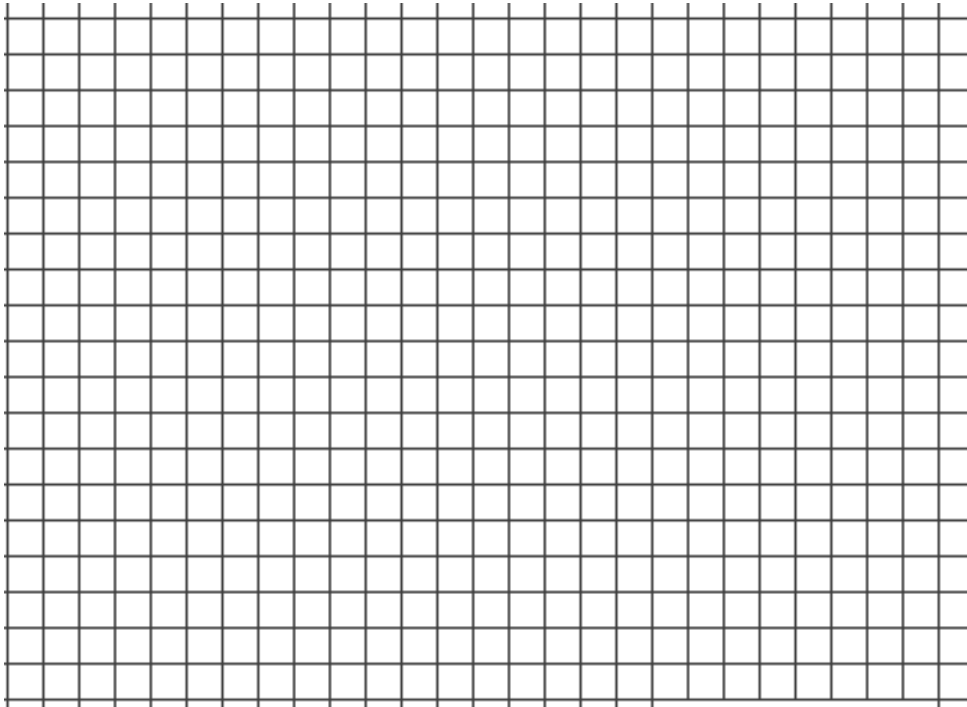




Graph *height vs. wingspan* as a scatter plot. Remember to label each axis with a title and scale.



Compare your graphs with other people. Are your graphs similar? Why?

Do these two variables have a relationship? If so, what is it?

Give at least one reason why this relationship might not be true.

### Scatter Plots

Scatter plots represent two-variable data as \_\_\_\_\_. Scatter plots can reveal a \_\_\_\_\_ between the two variables.

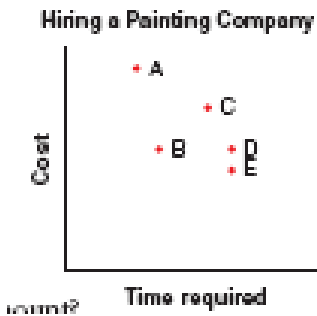
These relationships usually involve an \_\_\_\_\_ variable and a \_\_\_\_\_ variable.

For example, the result of a memory test usually depends on the length of time spent studying the objects.

The dependent variable is plotted on the \_\_\_\_\_ axis and the independent variable is plotted on the \_\_\_\_\_ axis.



### Interpreting Scatter Plots



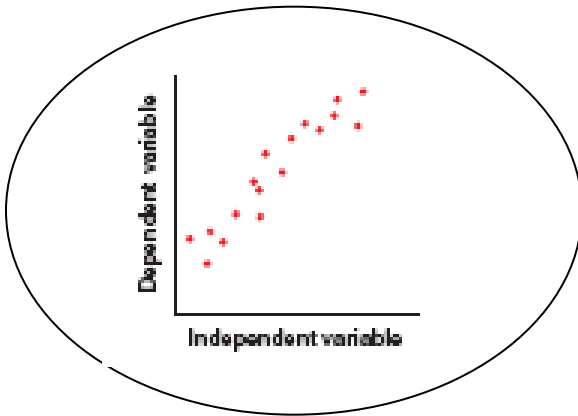
Jesse went to five different companies to get estimates for the cost and length of time to paint his house.

- a) What is the dependent variable? \_\_\_\_\_ Why?  
\_\_\_\_\_
- b) Which company will take the longest? \_\_\_\_\_
- c) Which company will cost the least? \_\_\_\_\_
- d) Which companies will cost the same? \_\_\_\_\_ & \_\_\_\_\_
- e) Why might you choose company B?  
\_\_\_\_\_
- f) Why might you choose company E?  
\_\_\_\_\_

## Correlation

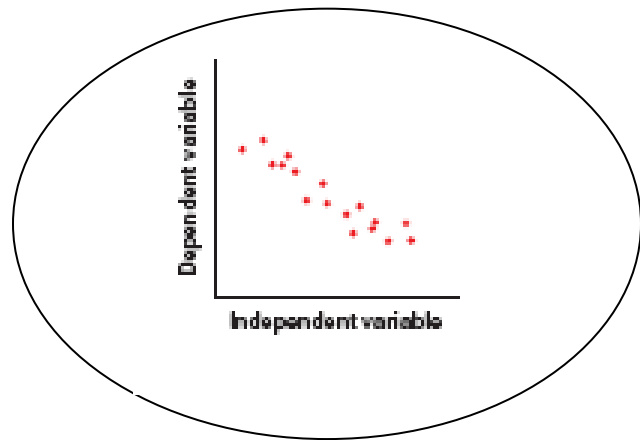
**Positive Correlation:** is a relationship between variables where the dependent variable increases as the independent variable increases. In other words, the variables increase together.

**Negative Correlation:** is a relationship between variables where one of the variables increases while the other decreases.



Example: the relationship between height and weight.

Example: the relationship between temperature and amount of clothing worn.



## Cause and Effect

Just because there appears to be a relationship in a graph does not prove that the independent variable causes the change in the dependent variable.

Think about the cause and effect of relationships, and ask yourself:

- Does this make sense? Are the two variables related?
- Could there be other variables influencing the independent variable?
- Is this relationship just a coincidence?

*Example:* State whether these relationships are reasonable or unreasonable. Give one reason for your answer.

**a)** A scientific study showed a negative correlation between aerobic exercise and blood pressure. It claimed that the increase in aerobic activity was the cause of the decrease in blood pressure.

*Reasonable/Unreasonable*      *Why?* \_\_\_\_\_

**b)** Mila discovered a positive correlation between gasoline price and average monthly temperature. She concluded that temperature determines the price of gasoline.

*Reasonable/Unreasonable*      *Why?* \_\_\_\_\_