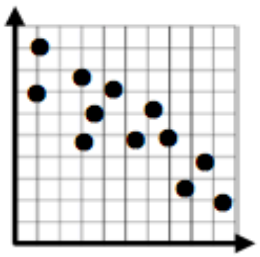
SCATTER PLOTS AND DATA STUDY GUIDE

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

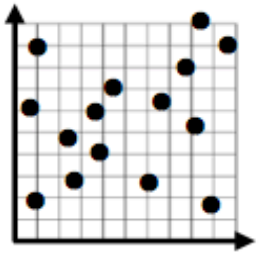
I CAN DESCRIBE PATTERNS OF ASSOCIATION FOR BIVARIATE DATA.	8.SP.1
1. What type of association would you expect to see between the length of a movie and the number of actors in the movie? Explain. None; the length of a movie does not affect the number of actors in a movie.	2. What type of association would you expect to see between the number of hours a musician spends practicing and the number of mistakes the musician makes in a performance? Explain. Negative; as the hours a musician practices increases, the mistakes made should decrease.
3. George is looking at two sets of numerical data and sees that as one set decreases the other set also decreases. What type of association is this? Positive; when variables move together the association is positive.	4. The first variable in a scatter plot is the square footage of a building. Give an example of a second variable that would result in a positive association. Answers will vary.

I CAN INTERPRET AND DESCRIBE PATTERNS IN SCATTER PLOTS. 8.SP.1

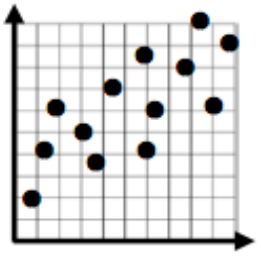
For each scatter plot, label the association (positive, negative or none) and whether it is linear or non-linear.

5. 

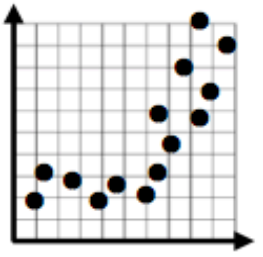
Negative
Linear

6. 

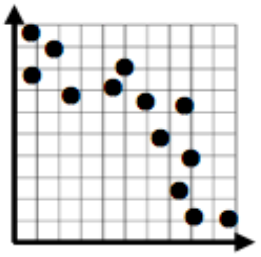
None
Non-linear

7. 

Positive
Linear

8. 

Positive
Non-linear

9. 

Negative
Non-linear

10. Which of the scatter plots could likely represent the number of food items ordered and the total number of calories consumed at a meal? Explain.

#7 and #8; both show positive association.

11. Compare the scatter plots in #5 and #7. Which has a stronger association? Explain.

#5 is a stronger association because the points of data are closer together.

I CAN CONSTRUCT AND INTERPRET SCATTER PLOTS. 8.SP.1

The scatter plot shows the number of steps a person walked and the number of hours of T.V. a person watched on a given day.

12. Does the data demonstrate positive, negative or no association, and what can we conclude from this?

Negative; as the hours that people watched TV increased, the number of steps walked decreased.

13. Is the scatter plot linear or non-linear?

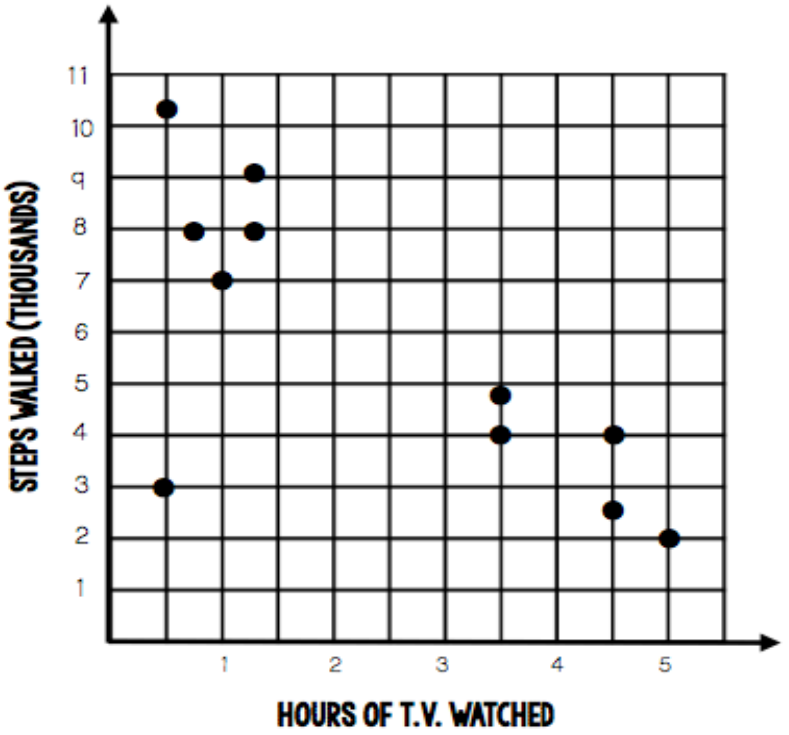
Linear

14. Are there any outliers in the data? Explain.

Yes; the point (0.5, 3,000) is much lower than the rest of the data.

