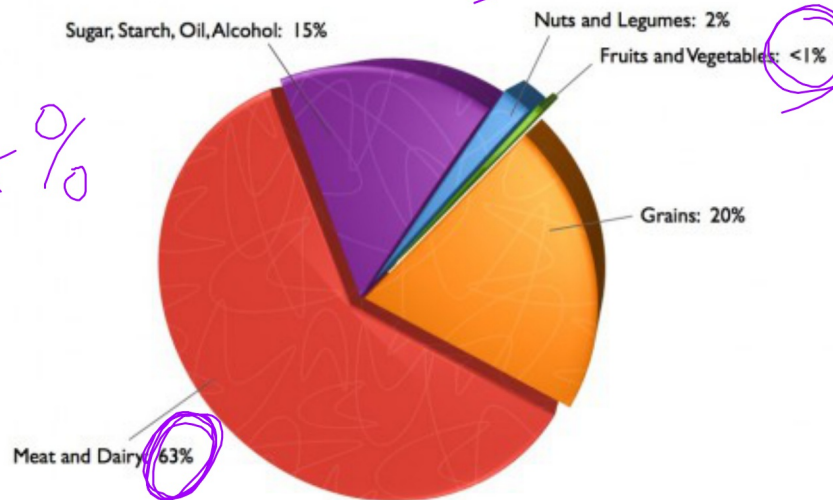


What do you notice, wonder??

Where the Money Goes: The Foods That Subsidies Support



100+%

Class Plan: Unit 7: Statistics

1) Warm-up, intro statistics.

2) Define data
-Video break

Categorical Data
vs
Numerical Data

STATISTICS (Chapter 10) 189

A

TYPES OF DATA

3) Compare discrete and
continuous data.

4) Practice, take survey! :)

Unit 6: Statistics

Chapter

10

Statistics

- Contents:**
- A** Types of data
 - B** Discrete numerical data
 - C** Continuous numerical data
 - D** Measuring the centre of a data set
 - E** Cumulative data
 - F** Measuring the spread of a data set
 - G** Box-and-whisker plots



**Unit 6:
Statistics**

Chapter

17

**Comparing
numerical data**

- Contents:**
- A** Comparing the measures of centre and spread
 - B** Comparing data sets graphically
 - C** Parallel box-and-whisker plots



So... What is Statistics?

Statistics:

A branch of mathematics concerned with how **information** is **collected, organized, presented, summarized, and then analyzed...** so that *conclusions may be drawn from the information.*

Statistics **is** a branch of mathematics.

Statistics **are** collection of facts/data about a group.

A singular statistic **is** a quantity calculated from data.
(mean, median, mode, range)

The word **statistics** can be used in three different contexts:

- **Statistics** is a branch of mathematics that is concerned with how information is collected, organised, presented, summarised, and then analysed so that conclusions may be drawn from the information.
- **Statistics** are a collection of facts or data about a group or population.
- The singular **statistic** refers to a quantity calculated from sample data. For example, the mean is a statistic, and the range is a statistic.

Noteworthy Ideas of Statistics

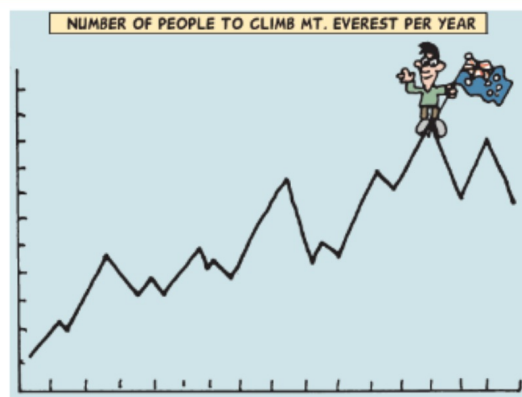
SO MUCH INFO.

Some may say... TMI :)

In today's world vast quantities of information are recorded. We record the populations of countries and how they are distributed, the number of children in families, the number of unemployed people, how much food and manufactured goods are produced, daily temperatures, and much more.

Noteworthy Ideas of Statistics What do we do with it?

Many groups in our society use the information collected to help them discover facts, make decisions, and predict outcomes. Government departments, businesses, and scientific research bodies all use statistics.



So... What is Statistics?

