

Unit 2: Data Collection

Unit Overview

Data collection is big business these days! Companies like Google have made their fortune by sorting and analyzing data in innovative ways. In Unit 2, we will be developing tools to help us with data collection through a series of case studies and assignments. *[Note: numbers in brackets refer to textbook sections]*

2.1 Introduction to Data

Case Study: Girls do more homework than boys

Sources Used: OECD (PISA), Gapminder World

Concepts	Skills
<input type="checkbox"/> Understand the use of different types of data visualization (1.1) <input type="checkbox"/> Come up with conclusions from data visualizations (1.2)	<input type="checkbox"/> Identify data as the following: Continuous vs Discrete data, Quantitative vs Qualitative data, Primary vs Secondary data <input type="checkbox"/> Know when to use a bar graph and when to use a histogram

2.2 What is Fair?

Case Study: The 1972 Ford Pinto

Concepts	Skills
<input type="checkbox"/> Understand utilitarianism and its dangers	<input type="checkbox"/> Identify whether or not a game is mathematically fair <input type="checkbox"/> Calculate the expected value of a probability game

2.3 Always Go to the Source

Case Study: Scientists vs American Public [Pew Research Study]

Sources Used: Pew Research Center

Concepts	Skills
<input type="checkbox"/> Use and understand key terminology in the methodology of a survey	<input type="checkbox"/> Interpret data in a split-bar graph (1.2) <input type="checkbox"/> Identify data from a: Population vs Sample, Census vs Study (1.2)

2.4 Reporting on Data

2.4 Assignment: Create Newspaper Article [with appropriate data visualization and analysis]

You are a Journalist for the Bosco Times. Your teacher is the editor. Your job is to write a news piece based on some recently published data of your choosing. The top 3 articles (as voted on by the class) will feature on the cover page of the first edition of the Bosco Times digital newspaper! A catchy headline and easy to read data will be key to success.

Concepts	Skills
<input type="checkbox"/> Understand how data can be misrepresented (1.5) <input type="checkbox"/> Choose an appropriate type of data visualization for a data set	<input type="checkbox"/> Identify reliable sources of data (2.6) <input type="checkbox"/> Create different types of data visualization by hand and using technology <input type="checkbox"/> Cite data appropriately

2.5 Big Data**2.5 Assignment: Create an Infographic [with several data visualizations including a scatter plot]**

You are on the research team of Bosco Public Health. Your job is to create a PSA (public service announcement) poster to promote healthy living in the Don Bosco community by analyzing health trends in Toronto and Canada. You will need to bring together data from different sources and analyze it using regression techniques. Clear communication is the key to public health. Make the data speak for itself...

Case Study: Gapminder World

Concepts	Skills
<input type="checkbox"/> Understand the concept of Big Data and its uses <input type="checkbox"/> Understand meta-analysis and the limitations of relying on one study <input type="checkbox"/> Understand correlation and causation (1.2)	<input type="checkbox"/> Format and share data for use by others (2.7) <input type="checkbox"/> Identify independent and dependent variables (1.3) <input type="checkbox"/> Create scatter plots by hand and using technology (1.3) <input type="checkbox"/> Create trendlines using technology (1.4)

2.6 Your Data**2.6 Assignment: Conduct a survey and report on the results**

You are a Research Associate in a non-profit, non-partisan research agency: Bosco Research Unlimited. You have been hired by student council to create and conduct a survey about improving student life at Don Bosco. What are students unhappy about? What do they want more of? Let's get to the bottom of it by developing a thesis and testing it.

Concepts	Skills
<input type="checkbox"/> Understand bias in data collection (2.5) <input type="checkbox"/> [Unit 3 Intro] Understand where a normal distribution can be applied (3.2)	<input type="checkbox"/> Develop a thesis (2.1) <input type="checkbox"/> Identify the different types of studies (2.2) <input type="checkbox"/> Create effective survey questions (2.4) <input type="checkbox"/> Know when to use each type of random sampling (2.3)