

CHAPTER 3

REVIEW

List of topics covered in this unit

- population and sample
- bias
- primary vs. secondary sources

- frequency tables
- types of graphs (bar, histogram, line, circle)

- mean, median and mode

- box and whisker diagrams, percentiles, quartiles

- range, variance and standard deviation

- types of distribution (normal, bimodal, skewed)

Population and Sample:

Mr. Atkinson wants to know who is the 'illest' teacher in the school. He asks as many students as he can during one lunch block.

Sample: some H.S. students

Population: H.S. Students

Bias:

The student council asks students in each homeroom:

"Do you think it's fair that the principal is planning to ban cell phones in the hallways, and the cafeteria, even though they don't cause any problems?..."

Is this survey biased in any way?

wording - leading question
sample - too big but good representation

Primary vs. Secondary sources:

Primary - data collected by yourself

Ex.

ask students their favourite food

Secondary - data collected by someone else

Ex.

census

Frequency Table:

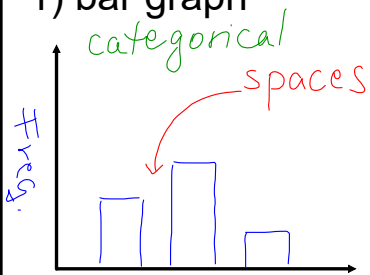
At what age did you get your first job?

included not included

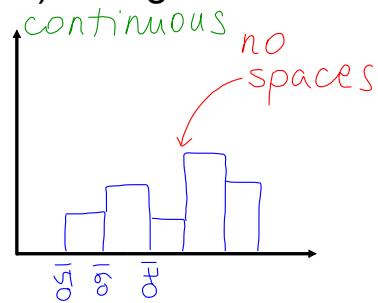
Age	Tally	Frequency
[10 - 14)		
[14 - 18)		
[18 - 22)		
[22 - 26)		
[26 - 30)		

Types of Graphs:

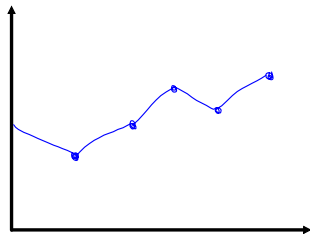
1) bar graph



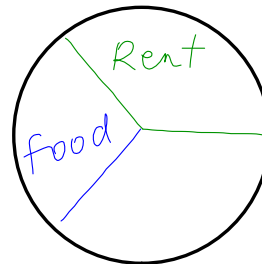
2) histogram



3) line graph



4) circle graph



$$\frac{\text{freq.}}{\text{total}} \times 360^\circ$$

Mean, Median & Mode:

Calculate the mean, median and mode.

37, 38, 41, 37, 42, 44, 51, 38

$$\text{Mean} = \frac{328}{8} = 41$$

$$\text{Median} = \frac{38 + 41}{2} = 39.5$$

$$\text{Mode} = 37 \text{ and } 38$$

Range, Variance & Standard Deviation:

Calculate the range, variance and standard deviation: **61, 83, 77, 88, 67, 71**

Range = $88 - 61 = 27$

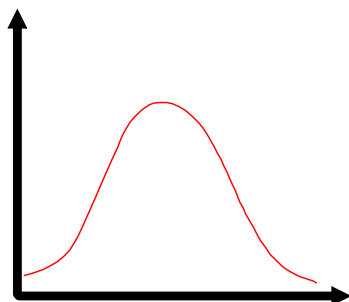
Variance: mean $\frac{447}{6} = 74.5 \doteq 75$
 data \downarrow
 $x - \bar{x}$ $(x - \bar{x})^2$

$61 - 75 = -14$	196
$83 - 75 = 8$	64
$77 - 75 = 2$	4
$88 - 75 = 13$	169
$67 - 75 = -8$	64
$71 - 75 = -4$	16
	<hr/>
	513

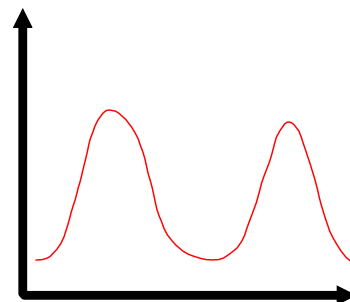
variance = $\frac{513}{6} = 85.5 \doteq 86$

Standard Deviation = $\sqrt{86} = 9.25$

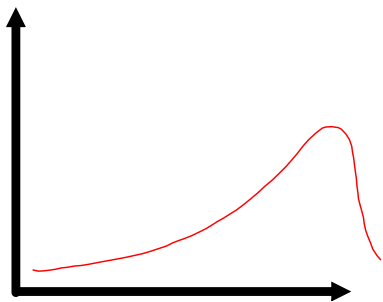
Types of Distributions:



