

## REVISION: DATA HANDLING & PROBABILITY

19 SEPTEMBER 2013

### Lesson Description

In this lesson, we

- Revise data handling and probability by doing some typical exam questions

### Key Concepts

#### Collecting Data

When collecting data based on categories we can organise it in a frequency table.

What do learners in my class like to drink?		
Types of drink	Tally	Frequency
Fizzy drink		7
Water		15
Fruit juice		8

(Adapted from *Solutions for All: Maths Literacy, Grade 10, Macmillan, Chapter 18, page 330*)

When data is collected as numbers we can group it and record the frequency for each group:

My class's LO test marks out of 50	
Class interval	Frequency
$0 < x \leq 10$	0
$10 < x \leq 20$	2
$20 < x \leq 30$	4
$30 < x \leq 40$	12
$40 < x \leq 50$	7

(*Solutions for All: Maths Literacy, Grade 10, Macmillan, Chapter 18, page 330*)

#### Summarising Data

When summarising data we look for the following important values:

- The minimum value
- The maximum values
- The range (difference between maximum and minimum)

## Measures of Central tendency

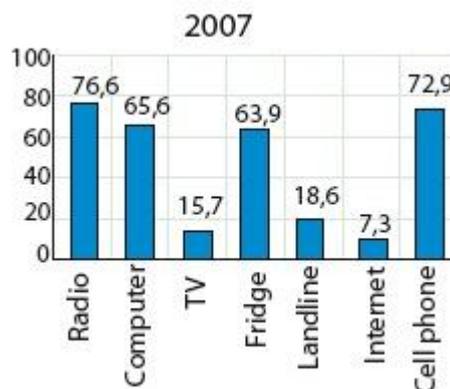
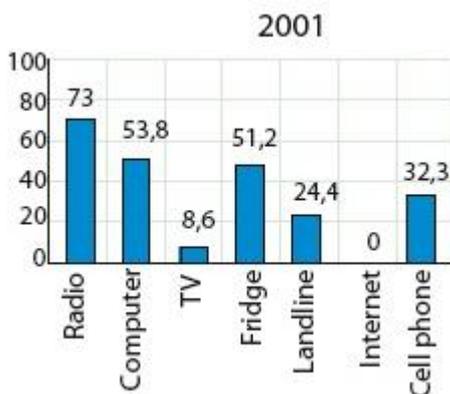
We also look at values in the middle. This is called the average. There are three ways to calculate an average:

- **Median**  
To find the median you first have to order the data from smallest to largest.
  - If the data set has an even number of values, the median is the average of the two middle values.
  - If the data set has an odd number of values, the median is the middle value. The median therefore divides the data set into two equal sized halves. 50% of the data lie below the median and 50% of the data lie above the median.
- **Mode**  
The mode is the number or numbers that appear(s) most often in the data set. If a data set has many modes it is a less useful way to summarise a data set.
- **Mean**  
To find the mean you add up all the values in a data set and then divide by the number of values in the data set

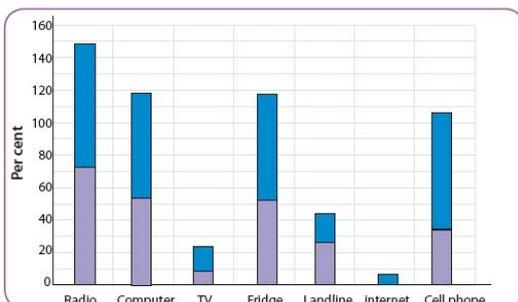
## Types of Graphs

The graphs show how data can be displayed in different ways:

