

IS THERE A RELATIONSHIP BETWEEN EDUCATION AND INCOME

Correlation Essential Question:

How do we **show**, **describe** and **measure** the relationship between two variables?

Correlation Driving Questions:

Is there a relationship between *how educated people are* and *how much wealth* is in their community?

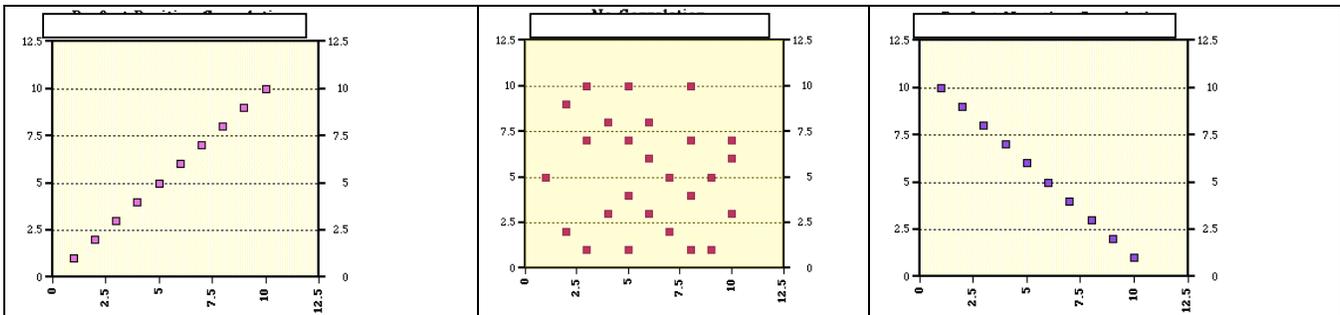
ACCESSING PRIOR KNOWLEDGE:

1) What is the American Dream? Write a 2-3 sentence explanation.

2) What are factors of the American Dream?

Hint: Obama talked about **Education** as one of the factors that influence the American Dream and **Personal Wealth** as one of the outcomes of the American Dream.

REMEMBERING OUR WORK WITH CORRELATION:



Circle Correct Answer:

- A) Positive Correlation
- B) Negative Correlation
- C) No Correlation

- A) Positive Correlation
- B) Negative Correlation
- C) No Correlation

- A) Positive Correlation
- B) Negative Correlation
- C) No Correlation

The below data from May 2007 is from the *Center for Community Research and Solutions* www.unitedwayla.org and is based upon Service Planning Areas (SPA) within the county of Los Angeles which is organized into the following 8 geographic areas

SPA 1 Antelope Valley	SPA 5 West
SPA 2 San Fernando Valley	SPA 6 South
SPA 3 San Gabriel Valley	SPA 7 East
SPA 4 Metro (Camino Nuevo HS)	SPA 8 South Bay

BEFORE WE BEGIN IT WILL BE IMPORTANT TO DISTINGUISH BETWEEN **CORRELATION** AND **CAUSATION**.

Definitions from www.wikipedia.com	
<p>Correlation: indicates the strength and direction of a <i>linear</i> relationship between two random variables.</p> <p>For this lab we are going to look at the strength and direction of the linear relationship between the two random variables of <i>education</i> and <i>income</i>.</p>	<p>Causation: "Correlation does not imply causation" is a phrase used in science and statistics to emphasize that <i>correlation</i> between two variables does not automatically imply that one causes the other (though it doesn't remove the fact that correlation can still be a hint, whether powerful or otherwise).</p> <p>For this lab we are going to establish if there is a relationship between one's education and one's household income.</p>
Thinking about the difference (answer the questions below)	
<p>1) How are correlation and causation different from each other?</p>	
<p>2) If our lab shows a relationship between <i>education</i> and <i>income</i> why is it that we cannot automatically say an education will cause you to have more money? What other factors / variables influence a person's income beyond an education? Identify at least three factors that influence a person's income beyond an education and explain how each factor affects a person's possible income.</p>	

COUNTY CORRELATION:

MEDIAN HOUSEHOLD INCOME FOR FAMILIES LIVING IN DESIGNATED REGION								
INCOME	SPA 1	SPA 2	SPA 3	SPA 4	SPA 5	SPA 6	SPA 7	SPA 8
The Average home income	\$49,104	\$58,238	\$54,388	\$32,715	\$84,696	\$29,676	\$46,357	\$54,610

PERCENTAGE OF INDIVIDUALS LIVING IN EACH REGION WITH A COLLEGE DEGREE								
INCOME	SPA 1	SPA 2	SPA 3	SPA 4	SPA 5	SPA 6	SPA 7	SPA 8
B.A. or greater	19.4%	28.4%	25.8%	23.9%	52%	7.7%	13.2%	27%

THINKING ABOUT THE ABOVE DATA TABLES:

DIRECTIONS: ANSWER THE FOLLOWING QUESTIONS

1) Choose any two of the SPA regions above to look at more closely.

