This project was evaluated using the point scale of 0-1-2-3. The project was evaluated based on the visible information in the project photograph; some more information may have been on the additional sheets.

A. Title
Title: The Effect of the Hurricane's Origin on the Saffir-Simpson Scale Rating
Score: 3 – *The title correctly states the independent variable and the dependent variable and is NOT worded as a QUESTION.*
Comments: The title states both the independent variable (hurricane's origin) and the dependent variable (Saffir-Simpson scale rating).

B. Question
Question: How does the origin of the hurricane affect the Saffir-Simpson scale rating?
Score: 3 – *The question states the independent variable and the dependent variable, and is testable.*
Comments: The question correctly states the independent variable and the dependent variable. In addition, the dependent variable is measurable.

C. Hypothesis
Hypothesis: If a hurricane's origin is close to the equator, then the Saffir Simpson scale rating will be greater than the hurricanes that happened further away from the equator, because when it forms near the equator over warm ocean water in the Pacific Ocean area, there will be more amount of hurricanes that are really powerful.
Score: 2 – *The hypothesis (1) predicts the effect that changing the independent variable will have on the dependent variable, AND (2) explains the reason for the prediction using scientific concepts ("because…") but is incomplete or weak.*
Comments: The only science concept is that water is warmer near the equator, but they don't clearly say why it makes a hurricane more powerful. It is mentioned in the background research.

D. Background Research (found throughout the project especially within the hypothesis and discussion/conclusion sections)
Score: 2 – *Background research contains inaccurate or SOME relevant, well-chosen facts, definitions, concrete details, quotations, scientific concepts, or other information and examples that (1) provide information on the IV & DV OR (2) attempts to support the "because" portion of the hypothesis OR (3) attempts to support the "scientific reasoning" of the discussion/conclusion.*
Comments: The information provided directly connects to the investigation and the discussion section, but would be improved by specifically stating why warmer water is expected at lower latitudes. Either a scientific concept or empirical observation (data) that shows this to be true could be specified.

E. Investigation Design (ID)
Score: 2 – *Four of the 5 components of the ID are stated correctly, OR more than one IV is changing at a time or there are not multiple trials.*
Comments: The project correctly identifies and presents the IV, DV, levels of IV, and number of trials. The Constant variable are listed as "Not applicable," however additional constants that could apply are the general location the data was taken from (Pacific Ocean by Mexico).

F. Procedure
Score: 2 – *The Procedure accurately and completely satisfies two or three of the above. (The procedure*

is (1) a step-by-step description of how the investigation was done AND (2) uses precise language and scientific vocabulary to describe both the sequence of actions taken and materials used AND (3) is sufficiently detailed to enable the reader to replicate the investigation AND (4) is consistent with the Investigation Design Diagram (IDD) and is an appropriate test of the hypothesis.)
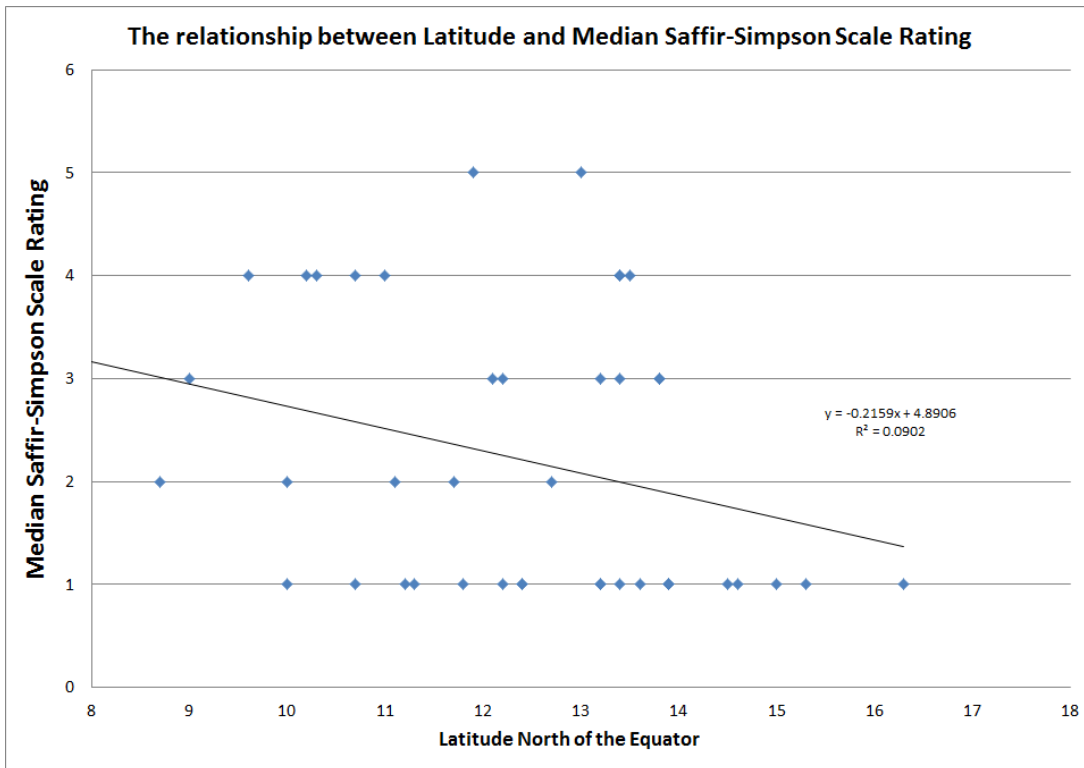**Comments:** The procedure outlines steps that aren't displayed on the board or a clear match to the data analysis presented. The data table uses the term median but the term median isn't used in the procedure section.