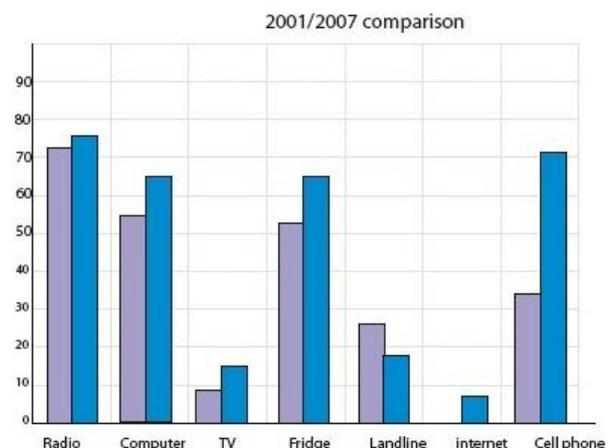
### Bar Graph



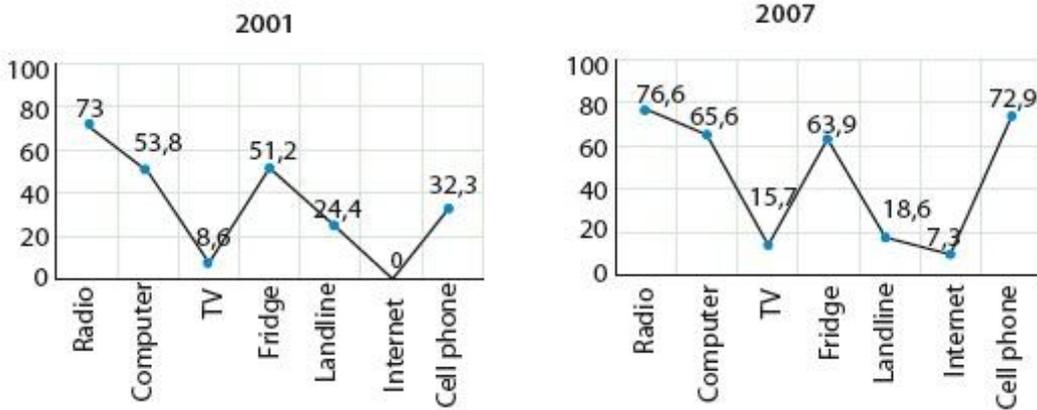
### Compound Bar Graph



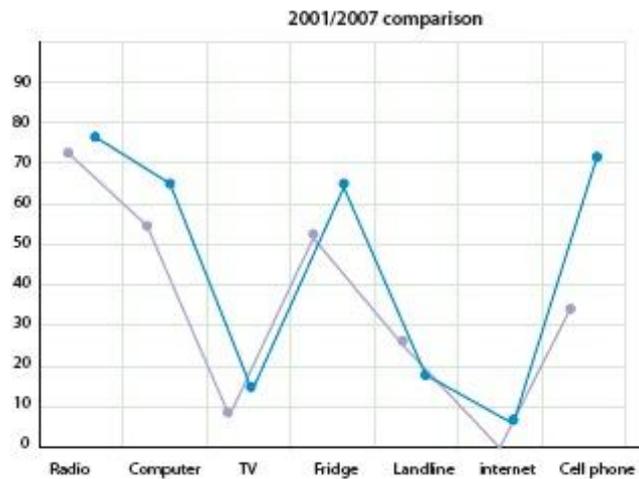
### A Double Bar Graph



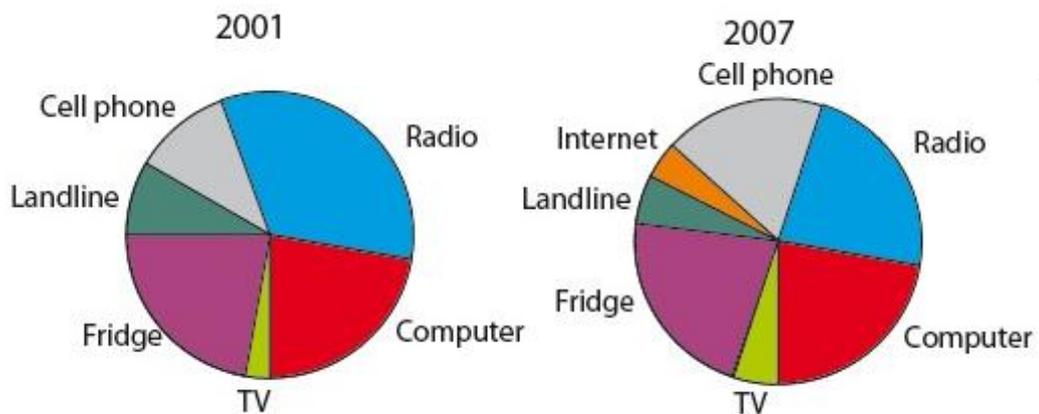
Broken Line Graph



Double Line Graph



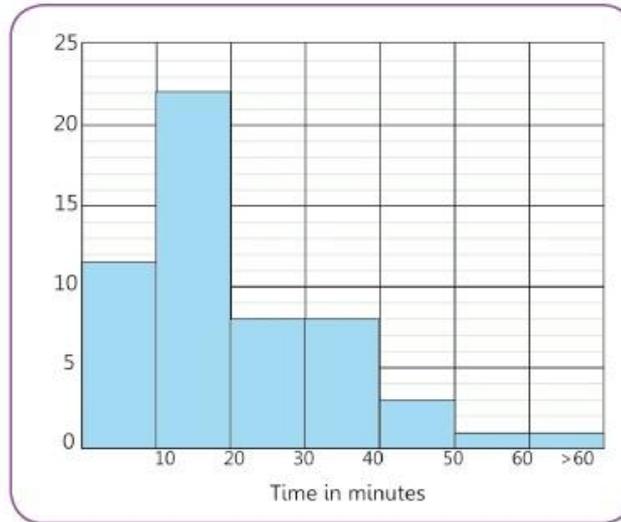
Pie Chart



(Graphs from Solutions for All, Macmillan, Chapter 13, pg 337)

## Histogram

Note this is for different data



(Solutions for All, Macmillan, Chapter 13, pg 340)

## Questions

### Question 1

You are researcher for a marketing company that promotes the following list of new products. What target sample would you select for a survey to get unbiased feedback from potential consumers?

