MBF 3C1 Name: _____

UNIT 7 SURVIVAL GUIDE: Statistics & Probability

- _____ – the collection, analysis and interpretation of data
- _____ – all members eligible for a survey
- _____ – a part of the population chosen for participation in a survey

SAMPLING TECHNIQUES

→ _____ – the population is divided into clusters and then some clusters are chosen for the survey

→ _____ – members of the population that data is easily collected from

→ _____ – every member of the population has an equal chance of being selected

→ _____ – the sample is made up of subgroups that are proportional to the subgroups in the population

→ _____ – every n^{th} member of the population is chosen

→ _____ – members who have chosen to respond to the survey

BIAS – the prejudice of data collected in a survey

→ _____ – sample does not fairly represent the population

→ _____ – factors in the survey questions produce the result

→ _____ – external factors influence results

→ _____ – results influenced because surveys are not returned

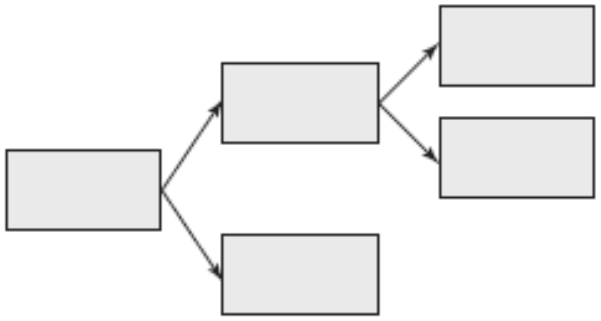
COLLECTING & ORGANIZING ONE-VARIABLE DATA

- _____ gives the measures of 1 attribute
- _____ and _____ are used to organize data

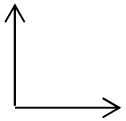
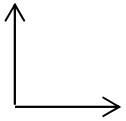
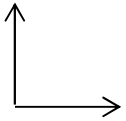
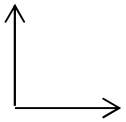
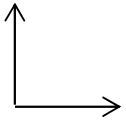
TYPES OF DATA

- _____ – data that is recorded with a label and not a number
  eg. collecting data about eye colour
- _____ – numerical data that does not have values between recorded values (no intervals)
  eg. collecting data about age
- _____ – numerical data where values exist between recorded values (intervals)
  eg. collecting data about height

Eg. Write the words *categorical*, *continuous*, *data*, *discrete*, and *numeric* in the appropriate boxes to show the relationship between types of data.



DISPLAYING DATA

- discrete data can be displayed in _____, _____, and _____
- continuous data can be displayed in _____
- symmetrical distributions:
  → _____ – middle value has the greatest frequency and the rest of the data is symmetrical
  eg.
  
  → _____ – frequencies increase as you move away from the centre of the graph
  eg.
  
  → _____ – all frequencies are approximately equal
  eg.
  
- skewed distributions:
  → _____ – highest frequencies are on the right and decrease to the left
  eg.
  
  → _____ – highest frequencies are on the left and decrease to the right
  eg.
  

MEASURES OF CENTRAL TENDENCY & SPREAD

- _____ – average (total ÷ # of data)
- _____ – middle number of data in numerical order (if there are two, they are averaged)
- _____ – most frequently occurring value
- _____ – spread of data (highest value – lowest value)
- _____ - best measure of spread

TI-83+ Instructions:
1. Press **STAT** and then **1**.
2. Enter the data into L_1 by pressing **ENTER** after each entry.
3. Press **STAT** and cursor right once for **CALC**.
4. Press **1** for 1-Var Stats.
5. Type L_1 by pressing **2nd 1 ENTER**.
6. **Sx =** the sample standard deviation (used when results are to be applied to an entire population, not just the data entered)
   σx = the population standard deviation (used when only data entered should be considered)

Eg. Find the mean, median, mode and range for the set of data:

16 15 17 18 12 16 18
14 11 19 18 10 18 11

- compare sets of data by analysing and interpreting measures of central tendency and spread

THEORETICAL PROBABILITY

- _____ – the chance of something happening written as a fraction, decimal or percent
  eg. games of chance, weather, election results
- _____ – the chance of something happening in the perfect world

$$\frac{\#\text{ of successful attempts}}{\text{total }\#\text{ of attempts}}$$

EXPERIMENTAL PROBABILITY

- _____ – the chance of something happening based on experimental results

$$\frac{\#\text{ of favourable outcomes observed}}{\text{total }\#\text{ of observations}}$$

COMPARE THEORETICAL & EXPERIMENTAL PROBABILITY

THEORETICAL	EXPERIMENTAL
→ uses mathematical theory → quick → when theory exists → gives exact probability	→ perform several trials of an experiment → time consuming → when theory does not exist or is overly complicated → only an estimate of the probability
As the number of trials in an experiment increases, experimental often approaches theoretical.	

Eg. Flip 2 coins.

a. What is the theoretical probability of getting 2 tails? Use a tree diagram.

b. What is the experimental probability of getting 2 tails after 10 trials?

STATISTICS & PROBABILITY IN THE MEDIA

- probability predictions come from the statistical analysis of data
- statistics and probability are used by
  → _____
  → _____
  → _____
- statistics and probability are used to influence decisions, so the following should be considered:
  → _____
  → _____
  → _____

Eg. Explain how the following is misleading.