Student Data Sheet: Scatterplots: The Challenger Disaster

On January 28, 1986 the space shuttle Challenger exploded. Seven astronauts died because two large rubber O-rings leaked during takeoff. These rings had lost their resiliency because of the low temperature at the time of the flight. The air temperature was about 0° Celsius, and the temperature of the O-rings about 6 degrees below that.

The link between O-ring damage and ambient temperature had been established prior to the flight. The engineers at Morton Thiokol, Inc had recommended that the flight be delayed. Unfortunately their argument wasn't persuasive enough, and the launch proceeded with disastrous consequences.

The engineers had failed to display the link between ambient temperature and O-ring damage in a clear and unambiguous fashion. What was needed was a simple scatterplot. The data are given below. Draw a scatterplot from the data. Based on this graphic, what recommendation would you have made for a flight if the forecast was for below 0° Celsius?

Data from Previous Flights	
Temperature (^{0}C)	Damage Index
12	11
14	4
14	4
17	2
19	0
19	0
19	0
19	0
19	0
20	0
21	4
21	0
21	4
21	0
21	0
22	0
23	0
24	4

24	0
24	0
26	0
26	0
27	0

From the Exploring Data website- http://curriculum.qed.qld.gov.au/kla/eda/ adapted from: Tufte, E.R., *Visual Explanations*, p.39 ff.