



Investigation 3.

In this investigation, you will implement the statistical investigation process to answer the question: is there an association between sleep and social media usage.

Step 1: Identify the problem and pose a statistical question

Is there an association between time spent on social media and sleep?

Step 2: Collect or obtain data

Survey 20 people and ask the following questions:

- How many hours sleep do you normally get per night on a weeknight?
- How many hours per week do you spend on social media?

Record your results in the table below:

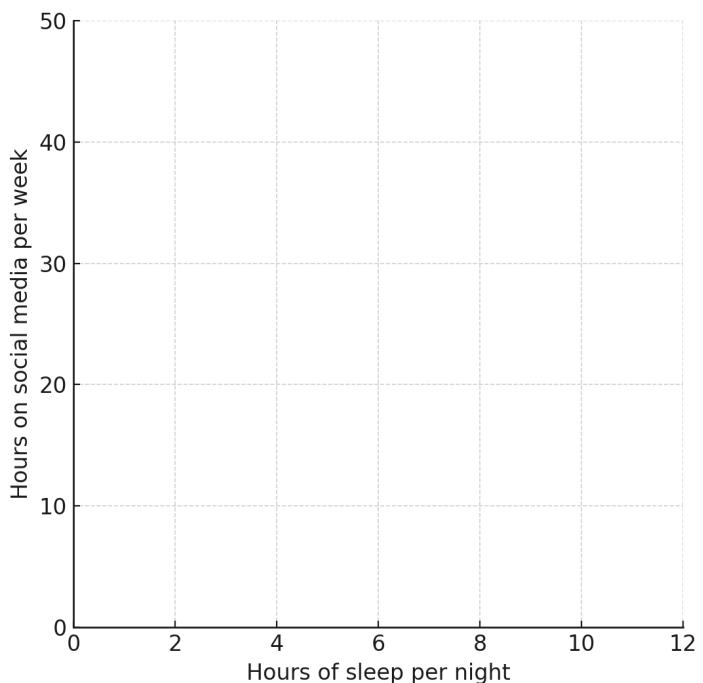
Person #	Social media	Sleep
1		
2		
3		
4		
5		
6		
7		

Person #	Social media	Sleep
8		
9		
10		
11		
12		
13		
14		

Person #	Social media	Sleep
15		
16		
17		
18		
19		
20		

Step 3: Organise and analyse the data

- Plot your data on the scatterplot.
- Put a line of best fit on your graph.
- Use two points from the line of best fit to find the equation of the line by hand.





Investigation 3 (continued).

- d. Describe the association in terms of direction, strength, and form.
- e. Use your CAS calculator and the raw data (from step 2) to find the equation of the least squares line, correlation coefficient (r), and coefficient of determination (r^2).
- f. Interpret the gradient and Y intercept in context.
- g. Interpret the coefficient of determination (r^2) found on your calculator.
*What percentage of the variation in social media use is explained by sleep hours?
What might explain the rest?*
- h. Comment on interpolation vs extrapolation in the context of this data.



Investigation 3 (continued).

Step 4: Interpret the results

Use the evidence from step 2 and 3 to comment on your findings.



Investigation 3 (continued).

Step 5: Communicate the findings

Write a concise clear summary of your findings, summarising the investigation for someone who didn't read it. You should include:

- What the investigation was trying to figure out.
- A description of the data and association
- The equation of your line of best fit and what the gradient and intercept mean
- Your conclusions about strength, reliability, and limitations of the model
- A statement about causation