



THE 2023 YOUNG MATHEMATICAL STORY AUTHOR (YMSA) COMPETITION

**THE CINDY NEUSCHWANDER AWARD
(THE 12-15 YEARS OLD CATEGORY)**

SHORTLISTED

'How to Win an Argument Using a Scatter Diagram'
by Jeem Naseer (13 years old) at Sharafuddin School (Maldives)

You can read the author's inspiration for the story and the judges' comments
on:

www.mathsthroughstories.org/ymsa2023

#YMSAMaths

HOW
TO

WIN



AN

ARGUMENT

USING A

SCATTER
DIAGRAM



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It was a quiet afternoon in the middle of July. Aana was taking a break from studying when she came across Layan, lying on the sofa scrolling through social media on his tablet.

'Layan... You shouldn't be on the internet so much. It will affect your grades, specially this close to the term tests.' Aana said.

'Screen time doesn't affect our grades. It's something teachers made up or something like that,' Layan said, continuing to scroll through some people pouring soda in a tub, trying to ignore her.

'Well it affected my grades,' said Aana.

'It must be just you then.'

'it's not! And I will prove it.'

'Go ahead then, I'd like to see you try.' And with that, Layan left, eyes still glued on the tablet screen.

Aana resolved to show him that screen time did, in fact affect grades. 'But how? Oh! I know...'. She mumbled to herself as the perfect idea came to her.

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The next day in school, Aana came ready to execute her plan, with a pen in one hand and a notepad in the other.



Her friends, Aimal and Zaahil approached her. 'Hey Aana! Why do you have a note pad and pen out right now? Classes haven't even started yet.' Aimal Asked.

'Are you trying out for journalist club? Asked Zaahil.

'No... there is no journalist club, Zaahil. I'm just looking into whether screen time affects our grades and I'm going to be interviewing you guys to get the data for my investigation.' Aana explained.

'that seems interesting. 'Aimal said.

'yeah! So how long do you spend on screens?'

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A hand-drawn table in a spiral notebook. The title is 'DATA'. The first column is labeled 'Hrs of screen time daily' and the second column is labeled 'Average grade (%)'. The data points are as follows:

Hrs of screen time daily	Average grade (%)
2	85
3	70
4	81
2.5	96
1	69
7	80
9.5	82 24
4.5	78
9	22
6	46
6	31
10	84
2	80
3.5	70
6	64
7	

By the end of the day, Aana had collected data from 25 students. 'This should be enough to show the correlation,' thought Aana.

She had recorded the data sets in a table.

As she looked at the table, she couldn't spot any obvious correlation between screen time and average grades. There was no order, and it was all very confusing. Layan would not understand it, at all.

'I need a way to convey this information visually, so Layan can understand it better. But how?' Aana thought to herself. She decided to ask her math teacher, Shamina miss for help.

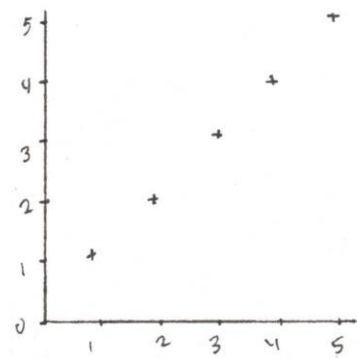


Aana went to the Math Department, and asked her teacher this question.

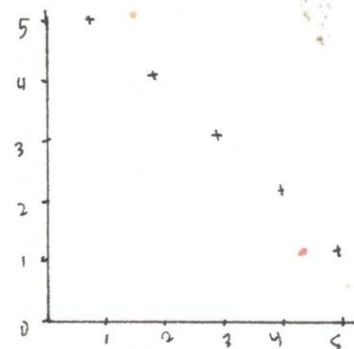
'I have the perfect solution for you! Shamina miss said, opening her laptop. 'This is a scatter diagram.' She showed Aana a diagram.

'This is very simple. You graph a set of data points along each axis, to look for a relationship between the data sets. 'Miss pointed at the diagram, where points fell along a line. 'See this? This shows that the variables are correlated. Variables can be positively or negatively correlated. If the values on both data sets increases, it is positive. If one variable decreases as the other increases, it is negatively correlated.'

Example of Positive correlation



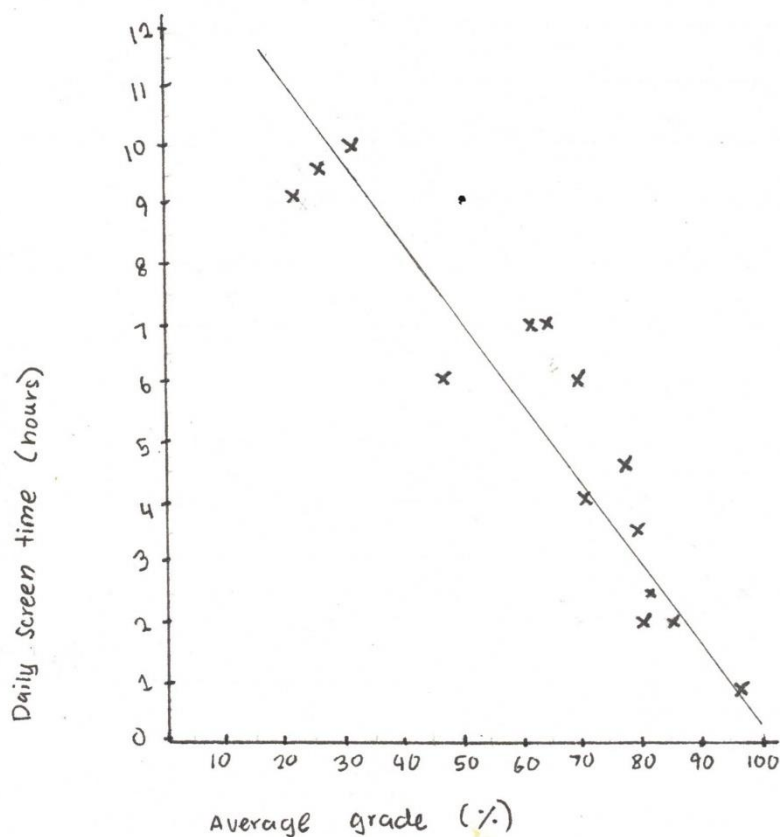
Example of Negative correlation



'Hope this helped! Shamina miss said.

Aana thanked her and left to make a scatter diagram of her own.

'Hmm... if I keep the 'hours of screen time on the y axis, and 'average grade' on the X-axis, when I plot the points....it shows me the correlation of these two variables! 'Aana said to herself as she drew her diagram.



As she observed the graph, she noticed that the students who had high grades usually had less screen time, and vice versa, which is a negative correlation.

'Ah! When Layan sees this, he can't deny that screen time does affect our average grades! 'Aana declared. "I have proven my point!"

The next day, Aana showed her scatter diagram to Layan. He was surprised that she'd proven that he was wrong.

'You were right, I guess...'he said sheepishly.

'So, you will minimize screen time, to get better grades?'

'I'll consider it!

'that's fine with me!



The End