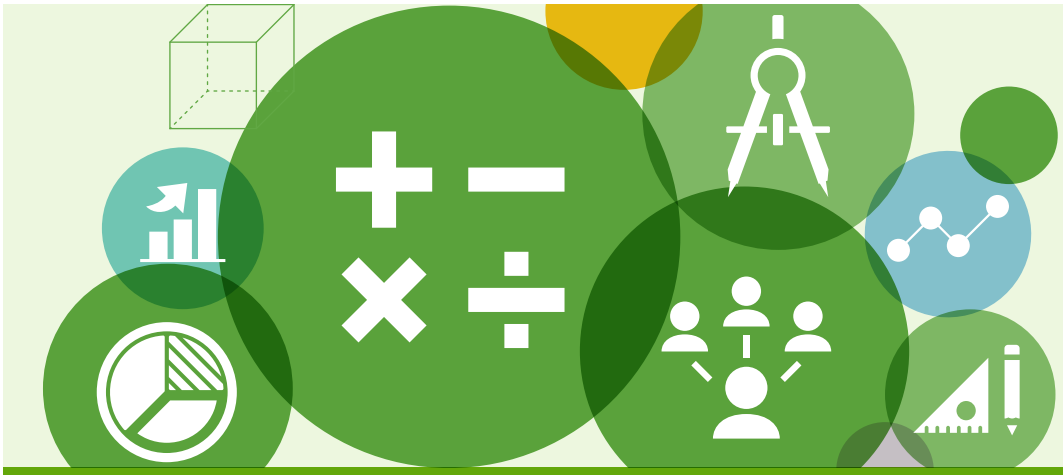


STUDENT VERSION

FITTING A LINE TO DATA – EARNINGS AND EDUCATIONAL ATTAINMENT

Activity Items

The following items are part of this activity and appear at the end of this student version.

- Item 1: Educational Attainment and Median Annual Income
- Item 2: Educational Attainment and Median Annual Income by Sex

Student Learning Objectives

- I will be able to create a scatter plot relating median annual income to years of education.
- I will be able to informally fit a line on a scatter plot, derive an approximate equation for that line, and determine how well the line fits the data.

NAME:_____ DATE:_____

What do you want to be when you grow up? How much money do you think you will make? How many years of education will you need for this career? These are important questions to ask yourself as you get older — surely you've heard them before from teachers or guardians. In this activity, you will explore data that could help you answer them.

The U.S. Census Bureau conducts a survey every month called the American Community Survey to collect data from a sample of the American population on things like income and education. **Item 1: Educational Attainment and Median Annual Income** shows the results from 2019 for workers 25 years and older.

Part 1

1. What patterns do you see in the data in **Item 1**?

2. Create a scatter plot of these data on the graph template below, plotting the points as accurately as you can. Be sure to title your plot and label your axes.



3. Describe what you see in your scatter plot, keeping these questions in mind: Is the association positive, negative, or nonexistent? Do there appear to be any outliers or clusters of data? Are there any confounding variables that could be affecting the association?

4. Next, use a ruler to draw a line on your scatter plot that best fits the data, extending it all the way to the vertical axis. This line should follow the general path and slope of your data points, with about the same number of points above and below it.

5. Find a linear equation for your line.

   a. Locate the approximate y-intercept: _____

   b. Find the slope between any two points on your line (which may not necessarily be points from the original data!), rounding to the nearest thousand: Show your work below.

   c. Write the equation for the line in slope-intercept form (using the rounded slope):

6. Is your y-intercept positive or negative? What does its value show in terms of earnings and educational attainment, and is that value useful to know in this case?