How to choose 2017 NCAA Champion



Statistics pick the 2017 NCAA Tourney Champion

<https://www.youtube.com/watch?v=iTht4t7lgSA>

What are the earliest recordings of statistics?

HISTORICAL NOTE

The earliest statistical recordings include:

- ancient **Babylonians** recorded their crop yields on clay tablets
- ancient **Egyptian pharaohs** recorded their wealth on stone walls.

More recently:

- **William Playfair** (1759 - 1823) developed the histogram to display data.
- **Florence Nightingale** (1820 - 1910) kept records of the dead and injured during the Crimean War. She developed and used graphs extensively.
- **John Tukey** (1915 - 2000) invented the stem plot in 1972.



Florence Nightingale

DO: Respond to the following questions to begin thinking about our new unit on statistics.

OPENING PROBLEM

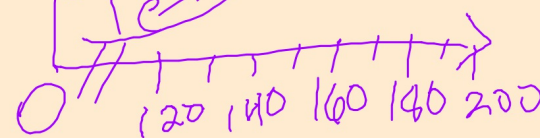
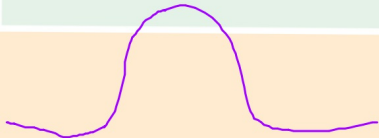
The heights of 1294 Year 10 girls were measured. The results were recorded in classes in the frequency table alongside.

Height (cm)	Frequency
$120 \leq h < 130$	1
$130 \leq h < 140$	0
$140 \leq h < 150$	34
$150 \leq h < 160$	139
$160 \leq h < 170$	478
$170 \leq h < 180$	642
Total	1294

Things to think about:

- a Is the data categorical or numerical?
- b Why was the data recorded like this?
- c Is the data discrete or continuous?
- d What does the height $140 \leq h < 150$ actually mean?
- e How could this data be displayed?
- f How can the *shape* of the distribution be described?
- g Do we know the exact height of the shortest girl?
- h How could we estimate the mean and median of this data?

Too much data
 histogram
 skewed left



DO: Respond to the following questions to begin thinking about our new unit on statistics.

OPENING PROBLEM

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Two Types of Data:

Categorical Data vs. Numerical Data

What's the difference?

A

TYPES OF DATA

Complete at your tables:

Data _____

[*Categorical Data _____]

**Numerical Data _____

- Discrete Numerical _____

Examples: _____

- Continuous Numerical _____

Examples: _____

A

TYPES OF DATA

Data A piece of information we collect

[*Categorical Data Describes a quality/characteristic]

Numerical Data Data given in **number form

- Discrete Numerical Data that can only have **distinct values** (results from **counting**)

Examples: soccer goals, siblings

- Continuous Numerical Data that can be a **range of values** (results from **measuring**)

Examples: weight, height, time, temp

volume, width, distance, depth

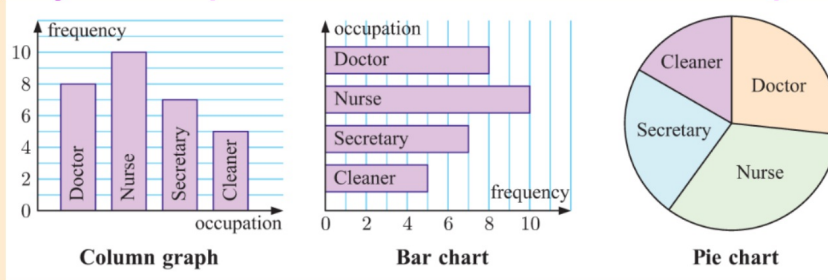
CATEGORICAL DATA

A **categorical variable** describes a particular quality or characteristic. The data is divided into **categories**, and the information collected is called **categorical data**.

A **categorical variable** describes a particular quality or characteristic. The information collected is called **categorical data**.

Example

Category: occupation of workers at a hospital



NUMERICAL DATA

A **numerical variable** is one for which data is given in number form. The information collected is called **numerical data**.

A **numerical variable** is one for which data is given in number form. The information collected is called **numerical data**.

[Examples?](#)

Discrete and Continuous Data

A **discrete numerical variable** can only take distinct values. It is usually the result of **counting**. *(can take the values 1,2,3,4...)*

Examples?

number of goals scored by a soccer player

A **continuous numerical variable** can take *any* value within a certain range. It is usually the result of measuring.



