

# Using Scatter Plots to Identify Relationships

## Learning Goals

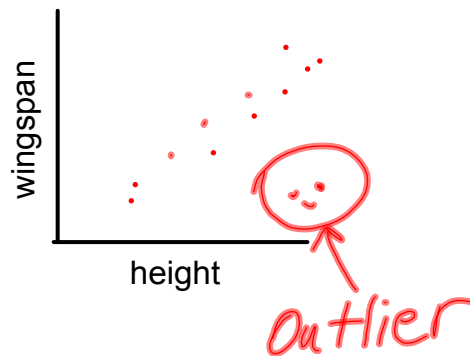
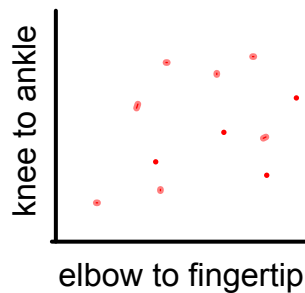
- collect data
- organize data
- make graphs to show data
- look at relationships of the data displayed

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## Collect data on length of

- elbow to fingertip
- knee to ankle
- height
- wingspan

## Make a scatter plot



## Answer the questions

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## Using Scatter Plots to Identify Relationships

Scatter plots represent two-variable data as a graph.  
 Scatter plots can reveal a relationship between two variables.

These relationships usually involve an independent variable and a dependent variable.

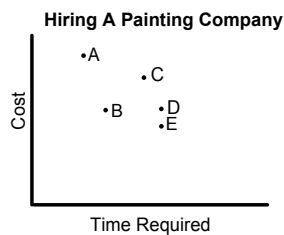
For example, the result of a memory test usually depends on the length of time spent studying the objects.

The dependent variable is plotted on the y axis and the independent variable is plotted on the x.



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## Interpreting Scatter Plots



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

- a) What is the dependent variable? Cost  
 Why? Depends on the time spent
- b) Which company will take the longest? D + E
- c) Which company will cost the least? E
- d) Which companies will cost the same? B & D
- e) Why might you choose Company B? fast and cheap
- f) Why might you choose Company E? cheapest

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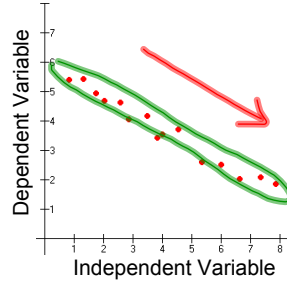
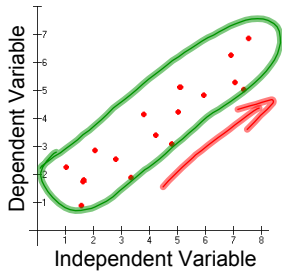
# Correlation

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

Example: Relationship between height and weight

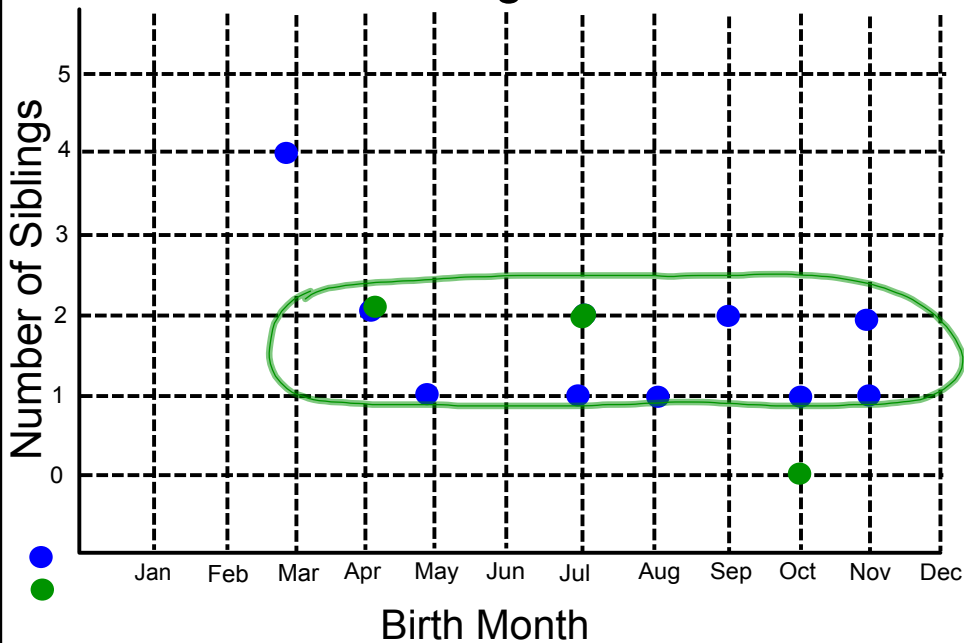
**Negative Correlation:** A relationship between variables where one variable increases while the other decreases.

