

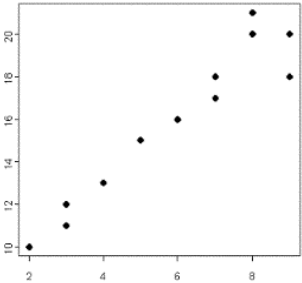
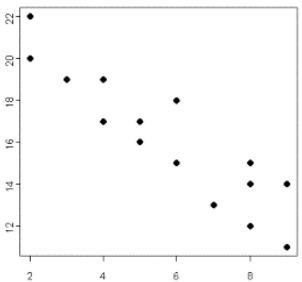
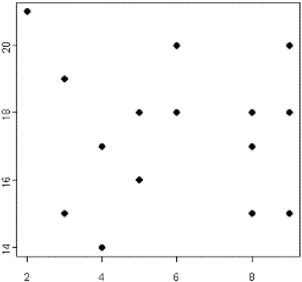
Name \_\_\_\_\_

# Scatterplots

The scatterplot gives us a visual means of seeing relationships between two variables.

We call a relationship *positive* if an increase in one variable corresponds to an increase in the other – plot shows a shape going UP the graph,

When one variable increases and the other decreases, we call the relationship *negative* – the plot shows a shape going DOWN the graph.

	<p>The plots are going up the graph, showing us that when one variable increases, the other does also.</p>
	<p>The plots are going down the graph, showing us that as one variable on the Y-axis increases, the variable on the axis decreases.</p>
	<p>The plots are scattered all over the graph, showing us that there is no obvious pattern or relationship between the two variables.</p>

## **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 is given on the next page.

### **What to do:**

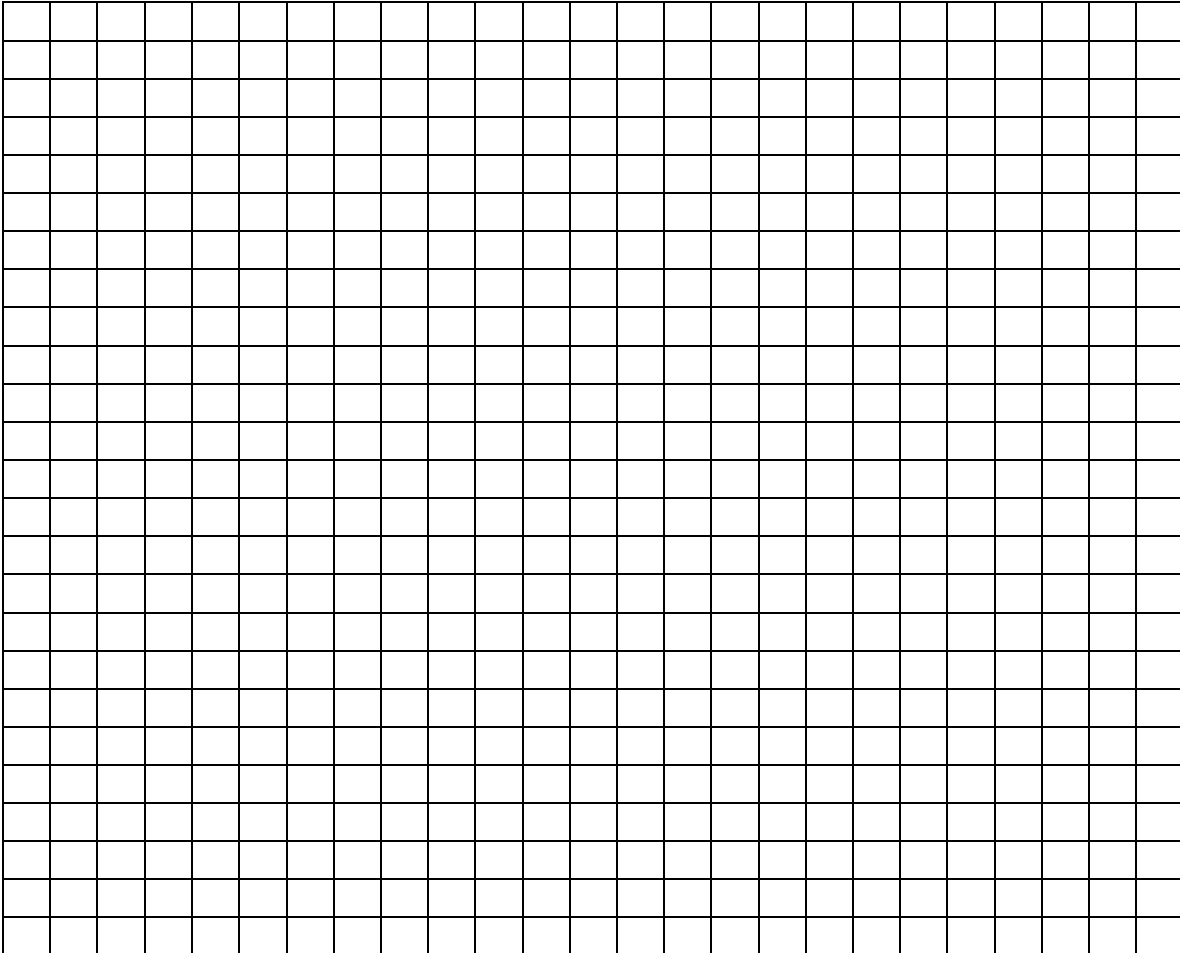
1. Answer this question:
  - a. What are the two variables being considered?
    - i. \_\_\_\_\_
    - ii. \_\_\_\_\_
  
2. Draw a scatterplot from the data on the next page.
3. Analyze the scatterplot. What relationship do you see? Is it a positive or negative relationship?  
  
\_\_\_\_\_
  
4. Based on this graphic, what recommendation would you have made for a flight if the forecast was for below 0 °Celsius? Write a brief paragraph explaining your answer.

<b>Data from Previous Flights</b>	
Temperature (°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

Adapted from: Tufte, E.R., [Visual Explanations](#), p.39 ff.

[http://exploringdata.cqu.edu.au/ws\\_scatr.htm](http://exploringdata.cqu.edu.au/ws_scatr.htm)

Draw your scatterplot here:



Write your paragraph here:

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