



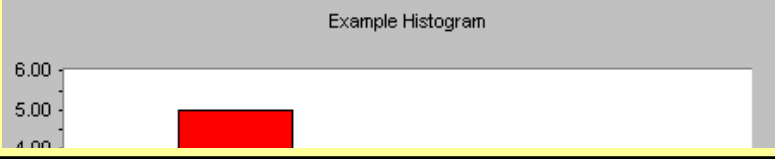
NQF Level: 3

US No: 9012

Assessment Guide

Primary Agriculture

Investigating; using data and probabilities



Assessor:

Workplace / Company:

Commodity: Date:

The availability of this product is due to the financial support of the National Department of Agriculture and the AgriSETA.



Before we start...

This assessment guide contains all necessary activities and instructions that will enable the assessor and learner to gather evidence of the learner's competence as required by the unit standard. This guide was designed to be used by a trained and accredited assessor whom is registered to assess this specific unit standard as per the requirements of the AgriSETA ETQA.

Prior to the delivery of the program the facilitator and assessor must familiarise themselves with content of this guide, as well as the content of the relevant Learner Workbook.

The assessor, facilitator and learner must plan the assessment process together, in order to offer the learner the maximum support, and the opportunity to reflect competence.

The policies and procedures that are required during the application of this assessment are available on the website of the AgriSETA and should be strictly adhered to. The assessor must familiarise him/herself with this document before proceeding.

This guide provides step-by-step instructions for the assessment process of:

Title: Investigate life and work related problems using data and probabilities
US No: 9012 NQF Level: 3 Credits: 5

This unit standard is one of the building blocks in the qualification listed below. Please mark the qualification you are currently assessing, because that will be determined by the context of application:

Title	ID Number	NQF Level	Credits	Mark
National Certificate in Animal Production	49048	3	120	ρ
National Certificate in Plant Production	49052	3	120	ρ

Please mark the learning program you are enrolled in:

Are you enrolled in a:	Y	N
Learnership?	ρ	ρ
Skills Program?	ρ	ρ
Short Course?	ρ	ρ

Please Note:

This Unit Standard **9012** Assessment Guide must be read in conjunction with the generic Assessor Guide as prescribed and published by the AgriSETA.

Note to Assessor:

If you are assessing this module as part of a full qualification or learnership, please ensure that you have familiarized yourself with the content of the qualification.

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SO 1

Instructions to learner:

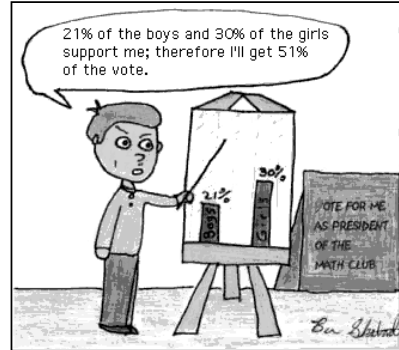
Individual activity

Learner Guide: Page 25 Facilitator Guide: Page 12

- a. You have to design a questionnaire to do a survey at the college. In order to do this you have to do the following:
 - i. Establish the goals of the project – What do you want to learn?
 - ii. Identify your target population. Who are you going to survey? Is it going to be male and female? Is it going to be a specific group of students such as hairdressing, security, engineering? Are you going to survey the lecturing and administrative staff of the college?
 - iii. Determine your sample – Whom will you interview? The first is deciding what kind of people to interview. The next thing to decide is how many people you need to interview.
 - iv. Specification of a sampling frame, a set of items or events that it is possible to measure. What can you measure? Think of attitudes, opinions, age, gender, field of study, height of a person, likes and dislikes, academic qualifications, income level, transport costs to college, etc.
 - v. Specification of sampling method for selecting items or events from the frame. Think of simple random sampling, systematic random sampling, stratified random sampling, cluster sampling. Explain why you chose your method.
 - vi. Sampling and data collecting. How are you going to sample your population. Are you going to use personal or telephonic interviews?
 - vii. Create your questionnaire – What will you ask. Remember to also include the scale you will be using. You have to use the following measuring instruments and scales – such as yes/no
 - viii. (dichotomous) 5 point (Likert), discrete, and continuous variables (e g., temperature)
 - ix. Pre-test the questionnaire, if practical – Test the questions with a few of your class members. What suggestions have they made to you?
 - x. Conduct interviews and enter data – Ask the questions. Record the answers to the questions. If this workbook does not allow you enough space, then you have to use a separate pieces of paper.
 - xi. Analyze the data – Produce the reports. Calculate statistics and probability values through the use of calculators. Represent data in the form of tables, charts and graphs. Use statistics such as mean, median, mode, range,

interquartile and to argue a resolution of an issue. Interpret statistics, and representations of data.

- xii. Review the sampling process. What did you learn from the sampling process? If you had more time and resources what would you have done differently?
- b. Please comment on the statement made in the cartoon to the right. Is the young boy's statement correct? Explain your answer.



- c. Did you hear the one about the politician who promised that, if he was elected, he'd make certain that everybody would have an above average income? Would he be able to do that? Explain why you say so.
- d. The Challenger Disaster

On January 28, 1986 the space shuttle Challenger exploded. Seven astronauts died because two large rubber O-rings leaked during takeoff. These rings had lost their resiliency because of the low temperature at the time of the flight. The air temperature was about 0° Celsius, and the temperature of the O-rings about 6° Celsius below that. The link between O-ring damage and ambient temperature had been established prior to the flight.