The two SPA regions I am looking at are

A) SPA ____, the region of _____ which has an average home income of _____ with _____ percent of individuals with a college degree.

B) SPA ____, the region of _____ which has an average home income of _____ with _____ percent of individuals with a college degree.

2) What are three things you know about each of the above regions you have chosen.

A) SPA ____ the region of _____

-
-
-

B) SPA ____ the region of _____

-
-
-

Find a classmate who chose the same SPA regions and what three things did they know about the area?

-
-
-

-
-
-

DIRECTIONS: Use data from the previous page to make your graph

PART 1: Identifying Variables:

In our situation: (circle the correct underlined statement)

Does the education depend upon the income or does the Income depend upon the education?

How does your above answer relate to which variable (*education or income*) will be used for which axis (*x or y*)? _____

Independent variable (x): _____ Dependent variable (y): _____

PART 2: Labeling Axis and Determining Scale:

In our situation:

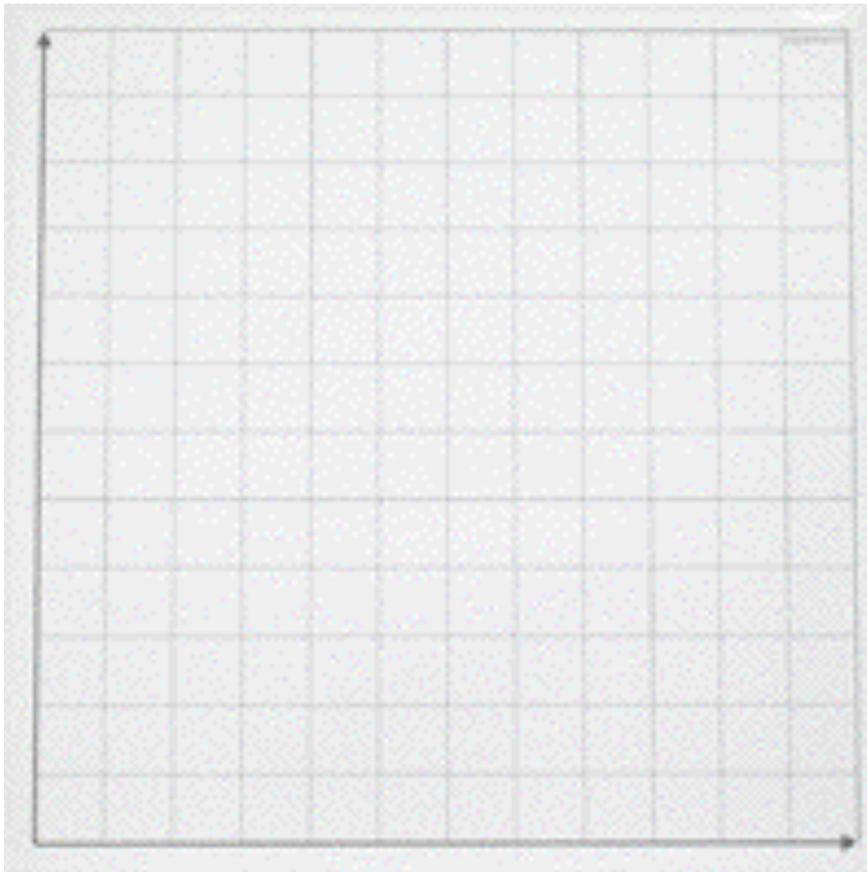
The range for the x-axis is: (smallest #) _____ to (biggest #) _____ : scale: _____

In our situation:

The range for the y-axis is: (smallest #) _____ to (biggest #) _____ : scale: _____

Graph Title: Is there a relationship between education and income?

Y-Axis Title: _____



X-Axis Title: _____

POINTS OF DATA

What are your ordered pairs?

	X - axis	Y - axis
SPA 1		
SPA 2		
SPA 3		
SPA 4		
SPA 5		
SPA 6		
SPA 7		
SPA 8		

DIRECTIONS: Answer the following questions

1) What type of correlation does your scatter plot show? check one

_____ negative correlation _____ no correlation _____ positive correlation

Explain your answer:

2) Think back to your answer for the question about what other factors / variables influence a person's income beyond an education. Choose one of the factors you identified and describe how you think that particular factor would impact the graph you just made.

3) What is the equation of your best fit line? Write your equation in $y = mx + b$ form.

STEP 1: FIND YOUR SLOPE

STEP 2: FIND YOUR Y-INTERCEPT

WHAT IS YOUR EQUATION:

4) As the amount of individual education increases what happens the amount of community wealth?

Circle the appropriate answer: decreases can't tell increases

5) State in your own words a relationship that may exist between individual income and community wealth.

6) What may be possible limitations to our research?