

MAP4C1 Unit 3: Two-Variable Data

### 3.1 One and Two-Variable Data

Learning Goals: I am learning to...

- Compare one and two variable data and explain the different between them
- Identify if a given situation involves one or two variable data and determine the best graph to use when representing this data.



Recall Key Terminology:

<b>Variable</b>	An unknown value/attribute that can be measured
<b>One-Variable Data</b>	<ul style="list-style-type: none"> <li>• The measure of frequency</li> <li>• Counts the number of occurrences possible</li> <li>• Displayed as: bar graph, pie chart, histogram</li> <li>• Analyzed using mean, median, mode &amp; range.</li> </ul>
<b>Two-Variable Data</b>	<ul style="list-style-type: none"> <li>• The relationship between two quantities</li> <li>• Compare independent/ vs. dependent variables</li> <li>• Displayed as a scatterplot</li> <li>• Analyze using correlation, linear and non-linear regression.</li> </ul>
<b>Correlation</b>	measures the strength of the relationship between two variables

In order to identify situations of one- or two-variable data, ask yourself the following questions:

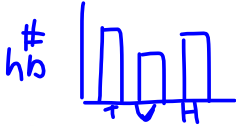
1. What is the information measuring?
2. How can the information be displayed?
3. How can the information be analyzed?

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**Example 1:** State whether each situation involves one-variable or two-variable data. **Justify** your answer.

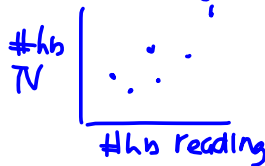
a) Noah researches the annual hours of sunshine in Canadian cities.

One Variable → only collecting one piece of data/ city  
(# hours of sunshine/year)



b) A study compares the amount of time spent watching TV with the amount of time spent reading.

Two-variable → collecting 2 different measures.



**Types of Data**

There are 3 main types of data that can be collected:

Categorical Data	Discrete Data	Continuous Data
<ul style="list-style-type: none"> <li>• Non-numerical data arranged into categories.</li> <li>e.g. colour, sports, tv shows</li> </ul>	<ul style="list-style-type: none"> <li>• Numerical data that is specific and can be counted</li> <li>e.g. age, days,</li> </ul>	<ul style="list-style-type: none"> <li>• Numerical data that can hold any value.</li> <li>e.g. height, temperature</li> </ul>

**Types of Graphs**

There are 4 main ways in which data can be displayed in a graph

Bar Graph	Histogram	Pie Chart	* Scatter Plot
<ul style="list-style-type: none"> <li>• one-variable</li> <li>• shows the frequency</li> <li>• categorical data &amp; discrete</li> </ul>	<ul style="list-style-type: none"> <li>• one-variable</li> <li>• shows frequency of a range of data.</li> <li>• continuous data</li> </ul>	<ul style="list-style-type: none"> <li>• one-variable</li> <li>• shows proportion of each value</li> <li>• categorical data</li> </ul>	<ul style="list-style-type: none"> <li>• Two-variable</li> <li>• shows 2 pieces of data for each point</li> <li>• discrete and continuous</li> </ul>

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In order to identify which graph to use, ask yourself the following questions:

1. Is it one- or two-variable data?
2. What type of data is it?

**Example 2:** For a class project, Danny surveyed students about their part-time jobs. The data is shown in the table below.

Student	Weekend hours	Weekday Hours
Anya	5.0	12.5
Ellen	8.0	12.0
Fiona	17.0	8.0
Aaron	0.0	16.5
Leila	10.0	16.0
Mason	9.5	8.0
Petra	15.0	6.0

- a) What type of graph would be best to show how many hours a student worked on the weekend?

one-variable continuous data → Histogram

- b) What type of graph would be best to show a possible relationship between the number of hours worked on the weekend vs. weekday?

two-variable continuous data → Scatter plot