Lesson 3.1 – One & Two Variable Data

**Goal:** Examine differences between one and two variable data and explore how each are represented

**TERMINOLOGY**

- **Variable:** an unknown value/attribute that can be measured
- **One-variable data:** gives the measures of one attribute
  - Counts the number of occurrences for possible values of the variable
  - Often displayed as: Frequency tables, bar graphs, pie charts
  - Analyzed using: average (mean), median (middle), and mode (most frequently occurring), as well as range, variance, and standard deviation (recall grade 11)
- **Two-variable data:** gives the measures of two attributes
  - Compares the values of the independent and dependent variables
  - Often displayed as: scatter plots, ordered pairs, or graphs
  - Analyzed using: correlations, linear regression, and non-linear regression (more to come...)
- **Mean:** the average of a set of one-variable data
- **Median:** the middle value in a SORTED set of one-variable data
- **Mode:** the most frequently occurring value in a set of one-variable data
- **Correlation:** measures the strength of the relationship between two variables

**Identifying Situations of One and Two Variable Data**

Ask yourself: 1. What is this information measuring? 2. How can this information be displayed? 3. How can this information be analyzed?

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

a) Noah researches annual hours of sunshine in Canadian cities.
   - **One variable data**
     Noah is only measuring hours of sunshine.

b) A study compares the amount of time people spend watching TV and the amount of time reading.
   - **Two variable data**
     The study is comparing time watching TV and time spent reading.
**Types of Data**

- **Categorical Data**: Non-numerical data that is arranged into categories
  - Examples: favourite pie, favourite colour.

- **Discrete Data**: Numerical data that is distinct (specific) and can be counted
  - Examples: # of people, favourite number

- **Continuous Data**: Numerical data that can hold any value
  - Examples: height, weight

**Displaying Data**

**Bar Graph**
- One variable data
- Shows frequency of each data value
- Used for discrete or categorical data

**Histogram**
- One variable data
- Shows frequency of a RANGE of data values
- Used for continuous data

**Pie Chart**
- One variable data
- Shows proportion of each data value
- Used for categorical data

**Scatter Plot**
- Two variable data
- Shows two pieces of info for each item
- Used for discrete or continuous data

**Deciding Which Graph to Draw**

Ask yourself:
1. Is it one or two variable data?
2. What type of data is it?

**Example 2**
For a class project, Dylan surveyed students about their part-time jobs. The data is shown below.

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

Use a **Histogram**

b) What type of graph would best show a possible relationship between weekday and weekend hours?

Use a **Scatter plot**!

<table>
<thead>
<tr>
<th>Student</th>
<th>Week Hours</th>
<th>Weekend Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anya</td>
<td>5.0</td>
<td>12.5</td>
</tr>
<tr>
<td>Ellen</td>
<td>8.0</td>
<td>12.0</td>
</tr>
<tr>
<td>Fiona</td>
<td>17.0</td>
<td>8.0</td>
</tr>
<tr>
<td>Aaron</td>
<td>0.0</td>
<td>16.5</td>
</tr>
<tr>
<td>Leila</td>
<td>10.0</td>
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<tr>
<td>Mason</td>
<td>9.5</td>
<td>8.0</td>
</tr>
<tr>
<td>Petra</td>
<td>15.0</td>
<td>6.0</td>
</tr>
</tbody>
</table>

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