Module 1 – Activities & Problems

1.1 Which of the following statements is correct regarding observational studies?

(a) A researcher can observe but not control the explanatory variables.
(b) A researcher can define but not observe the explanatory variables.
(c) A researcher can minimise but not eliminate the explanatory variables.
(d) A researcher can control but not observe the explanatory variables.

[NCCA – Student Resources, LC, Q2, pg. 109]

1.2 Some people believe that exercise raises the body's metabolic rate for as long as 12 to 24 hours and thus enables us to continue to burn off fat after we end our workout. In a study of this effect, subjects were asked to walk briskly on a treadmill for several hours. Their metabolic rate was measured before, immediately after and 12 hours after the exercise. Was this study an experiment? Why or why not? What are the explanatory and response variables?

[NCE – MSTL, Q9, Pg 17]

1.3 What type of data is generated by each of the questions in the Census at School Survey?

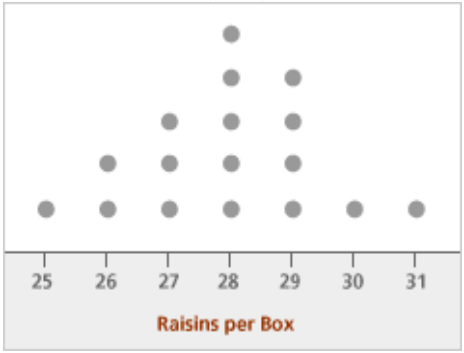
1.4 The Gardai Siochana wants to know how Dublin inner city residents feel about the police service. A questionnaire with several questions about the police is prepared. A sample of 300 mailing addresses in inner city areas is chosen, and a Garda is sent to each address to administer the questionnaire to an adult living there. Identify the population, variables measured and the sample. In addition, describe the potential bias.

[NCE – MSTL, Q2, Pg 16]

1.5 We need to survey a random sample of the 300 passengers on a flight from San Francisco to Tokyo. Name each sampling method described below.

(a) From the boarding list, randomly choose 5 people flying first class and 25 of the other passengers.
(b) Randomly generate 30 seat numbers and survey the passengers who sit there.
(c) Randomly select a seat position (right centre, right window, right aisle etc.) and survey all passengers sitting in those seats.
(d) From the boarding list, select 30 passengers of which 15 are male, 15 females all in the 40 – 50 age bracket.

1.6 Students were investigating the number of raisins contained in individual mini boxes of Sun-Maid raisins.



(i) How many boxes of raisins did they survey?
(ii) What was the modal number of raisins per box?
(iii) What is the median number of raisins per box? Explain how you found this answer.

[NCCA – Student Resources, Q5, LC, pg. 83]

1.7 The amounts of pocket money given to 30, 5th year students per month in € are as follows:

34, 35, 32, 33, 32, 35, 34, 31, 28, 30, 31, 30, 35, 32, 45, 41, 42, 41, 46, 35, 35, 36, 36, 32, 34, 35, 33, 21, 33 & 51.

(a) Represent this data by a Stem and Leaf Plot.
(b) Explain why this type of Data is suitable to be represented by a Stem and Leaf Plot.
(c) How many students received €30 per month as pocket money?
(d) What was the modal amount of pocket money per month?
(e) What was the median amount of pocket money?

1.8 The stem and leaf plot shows the time taken for 15 students to walk to school.

0	5 7 7 8
1	0 0 2 5 6 6 8
2	5 5 5
3	8

Key: 1|6 represents 16 mins.

(a) Find the median time taken.
(b) Find the mode
(c) Find the range
(d) What was the fastest time taken?

1.9 The stem and leaf plot shows the time taken for 16 students to walk to school.

0	5 7 7 8
1	0 0 2 5 6 6 8
2	5 5 5
3	8 9

Key: 2|5 represents 25 mins.

(a) Find the median time taken?
(b) Find the lower quartile.
(c) Find the upper quartile and hence the interquartile range.