Example: Relationship between temperature and the amount of clothing worn



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## Number of Siblings vs. Birth Month



No relationship

(drag the blue & green dots to graph the data for each class period)

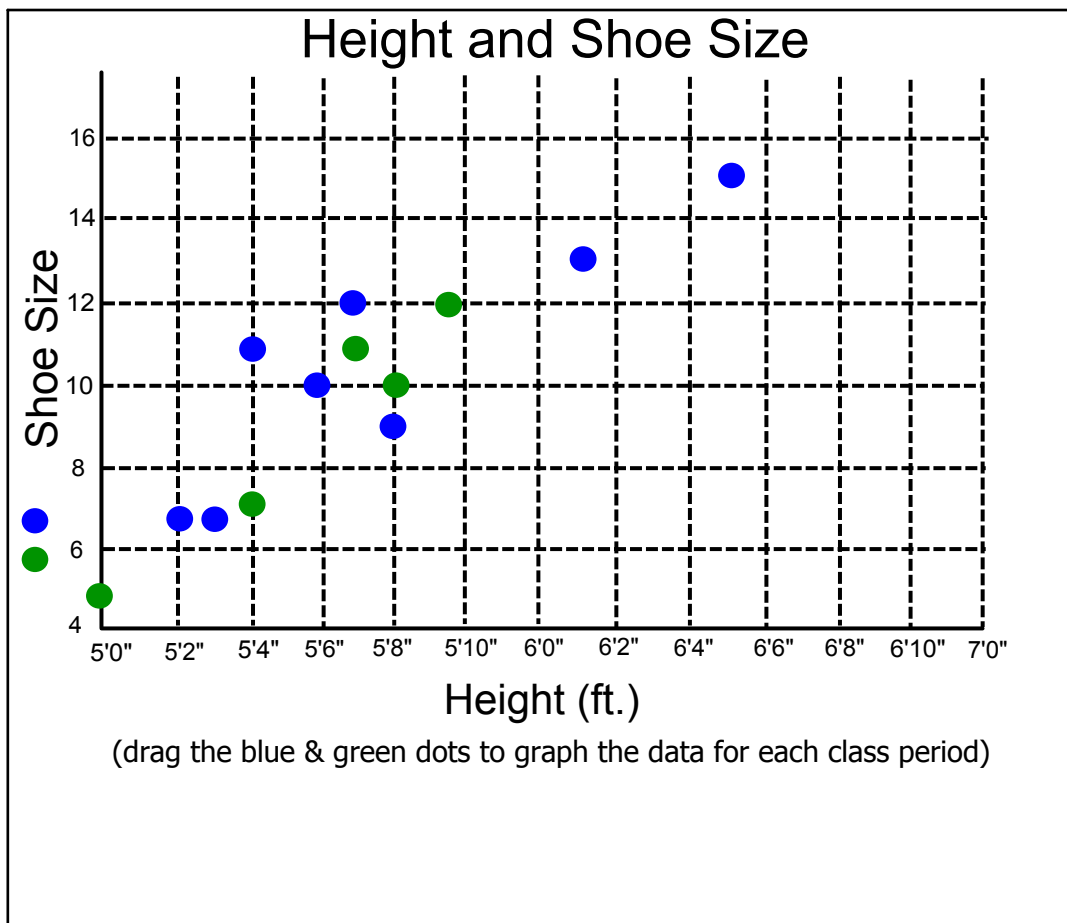
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# NO CORRELATION