7. What does the slope tell us about earnings and educational attainment, and is that finding useful?

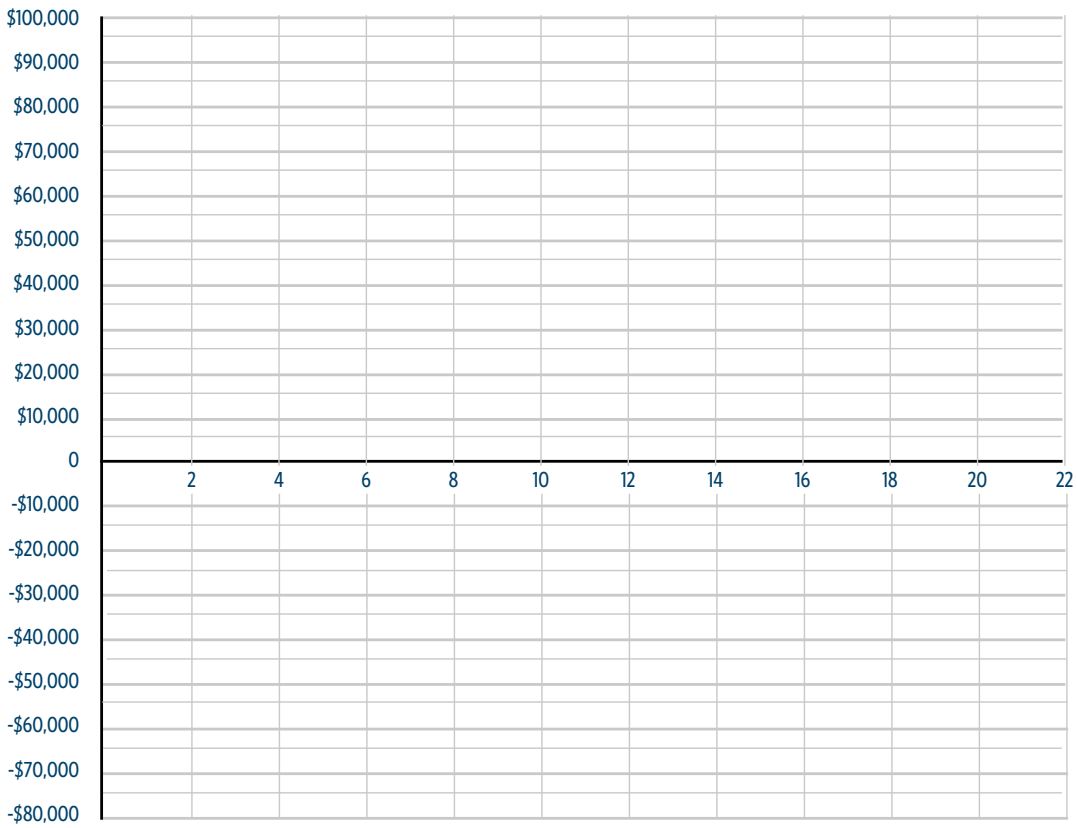
8. How well does your line fit the data? (Determine whether most or all of your points fall on, or are close to, the line.)

9. Turn to your classmates and compare your lines and equations. Do some of your classmates' lines seem to better fit the data? Explain.