15. Is there any clustering in the data? Explain.

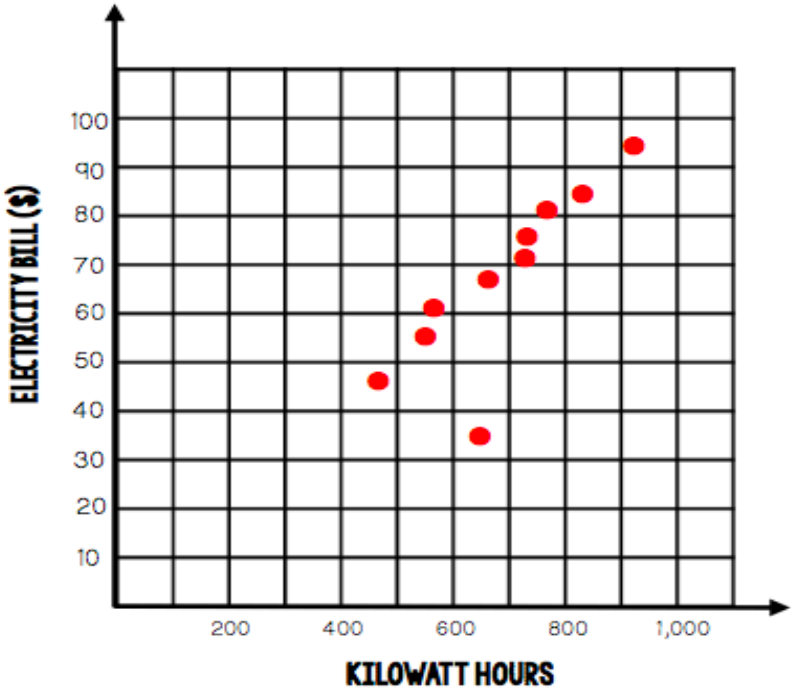
Yes; there seems to be two distinct groups of data.



I CAN CONSTRUCT AND INTERPRET SCATTER PLOTS. 8.SP.1

16. The table shows the number of kilowatt hours of energy homes used in a month and the cost of their electricity bill. Use the data to construct a scatter plot.

KWH (KILOWATT HOURS)	ELECTRICITY BILL
797	$80.77
550	$56.10
650	$35.22
830	$84.50
475	$48.02
705	$71.26
690	$68.75
595	$61.00
737	$76.18
910	$94.60



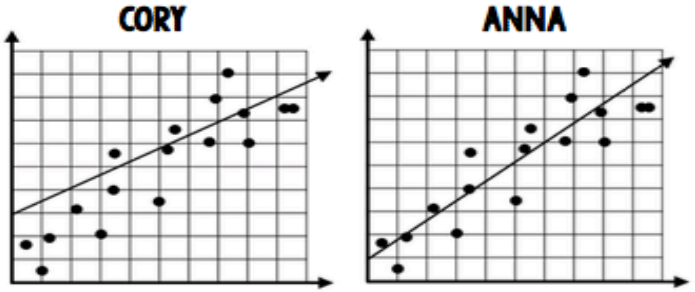
Describe any conclusions you can make from the scatter plot:

The positive association shows that as the kilowatt hours increase, the total cost of the electricity bill increases.

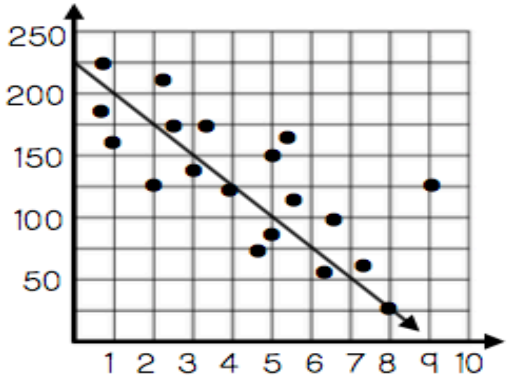
I CAN INFORMALLY FIT STRAIGHT LINES FOR SCATTER PLOTS WITH LINEAR ASSOCIATION. 8.SP.2

17. Cory and Anna drew trend lines on the scatter plot shown. Who drew a line that best fits the data? Explain.

Anna; the line she drew lies closest to the points of data and follows the trend of the data best. Cory's line starts too high on the y-axis, and the slope not does not follow the data.

