THE ERINDALE ACADEMY

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Unit 5: Organization of Data

Lesson 5.1 (Chapter 2.1): Data Concepts & Graphical Summaries

Learning Goal: Understand characteristics of data and show how data are used and misused in statistical studies

Statistics is the gathering, organization, analysis, and presentation of data. You can apply statistical methods to do almost any kind of data analysis.

Types of Data: There are two main types of data, each of which has two sub-types.

Numerical Data (quantitative):

1. **Discrete** data:

    Examples:

2. **Continuous** Data:

    Examples:

Categorical Data (qualitative):

1. **Ordinal** Data:

    Examples:

2. **Nominal** Data:

    Examples:

Displaying Data: In order to analyze data, it is useful to display data using tables and graphs. You can use a variety of graphical summaries to display data. Some are better for categorical data, some are better for discrete data, while others are better for continuous data.
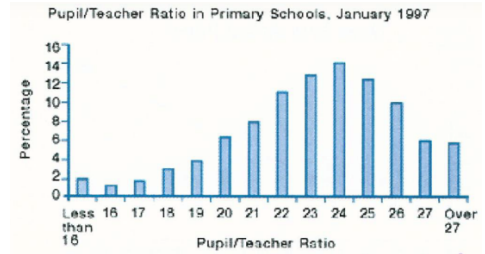
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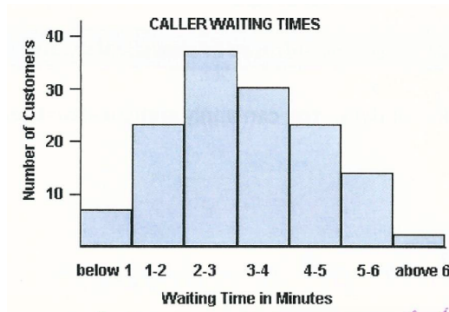1576 Dundas Street West, Mississauga ON L5C 1E5
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Frequency Table (Tally chart)

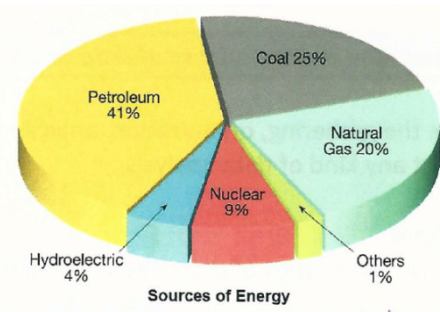| Method of Travel	Tally	Frequency	%
Walk	ＷＷ ＩＩＩＩ	9	30
Bike	ＩＩＩ	3	10
Car	ＷＷ Ｉ	6	20
Bus	ＷＷ ＷＷ ＩＩ	12	40
	TOTAL	30	100

Bar or Column chart

Histogram

Circle Graph (Pie Chart)

Frequency Polygon (Line Graph)
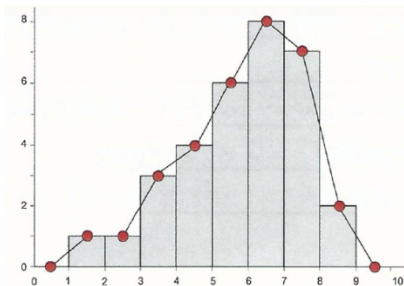
Cumulative frequency polygon

Scatter Plot

Does Area Affect Price?
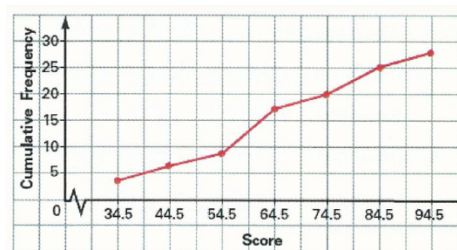
Others:

Relative frequency Polygon

Pictographs

Dot plots

Stem & Leaf Plots

Example 1: Suppose you did a survey of students to determine movie genre preferences and collected the data shown below. Use an appropriate graph to display his set of data.

Action	Comedy	Romance	Drama	Science fiction
8	11	6	2	3

<mark>Drawing a Histogram</mark>: When there is a large amount of data that spans a big range, it is often helpful to group the data in order to make tables and graphs easier to construct and to interpret.

Rules for grouping data to draw histogram:

1. The number of intervals should usually be between 5 and 20 and should cover all of the values in the data set (7 – 9 intervals are usually best for a presentation!)

2. Make all intervals equal in length. To determine the bin width (the width of each interval), divide the range by the number of intervals that you want. Always round to the next integer (ex. If the bin width is 3.1, round it to 4)

3. Using interval notation, choose intervals so that there are no gaps in between them and so that none of the data lie on the interval boundary.

ple 2

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Example 2: calculate the bin width that would make five uniform intervals then make a frequency table and draw a histogram.

13, 7, 5, 7, 9, 10, 5, 11, 8, 7, 9, 10, 10, 11, 14, 10, 6, 12, 6, 9, 7, 12, 9, 10, 6

Intervals	Tally	Frequency

Task:

1) Read through Example 1 on page 197 and Example 3 on page 200. Take some brief notes to help you understand.
   a) How data can be used and misused in statistical studies and
   b) That there is variability in data.

2) Finally, copy the Key Concepts found on page 203.