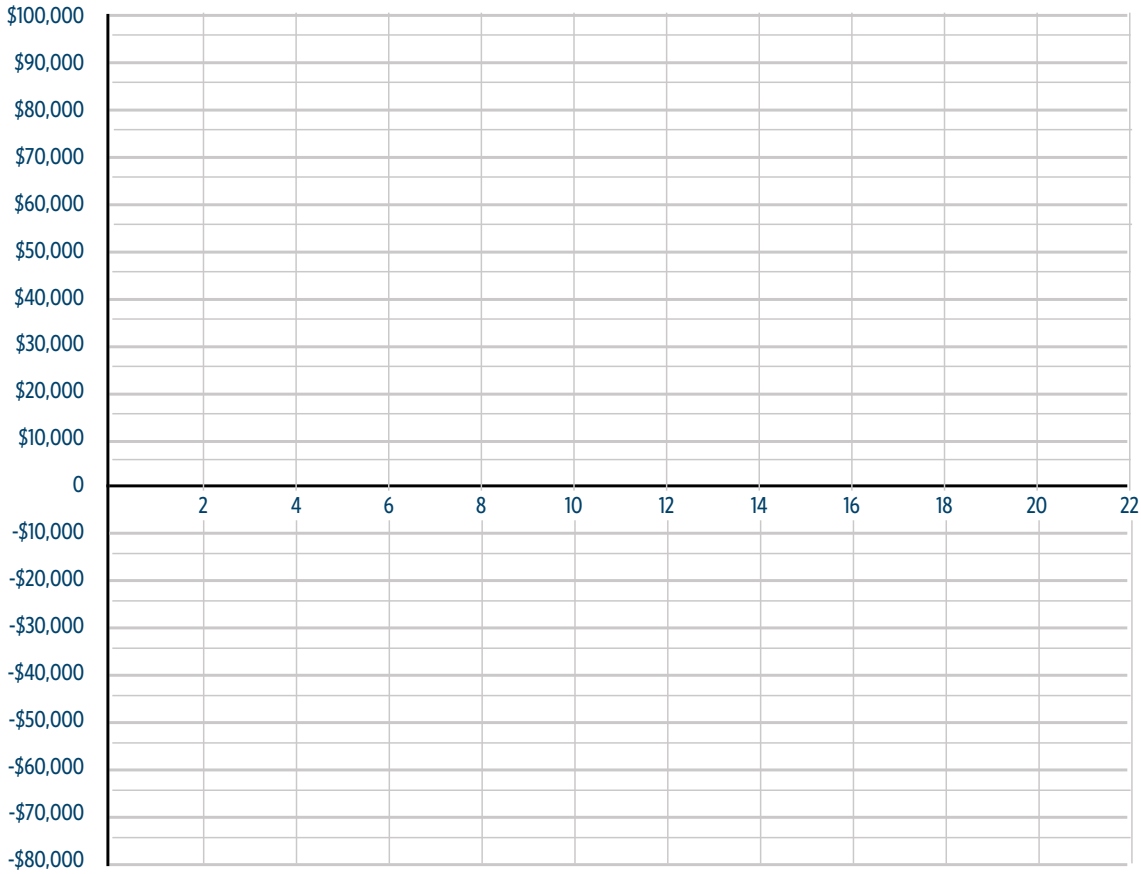
Part 2

Now we will look at the educational attainment and median income data for men and for women.

Use the data in **Item 2: Educational Attainment and Median Annual Income by Sex** to create two scatter plots with lines of best fit — one for men and one for women (following the same process you used in part 1 to plot your points, draw your line, and determine your equation). Round all numbers to the nearest whole number.



For men: y = _____


$100,000
$90,000
$80,000
$70,000
$60,000
$50,000
$40,000
$30,000
$20,000
$10,000
0
-$10,000
-$20,000
-$30,000
-$40,000
-$50,000
-$60,000
-$70,000
-$80,000
2
4
6
8
10
12
14
16
18
20
22

For women: $y =$ _____

1. Which sex appears to have a higher rate of increase in earnings per year of education? How do you know?

2. How does the slope of the line for men compare with the slope of the line from part 1?

3. How does the slope of the line for women compare with the slope of the line from part 1?

Part 3

Write a one-paragraph summary, with a title, to describe what you learned about the relationship between earnings and educational attainment through creating your scatter plots, finding your lines of best fit, and determining their equations.

Item 1: Educational Attainment and Median Annual Income

Educational Attainment	Approximate Years of Education	Median Annual Income
Less than high school graduate	10	$25,876
High school graduate or equivalent	12	$31,956
Some college or associate degree	14	$38,125
Bachelor's degree	16	$56,344
Graduate or professional degree	18	$75,495

data.census.gov/cedsci/table?q=B20004%3A%20MEDIAN%20EARNINGS%20IN%20THE%20PAST%2012%20MONTHS%20%28IN%202019%20INFLATION-ADJUSTED%20DOLLARS%29%20BY%20SEX%20BY%20EDUCATIONAL%20ATTAINMENT%20FOR%20THE%20POPULATION%2025%20YEARS%20AND%20OVER&tid=ACSDT1Y2019.B20004

Copy and paste the link above into your browser to view the source data.

Item 2: Educational Attainment and Median Annual Income by Sex

Men:		
Educational Attainment	**Approximate Years of Education**	**Median Annual Income**
Less than high school graduate	10	$30,725
High school graduate or equivalent	12	$38,906
Some college or associate degree	14	$46,610
Bachelor's degree	16	$69,201
Graduate or professional degree	18	$93,998

Women:		
Educational Attainment	**Approximate Years of Education**	**Median Annual Income**
Less than high school graduate	10	$20,046
High school graduate or equivalent	12	$25,829
Some college or associate degree	14	$31,644
Bachelor's degree	16	$47,895
Graduate or professional degree	18	$63,912

data.census.gov/cedsci/table?q=B20004%3A%20MEDIAN%20EARNINGS%20IN%20THE%20PAST%2012%20MONTHS%20%28IN%202019%20INFLATION-ADJUSTED%20DOLLARS%29%20BY%20SEX%20BY%20EDUCATIONAL%20ATTAINMENT%20FOR%20THE%20POPULATION%2025%20YEARS%20AND%20OVER&tid=ACSDT1Y2019.B20004

Copy and paste the link above into your browser to view the source data.