	2 days	\$249
Regal Ships	2 days	\$199
Pacific Wonder	7 days	\$679
Ocean Escapes	5 days	\$489
Nautical Excursions	3 days	\$270
Island Hoppers	7 days	\$710
Bon Voyage Trips	4 days	\$920
Harbor Adventures	4 days	\$375
Marine Marvels	5 days	\$600

COST (\$)

1,000  
900  
800  
700  
600  
500  
400  
300  
200  
100

LENGTH OF CRUISE (DAYS)

1 2 3 4 5 6 7 8 9 10

2. Which is a true statement about the data?

a. As the length of a cruise increases, the cost of the cruise increases.  
b. As the length of a cruise decreases, the cost of the cruise decreases.  
c. Both a and b are true.  
d. Neither a nor b are true.

3. Which best describes the association seen between the variables?

a. Positive and linear  
b. Positive and non-linear  
c. Negative and linear  
d. Negative and non-linear

4. Does the data appear to have any outliers? Explain.

5. Does the graph demonstrate clustering? Explain.

engaging  
practice

# SCATTER PLOTS & DATA

8<sup>th</sup>  
GRADE

a 9 day CCSS-aligned unit

CCSS: 8.SP.1, 8.SP.2, 8.SP.3, 8.SP.4

streamline your planning  
process with unit overviews

## SCATTER PLOTS AND DATA OVERVIEW



### STANDARDS

- 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.

### BIG IDEAS

- Scatter plots and relative frequency bivariate categorical data.
- Straight lines and their equations.

### ESSENTIAL QUESTIONS

- How is a scatter plot different from a line graph?
- What purpose does a scatter plot serve?
- What characteristics about a scatter plot are important?
- How can a line of best fit be used to describe a scatter plot?



key vocabulary



vertical alignment



sample  
pacing  
calendar

## SCATTER PLOTS AND DATA UNIT PACING GUIDE



DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Scatter Plots and Association	Constructing Scatter Plots	Scatter Plots and Predictions	Trend Line Equations	Scatter Plots and Trend Lines Quiz
Student Handout 1 Homework 1	Student Handout 2 Homework 2			
DAY 6	DAY 7			
Two-Way Tables	Relative Frequency			
Student Handout 5 Homework 5	Student Handout 6 Homework 6			

## SCATTER PLOTS AND DATA UNIT OVERVIEW



TOPIC	TEACHING TIPS
Scatter Plots and Association	Emphasize to students that variables with positive association <b>move together</b> , rather than increase. Similarly, variables with negative association move in <b>opposite directions</b> rather than decrease. This will help prevent students becoming confused in a situation where one variable decreases the other decreases as well, which is positive association.
Constructing Scatter Plots	I love that this topic can give opportunities for students to get out of their seats and participate in collecting data. For example, have students record how many jumping jacks they can do in certain time intervals (15 seconds, 30 seconds, 45 seconds, etc.). Then, construct a class scatter plot comparing the time with the number of jumping jacks and discuss patterns of association, clustering, outliers, etc.
Scatter Plots and Trend Lines	I usually must remind students that when they are creating an equation for a trend line, they need to choose two points on the actual trend line, not necessarily two of the data points on the scatter plot.
Two-Way Tables	Allow students the chance to develop their own survey questions and collect data on a large two-way table on the white board from the entire class. Students can write their names on a sticky note and place their name on the correct cell of the two-way table.
Relative Frequency	I help students remember the meaning of "relative" by talking about the common phrase "It's all relative." It seems simple, but it's a great way to get them to remember that relative frequency must compare the frequency to a total.

teaching  
ideas



# SCATTER PLOTS & DATA

8<sup>th</sup>  
GRADE

a 9 day CCSS-aligned unit

CCSS: 8.SP.1, 8.SP.2, 8.SP.3, 8.SP.4

## unit study guide + assessments



quizzes



editable unit test

Unit: Scatter Plots and Data  
Quiz 1

Name \_\_\_\_\_  
Date \_\_\_\_\_ Pd \_\_\_\_\_

**QUIZ: SCATTER PLOTS AND TREND LINES**

Answer each question and be sure to show work when necessary.

1. Jeremiah conducts a survey and finds that as the first variable in his survey decreases, the second variable increases. What type of association is there between the two variables?

A. Positive association  
B. Negative association  
C. No association  
D. There is not enough information to tell

2. Which is a true statement about the scatter plot shown at the right?

A. The association is linear.  
B. The association is positive.  
C. The graph does not appear to have a trend.  
D. All the above are true.

3. The table below shows the number of chapters and pages in several books. Use the data in the table to create a scatter plot.

CHAPTERS	12	10	15	17
PAGES	320	218	375	360

4. Which is a true statement about the scatter plot shown at the right?

A. As the chapters in a book increase, the number of pages decreases.  
B. As the chapters in a book decrease, the number of pages increases.  
C. As the chapters in a book increase, the number of pages increases.  
D. Both B and C are true.

Unit: Scatter Plots and Data  
Review

Name \_\_\_\_\_  
Date \_\_\_\_\_ Pd \_\_\_\_\_

**SCATTER PLOTS AND DATA STUDY GUIDE**

Solve each of the problems below. Be sure to ask questions if you need more help with a topic.

**I CAN DESCRIBE PATTERNS OF ASSOCIATION FOR BIVARIATE DATA.**

1. Describe the type of association you'd expect to see between the following variables. Explain your choices.

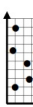
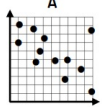
a. The length of a movie and the number of tickets sold  
b. The number of hours a musician practices and the number of songs written

2. George is looking at two sets of data and sees that as one set decreases, the other set also decreases. What type of association is this?

**I CAN INTERPRET AND DESCRIBE PATTERNS OF ASSOCIATION.**

4. For each scatter plot, label the type of association (linear or non-linear).

A



5. Which of the scatter plots could represent the number of food items and the total number of calories consumed in a meal? Explain.

EIGHTH GRADE CURRICULUM

**SCATTER PLOTS  
AND DATA**

UNIT ELEVEN: ANSWER KEY

©MANEUVERING THE MIDDLE, 2016

answer keys  
included

