Lesson 3.2 – Using Scatter Plots to Identify Relationships

Goal: Create, interpret, and analyse two-variable data using scatter plots

What is a Scatter Plot?

A graphical representation of _____

Creating a Scatter Plot

EXAMPLE   Shayna recorded the cost of customers restaurant bill and the amounts they left her as a tip

$ Bill	$25.15	$38.49	$19.27	$49.66	$32.45	$72.14
$ Tip	$4.00	$5.50	$2.50	$9.00	$5.00	$14.00

Steps:

- Title
- Axes labels
  - Independent variable (_____) relies on nothing
  - Dependent variable (_____) relies on independent variable
- Appropriate scale
- Plot the (x, y) coordinate pairs
- Draw a Line of Best Fit (LOBF)

Interpreting a Scatter Plot

EXAMPLE   Jay researched estimates for a job painting his house. The scatter plot below shows Jay's results.

a)   Which is the dependent variable?

Hiring a Painting Company

b)   Which two companies will take the longest? Which of these two is cheaper?

c)   Which two companies charge the same amount?

Analyzing a Scatter Plot

A **correlation** indicates the strength and direction of a _____ between two variables

- **Positive** Correlation: Points on a scatter plot go _____ and to the _____
- **Negative** Correlation: Points on a scatter plot go _____ and to the _____
- **Strong** Correlation: Points on a scatter plot _____
- **Moderate** Correlation: Points on a scatter plot _____
- **Weak** Correlation: Points on a scatter plot _____

EXAMPLE   Classify each of the following scatter plots

EXAMPLE   Davis conducted an experiment comparing a person's leg length and how long it takes to
walk 100 m. His data is shown in the scatter plot.

a)   What sort of relationship does the graph suggest between leg length and time
taken to walk 100 m?

Leg Length and
Time Taken to Walk 100 m

b)   Use the scatter plot to estimate the time it would take a person with a leg
length of 85 cm to walk 100 m

c)   How might Davis make the results of his experiment more reliable?
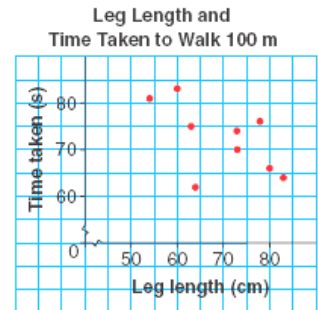
Considering Cause & Effect

Observing a relationship between two variables does _____ mean that one variable _____
a change in the other. **Other factors could be involved**, or the correlation could be a **coincidence**. Some
relationships are natural and/or obvious, while others may have a **common cause** to both variables.

EXAMPLE   State whether the claim in each situation is reasonable. If not, determine if there is a common
cause, or if the relationship is coincidental.

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.

b)   Mila discovered a positive correlation between ice cream sales and the number of drowning incidents. She
warned all of her friends not to eat ice cream if they intended on going swimming.

c)   Since the 1950s the concentration of carbon dioxide (CO_2) in the atmosphere has been increasing. Crime
rates in most countries have also increased over this time period. A newspaper reports that the increase
in CO_2 level in the atmosphere cause people to commit crimes.

Practice: Page 142 #1 – 6, 8, 10, 12