Examples?

The *weight of pumpkins* is a continuous numerical variable. It can take any value from about 1 kg to 15 kg.

Group Practice...

EXERCISE 10A

C

DN

CN

1 Classify the following data as categorical, discrete numerical, or continuous numerical:

- | | |
|---|---|
| a the number of pages in a magazine | b the temperature in Brazil |
| c the manufacturer of a motorcycle | d a person's preferred football code |
| e the position taken by a netballer | f the width of a person's hand |
| g the time taken to travel to school | h the area of a block of land |
| i the number of goals saved by a goalkeeper. | |

Group Practice...

EXERCISE 10A

1 Classify the following data as categorical, discrete numerical, or continuous numerical:

- the number of pages in a magazine Discrete Num
- * the manufacturer of a motorcycle Categorical
- * the position taken by a netballer ^{form of ~~SD~~} Categorical
- the time taken to travel to school Continuous Num
- the number of goals saved by a goalkeeper. Discrete Num
- the temperature in Brazil Continuous Num
- * a person's preferred football code Categorical
- the width of a person's hand Continuous Num
- the area of a block of land Continuous Num

Netball...

Netball is a ball sport played by two teams of seven players. Its development, derived from early versions of basketball, began in England in the 1890s. By 1960, international playing rules had been standardised for the game, and the International Federation of Netball and Women's Basketball (later renamed the [International Netball Federation \(INF\)](#)) was formed. As of 2011, the INF comprises more than 60 national teams organized into five global regions.

Games are played on a rectangular court with raised goal rings at each end. Each team attempts to score goals by passing a ball down the court and shooting it through its goal ring. Players are assigned specific positions, which define their roles within the team and restrict their movement to certain areas of the court. During general play, a player with the ball can hold on to it for only three seconds before shooting for a goal or passing to another player. The winning team is the one that scores the most goals. Netball games are 60 minutes long. Variations have been developed to increase the game's pace and appeal to a wider audience.

<https://en.wikipedia.org/wiki/Netball>



Malawi (red) playing Fiji (blue) at the 2006 Commonwealth Games

Highest governing body	International Netball Federation
Registered players	561,000+ ^{as of 2011}
Characteristics	
Contact	Limited
Team members	Seven on-court players per team
Mixed gender	Yes, separate competitions and mixed gender teams
Type	Team sport, ball sport
Equipment	Netball, bib
Venue	Netball court

Team 9 Survey

Do: Survey *numerical responses*

<https://goo.gl/PHS9KE>

Done:

- 1) Exercises #2 and #3 (on back of notes page)
- 2) Reflect on the survey questions and a pair of questions that interests you.

2 A sample of lamp posts was surveyed for the following data. Classify the data as categorical, discrete numerical, or continuous numerical:

- a the diameter of the lamp post
- b the material from which the lamp post is made
- c the location of the lamp post (inner, outer, north, south, east, or west)
- d the height of the lamp post
- e the time since the last inspection
- f the number of inspections since installation
- g the condition of the lamp post (very good, good, fair, or unsatisfactory).



- 3** For each of the numerical variables below, determine whether the variable is discrete or continuous. If the variable is discrete, list the values the variable is likely to take. If the variable is continuous, write down the *range* of values the variable is likely to take.
- a** The result obtained when an ordinary die is rolled.
 - b** The length of a person's thumb.
 - c** The number of pins knocked down in one roll of ten pin bowling.
 - d** The time it takes to run 100 metres.
 - e** The number of students in a class.

SOLUTIONS

EXERCISE 10A

- 1** **a** discrete numerical **b** continuous numerical
 c categorical **d** categorical **e** categorical
 f continuous numerical **g** continuous numerical
 h continuous numerical **i** discrete numerical
- 2** **a** continuous numerical **b** categorical
 c categorical **d** continuous numerical
 e continuous numerical **f** discrete numerical
 g categorical
- 3** **a** discrete; 1, 2, 3, 4, 5, 6 **b** continuous; 2 cm - 8 cm
 c discrete; 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
 d continuous; 9.6 sec - 25 sec
 e discrete; 1, 2, 3, 4, ..., 50 say