#### 1. Cold drinks

- Children
- Teenagers
- Young Adults
- Adults over 50
- Anyone

#### 2. Sports drinks

- Boys under 20
- Girls under 20
- Young men
- Young Women
- Men over 50
- Women over 50

#### 3. Health tea

- Boys under 20
- Girls under 20
- Young men
- Young Women
- Men over 50
- Women over 50

#### 4. Slimming drinks

- Boys under 20
- Girls under 20
- Young men
- Young Women
- Men over 50
- Women over 50

### Question 2

(Adapted from *Solutions for All: Maths Literacy, Grade 10, Macmillan, Chapter 18, page 335, Question 1*)

A class of 25 learners completed a Maths Literacy test and received the following marks out of 100:

2	74	35	37	67
46	48	70	81	59
49	49	27	96	51
93	63	54	52	98
68	53	87	73	80

- Draw up a frequency table of the test results
- Which class interval has the greatest frequency?
- Can you read the actual marks that learners achieved from the frequency table?
- Would you describe the data collected as discrete or continuous?

### Question 3

(*Solutions for All: Maths Literacy, Grade 11, Macmillan, Chapter 13, page 323, Question 1*)

Cell phone networks wish to research whether there is a connection between gender and the network customers buy their airtime from. A market researcher went to a store in Benoni and did a tally for which network provider girls and boys choose to buy their airtime.

	Cell phone network			
	Blue Hibiscus	Green Cloud	AskTel	MobileUs
Boys				
Girls				

- Draw up a frequency table to summarise the data from the tally table.
- Which is the most popular network overall?
- Which is the most popular network amongst the boys?
- Which is the least popular network amongst the girls?
- How many boys prefer MobileUs to Blue Hibiscus?

### Question 4

A certain Grade 12 Mathematical Literacy class wrote a test on Probability. These were the results:

15 80 75 77 70 68 73 62 60 60 75 61 58 83 75

- How many students are in the class?
- Calculate the range.
- What is the mode?
- Determine the mean average. (Round your answer to one decimal place if necessary)
- Arrange the data in order and go on to show how you would find the median.?
- Which of the averages (mean, mode or median) best describes the set of test results. Explain your reasoning by mentioning why you have decided on a particular average and why you don't think the other two averages are suitable to use when trying to give a full overview of the test results.

### Question 5

Consider the following data about the population in different provinces of South Africa :

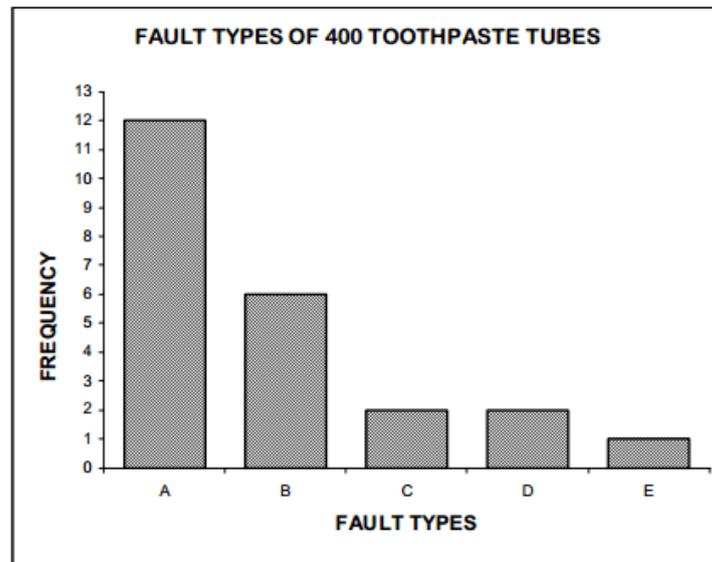
#### Population of South Africa by Province - 1996

Eastern Cape	6 302 525
Free State	2 633 504
Gauteng	7 348 423
KwaZulu Natal	8 417 021
Limpopo	A
Mpumalanga	2 800 711
Northern Cape	840 321
North West	3 354 825
Western Cape	3 956 875

The mean average population for all 9 provinces is 4 509 286. What is the population of Limpopo?

**Question 6**

Mrs Smith, a quality controller for a toothpaste manufacturer, inspected 400 tubes of toothpaste. The number of faults of different types is recorded in the graph below.



- a.) What was the total number of faults found in the 400 tubes of toothpaste? (2)
- b.) The company wants to improve its product by reducing the number of faulty tubes it makes. Which one of the fault types should be fixed to give the greatest improvement? (1)
- c.) A tube of toothpaste is chosen at random from the sample of 400. What is the probability that the following will be chosen?
- i. Type B fault. (2)