

# Collecting and using data

Wednesday, 27 February 2019 8:07 AM

★ By the end of the lesson I would hope that you have the knowledge and understanding for the following points:

- Know why we collect information
- Know what it means to conduct a survey
- Know what the following terms mean:
  - Population
  - Sample
- Know what statistical data is
- Know how to describe if questions asked will provide the answers required

## RECAP:

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The great thing about Mathematics is that we teach you the same thing over and over again and hope, with each year, that a little but more of it sticks. I suppose, it's a little like throwing mud at a wall, the more you do it, the more it sticks!

We have been talking about data since Year 8. Much of what follows in this lesson is stuff we have done before.

I think the only new thing which is introduced is that Categorical Data can be split into two subcategories.

With that in mind lets begin!

## RECAP: Language for collecting and using data

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### POPULATION

A population describes a whole group of people.  
We generally define what the population might be.

#### Examples:

- All year 12 students in Australia
- All 18 year old's in the world
- Every male in Victoria
- Every female in London

These are all examples of populations.

We might choose to look at all year 12 students in Australia.

We might then choose to look at a smaller group of these students.

### SAMPLE

This is a (small) group of people selected from the **population**.

For example, if the **population** is all Year 12 students in Australia, my **sample** might be all the Year 12 students in Victoria.

As Victoria, is a smaller part of Australia, then we are taking a **sample** of my **population**.

|| A sample **MUST** be taken from the **population** from which you wish to find information.

The question is ... how do we choose which sample to take?

|| Why did I choose Victoria?

|| Why didn't I choose New South Wales?

It's not always practical to think of **samples** and **populations** which are so large.

Let's make it smaller.

I'm going to count my **population** as all the Year 12 students in my school.

I'm going to **sample** 50 of these Year 12 students.

## RECAP: Types of data

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Once we have decided on a sample we need to decide what it is we are trying to find an answer to.

The whole reason for collecting data is to find the answer to a problem.

The questions we ask much be clear, non-biased and take into account all the people we might be surveying.

### TYPES OF DATA

|| Numerical

## TYPES OF DATA

### Numerical

Remember, Numerical data is data which deals with **numbers**.  
This can be split into two sub categories:

#### DISCRETE

Data which can only take whole number values and can (generally) be counted

27.4

6'2

7.5

#### CONTINUOUS

Data which needs to be measured and can take decimal values.

Time

Height

Weight

23

23.1

23.14

23 148762  
          

#### CATEGORICAL

Before today we have known that this is data which is described using words.

Examples are:

- Eye colour
- Favourite football team
- State of Australia you live in

Blue Green Hazel Brown

But there are others words we can use to describe answers, which are slightly different:

- Temperature
- Skill at a sport
- How you are doing in Mathematics
- Size of clothes

S      M      L  
Small    Medium    large

Average    Good    Excellent

Categorical data can be split into **NOMINAL** and **ORDINAL** data.

**ORDINAL**: Means the data can have an order e.g. High, Medium, Low

**NOMINAL**: Means the data has no order e.g. Eye Colour



### How do we use this in Mathematics?

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Let's look at some questions from the *Cambridge Essentials Textbook Series*:

What type of data would the following survey questions generate?

- a How many televisions do you have in your home? Numerical Discrete ✓
- b To what type of music do you most like to listen? Categorical Nominal ✓

Jazz Pop Rock Funk

A survey is carried out on the internet to determine Australia's favourite musical performer.

Why will this sample not necessarily be representative of Australia's views? \*

**SOLUTION**

An internet survey is restricted to people with a computer and internet access, ruling out some sections of the community from participating in the survey.

**EXPLANATION**

The sample may not include some of the older members of the community or those in areas without access to the internet. Also, the survey would need to be set up so that people can do it only once so that 'fake' surveys are not completed.