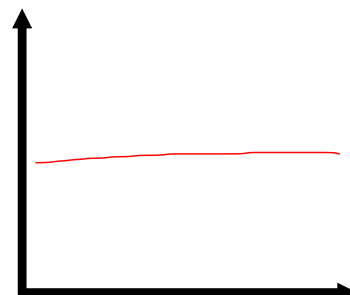
normal



bimodal



skewed (left)



uniform

Extra Work

Pg 156 # 1-14

3.1 Sampling Techniques, pages 102–109

1. In each situation, identify the sampling technique.
 - a) Kuljit went to the local music store to ask what people thought of the “Canadian Idol” winner’s debut CD.
 - b) The school council has set up a booth at the front of the school on Parents’ Night to ask about changing the school uniform.
 - c) Sherry asks 20 girls and 20 boys on the school sports teams if the sports council should spend the fundraising money on new football equipment.
2. Cary plans to survey 100 people. Describe how Cary can choose a stratified sample if her survey population contains 1200 people, and 60% are female.

3. Describe how a graphing calculator can be used to choose a random sample of 15 people from a population of 200 people.

3.2 Collect and Analyse Data, pages 110–117

4. Rewrite the survey question so that it does not contain bias.

Most schools hold a carnival during their Spirit Week, which is usually a great success. Do you think that having a carnival would be a good idea for this year’s Spirit Week?

5. Identify the type of bias in each survey.
- A survey to determine the effectiveness of a government's social services is conducted at a homeless shelter.
 - A survey sent via the Internet asks people to answer a questionnaire and email it to a central processing station.
 - When asked to circle their favourite candidate in the student council, the choices were:
The President
The secretary
The treasurer
Other: _____
6. Randy decides to hand out a survey to every fifth person entering the school. He asks them to fill it out and hand it in at the office when they are done.
- What type of sampling technique is Randy using?
 - How could this sampling technique lead to inaccurate results?

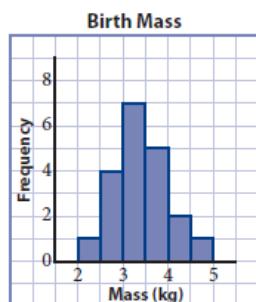
3.3 Display Data, pages 118–129

7. The table shows the approximate amount of time Le Hing spent on various activities in one week.

Activity	Time (h)
doing homework	8.0
watching television	6.0
making phone calls and text messaging	8.0
playing volleyball	3.0
practising guitar	6.0

- Which two types of graphs could Le Hing use to display the information?
- Display the data using each type of graph.

8. The histogram shows the birth masses, in kilograms, of babies born at a hospital in one week.



- How many babies were born with a mass of at least 4.0 kg?
- What percent of the babies born were at least 2.0 kg but less than 3.5 kg?
- Explain why birth mass can be displayed in a histogram.

3.4 Measures of Central Tendency, pages 130–139

9. Find the mean, the median, and the mode for each set of data.
- 21, 45, 53, 47, 82, 21, 64, 77, 54, 92, 91, 72
 - 4, 7, 11, 8, 6, 6, 5, 3, 5, 7, 8, 14, 17, 18, 6, 4, 2, 2
 - 77, 78, 67, 54, 82, 91, 71, 73, 64, 68, 53, 87, 79
10. A gallery has these items for sale.
- 12 bronze statues for \$500 each
 - 50 paintings for \$100 each
 - 100 hand-painted tiles for \$25 each
- Find the mean, the median, and the mode of the prices.
 - Which measure of central tendency best represents the price of an item at the gallery? Explain.

3.5 Measures of Spread, pages 140–147

11. Find the range, the variance, and the standard deviation for each set of data.
- 28, 51, 91, 47, 56, 77, 64, 52, 71, 63
 - 202, 205, 213, 197, 200, 190, 198, 195
12. If you were the general manager for an NBA basketball team, would you prefer a larger or smaller standard deviation for player heights on your team? Explain.

3.6 Common Distributions, pages 148–155

13. Describe the characteristics of each distribution and give an example of each.
- a skewed distribution
 - a bimodal distribution
 - a normal distribution

14. The table shows the results of a test out of 100.

Mark Interval	Tally	Frequency
[30–40)		
[40–50)		
[50–60)		
[60–70)		
[70–80)		
[80–90)		
[90–100]		

- Copy and complete the table. Use the data to create a histogram.
- Do the data appear to be normally distributed? Explain.