**\* THE NUMBER OF SIBLINGS AND THE MONTH THAT YOU WERE BORN IN ARE NOT RELATED.**

**\* THERE IS NO PATTERN**

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## **POSITIVE CORRELATION**

**\* TYPICALLY, THE TALLER A PERSON IS, THE BIGGER SHOE SIZE THAT PERSON WILL WEAR.**

**\* THERE IS A PATTERN.  
Y INCREASES AS X INCREASES.**

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**Can you think of any situations that model no correlation, positive correlation or negative correlation?**

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## 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? exercise is good for you

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

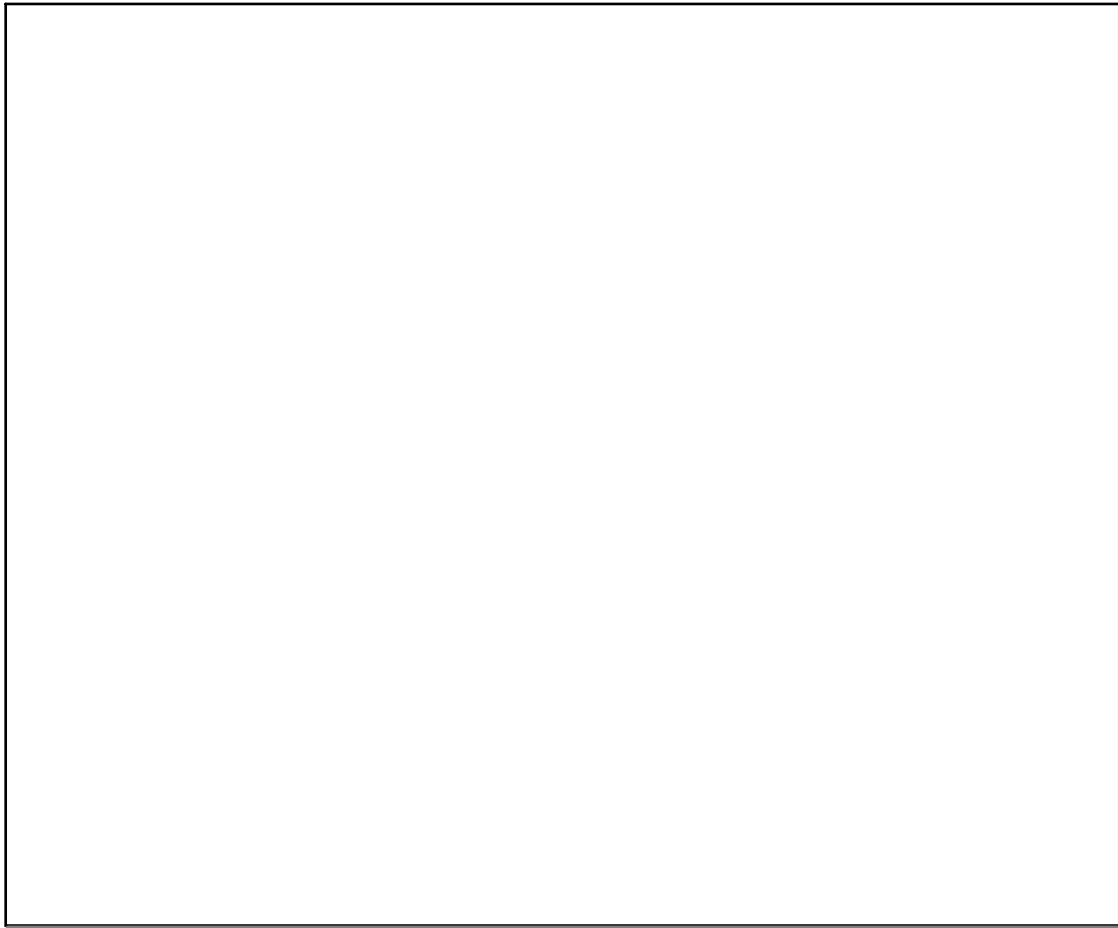
Reasonable Unreasonable Why? economy, summer travel

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## Seatwork

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