G. Data/Results
Score: 3 – *Data table(s) and graph(s) (1) are accurate and include labels (titles, axes with units of measure) AND (2) address the hypothesis and have been chosen to clearly address the original question AND (3) data analysis identifies and accurately summarizes trends or patterns in the data.*
Comments: The written data analysis section includes a mention of all the points from the data analysis and provides a summary of trends or patterns. Other suggestions for improvements, that didn't affect the score, are:
1) Clarify how the "intercept" was calculated and what it means.
2) Is there a slope that was calculated with the intercept, and what doe s it mean?
3) The average latitude was calculated, explain how it fits in with the data analysis and question.
4) Median is a measure of central tendency, why was this used in place of others (mode, or mean).
5) How might you describe the variability of the data and how it could be factored into the data analysis
6) All of the data graphed could also be graphed as a scatter plot (which includes the intercept and slope). The slope of the line would indicate decreasing intensity with higher latitudes but also show that higher latitudes can have storms stronger than some at lower latitudes, but overall stronger storms are more likely at lower latitudes.

The relationship between Latitude and Median Saffir-Simpson Scale Rating

$y = -0.2159x + 4.8906$
$R^2 = 0.0902$

Median Saffir-Simpson Scale Rating (y-axis)
Latitude North of the Equator (x-axis)

Ha. Discussion/Conclusion: Scientific Explanation
Score: 1 – *Three or four parts of the Scientific Explanation are complete and accurate.*
Comments: The claim could be improved with the added scientific reasoning of why water is warmer at the equator.

Hb. Discussion/Conclusion: Reflection
Score: 3 – *A scientific explanation consisting of a statement that (1) makes an overall claim addressing the original investigation question AND (2) supports the claim with evidence and relevant, accurate data from the investigation AND (3) contains relevant scientific concepts with reasoning AND (4) uses words, phrases and clauses that clarify and connect the relationships between claim, evidence and reasoning AND (5) demonstrates an understanding of the topic.*
Comments: The students successfully identified some sources of error. An additional source worth mentioning is the number of samples (hurricanes) used. More years of data would include more hurricanes. Tropical storms can be intense, but don't have a Saffir-Simpson index score. Including some tropical storms might show that these lower power storms are more likely to occur at higher latitudes as well, strengthening the conclusion.

I. Literature Cited
Score: 2- *Most parts of the Literature Cited are complete and accurate. Bibliography is present but references are not cited in the text of the investigation.*
Comments: There are no citations throughout the project. Including in text citations in the background research, hypothesis and discussion would bring the score for this section up to a "3."

Project Section	Score (0-3)	Weight	Weighted Score
A. Title	3	x 1	= 3
B. Question	3	x 1	= 3
C. Hypothesis	2	x 2	= 4
D. Background Research	2	x 2	= 4
E. Investigation Design (ID)	2	x 2	= 4
F. Procedure	2	x 2	= 4
G. Data/Results	3	x 3	= 9
Ha. Discussion/Conclusion: Scientific Explanation	1	x 2	= 2
Hb. Discussion/Conclusion: Reflections	3	x 1	= 3
I. Literature Cited	2	x 2	= 4
		Total weighted score	= 40 (54 max)
	Final Score (%) =	=Total weighted score/54 x 100	= 74 %