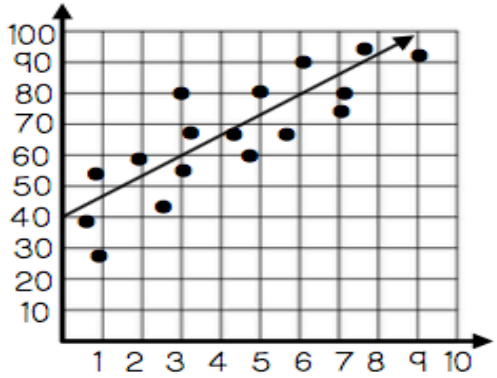


18. Write an equation for the trend line shown.



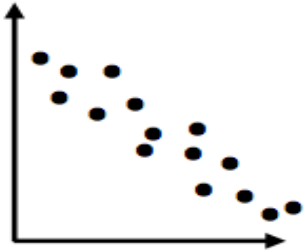
y = -25x + 225

19. Write an equation for the trend line shown.



y = 20/3x + 40

20. Which of the following could be the equation of a trend line for the scatter plot shown?



A. y = -3x – 6
B. y = -4x + 8
C. y = 2.5x + 7
D. y = x – 8

I CAN USE THE EQUATIONS OF LINEAR MODELS TO SOLVE PROBLEMS. 8.SP.3

Several schools reported the number of students who received a flu vaccine in a year and the number of cases of the flu amongst their students that year. A scatter plot was made with a trend line that had an equation of $y = -\frac{1}{4}x + 85$, where y is the total number of cases of the flu and x is the total number of students who received a flu vaccine. Use the data to answer the questions below.

21. Predict the number of cases of the flu that would occur if 300 students receive a flu vaccine.

10 cases

22. Predict how many students received a flu vaccine if a school had 65 cases of the flu.

80 students

23. What is the slope of the trend line equation, and what does it mean in the context of the situation?

The slope of -1/4 means that there is about 1 less case of the flu for every 4 students who receive a vaccine.

24. What is the y-intercept of the trend line equation, and what does it mean in the context of the situation?

The y-intercept of 85 means that we can predict if 0 students received a vaccine that there'd be 85 flu cases.

I CAN DISPLAY FREQUENCIES IN A TWO-WAY TABLE. 8.SP.4

25. Several high school students were surveyed and asked if they have a job and if they have their own car. The results are shown below.

JOB	N	N	Y	Y	Y	N	N	N	Y	N	N	Y	Y	N	N	N	Y
CAR	N	Y	Y	N	Y	N	N	Y	Y	N	Y	Y	Y	Y	Y	N	Y

Use the survey results to complete the two-way table at the right.

	CAR	NO CAR	TOTAL
JOB	6	1	7
NO JOB	5	5	10
TOTAL	11	6	17

a. Of the students surveyed, how many have a job? 7

b. Of the students who have a car, how many also have a job? 6

c. Of the students who do not have a car, how many have a job? 1

I CAN DISPLAY FREQUENCIES IN A TWO-WAY TABLE. 8.SP.4

26. The two-way table shows the results of a survey where middle school students were asked what their favorite core subject was. Fill in each blank space.

	MATH	SCIENCE	ENGLISH	HISTORY	TOTAL
6TH	42	39	55	48	184
7TH	51	60	52	37	200
8TH	64	52	41	43	200
TOTAL	157	151	148	128	584

List the most popular core subject in each grade:

6th: English

7th: Science

8th: Math

I CAN USE RELATIVE FREQUENCIES TO DESCRIBE ASSOCIATION. 8.SP.4

27. The two-way table shows results from a survey where individuals were asked if they prefer fruits or vegetables and if they have any cavities. Round relative frequencies to the nearest percent.

	FRUITS	VEGETABLES	TOTAL
CAVITIES	52	33	85
NO CAVITIES	18	40	58
TOTAL	70	73	143

a. What is the relative frequency of people who have cavities?

59%

b. Of the people who prefer fruit, what is the relative frequency of people who have cavities?

74%

c. Of the people who prefer vegetables, what is the relative frequency of people who have cavities?

45%

d. Based on the survey, does there seem to be any association between the two variables? Explain.

Yes; the survey results show that people who prefer fruits are more likely to have cavities than people who prefer vegetables.