The engineers at Morton Thiokol, Inc had recommended that the flight be delayed. Unfortunately their argument wasn't persuasive enough, and the launch proceeded with disastrous consequences. The engineers had failed to display the link between ambient temperature and O- ring damage in a clear and unambiguous fashion.

What was needed was a simple scatterplot. The data is given below. Draw a scatterplot from the data. Based on this graphic, what recommendation would you have made for a flight if the forecast was for below 0° Celsius? Draw a trendline on the scatterplot.

Data from Previous Flights	
Damage Index	Temperature (° C)
14	2
12	4
11	5
10	6
10	7
9	8

6	10
4	11
5	12
4	13
2	19
3	19
0	20
1	21
0	21
1	21
0	21
0	21
0	22
0	23
1	24

Model Answer(s):

a. There is no specific answer to exercise 1. The facilitator/assessor should however ensure that the learner's answers make logical sense. The goals of the project should be specific, measurable and time bound. It should be clear as to who the target population for the survey is going to be. The learner should indicate the approximate size of the target population.

The learner should indicate how many individuals will be included in the sample and what aspects will be measured. After indicating the sampling method, the learner should explain why that particular method was chosen.

The learner should also indicate why he/she chose the particular method of obtaining data. The learner has to use the following measuring instruments and scales at least once in the questionnaire:

- *yes/no (dichotomous)*
- *5 point (Likert),*
- *discrete, and*
- *continuous variables (e.g., temperature)*

The pre-test should include suggestions that others have made to the learner. After conducting the interviews, the learner should include the raw data in the portfolio.

The learner should then analyze the data. This means a report should be produced. The learner should calculate statistics and probability values through the use of calculators. The learner should represent data in the form of tables, charts and graphs. As facilitator/assessor you want to see that the learner used statistics such as mean, median, mode, range, interquartile and to argue a resolution of an issue. In other words the learner should show evidence that he/she interpreted statistics, and representations of data.

The learner should also include a review of the sampling process. The learner must indicate what he/she learnt from the sampling process. The learner must also indicate what he/she would have done differently if he/she had more time and resources.

b. *The boy's statement is wrong. You can't add percentages from two different populations. If you assume that there were the same number of boys and girls in the school you can then add the percentages and then you would have to divide by 2. On this basis the average percentage = $(21 + 30)/2 = 25.5\%$*

c. *Everyone can't have an above average income. The concept of average or otherwise known as the mean is a statistical term indicating central tendency. To achieve this some values will be below and others above that central point.*

My Notes ...

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2

SO 3

Instructions to learner:

Individual activity

Learner Guide: Page 42 Facilitator Guide: Page 14

This exercise lets you simulate playing up to three games of chance at once. The games are organized into three columns. You do not have to input values for all three games every time. If you do not set the probabilities for a game, the applet will ignore that game when it runs.

Two items at the top of the applet let you describe each of three games that can be simulated. You can choose the **type of game**: throwing a die, picking cards from a deck, spinning a spinner, flipping a coin, or another game. In the text boxes below the type of game, describe **what wins**. For example, if the game is flipping a coin, what wins could be "heads."

Note: these boxes have NOTHING to do with the actual calculation! They are for you to record your notes about what is being simulated. In the next section, you yourself have to enter the correct theoretical probabilities based on your analysis.

Under **Theoretical Probabilities**, you must enter the probability as a fraction of winning each game you have described. For instance, if the game was flipping a coin with heads winning, you would expect to win one time for every two tries. So you would enter "1" in the upper box (numerator) and "2" in the lower box (denominator).

To simulate playing the game, choose running the game 20, 40, and then 60 times each. Calculate how many times you could win theoretically.

The results of playing the game are displayed in the **Experimental Probabilities** section.

- a. How did your experimental data compare to your theoretical data?
- b. What can you conclude between running the experiment 20, 40, and 60 times?
- c. List the three games in terms of winning a particular game. Explain why you say so.

Model Answer(s):

Theoretical Probabilities	Die	Coin	Cards
Wins Tries	1 6	1 2	1 12
Show decimal	0.167	0.50	0.083

Experimental Probabilities	Die	Coin	Cards
Wins Tries	10 60	30 60	5 60
Show decimal	0.167	0.50	0.083

- a. The experimental data compares reasonably well to the theoretical data.
- b. The more experiments you do the closer you get to the theoretical probability.
- c. I will play the coin game as there is a 50% probability of getting it right. The other two games have less probability of getting the correct result.

Summative Test and Attitude & Attribute Evaluation

Before the knowledge test is undertaken, the learner must be reminded of what is expected from him / her in terms of summative and reflexive competence. Read and explain to the learner, the **Preparation for Your Final Assessment** section in the learner workbook. Learners and assessor should sign off this section to acknowledge that this step was completed.

Please set up a knowledge test from the questions given as a guideline to learners and supply each learner with a test sheet.

Supply each report with the following heading:

Unit Standard:	9012	NQF Level:	3
Learner Name:			

**Memorandum
To be included in assessors guide**

Question 1:

Andile has the task of finding out what teenagers at his school know about AIDS. He draws up the following questionnaire. Study the questionnaire and answer the questions that follow.

HIV Aids Survey					
We would like to find out more about the knowledge of HIV AIDS amongst learners in our school.. Please help us by answering the questions. From question 2 onwards, please mark answers with a cross.					
1. What is your age?					
2. What population group do you belong to?	African	Asian	White	Other	
3. Do you, the educated learner, live in an urban area?	Yes	No			
4. Can you get AIDS by touching someone?	Yes	No	Don't know		
5. Do you talk about AIDS and HIV to your friends?	1 Frequently	2 Often	3 Sometimes	4 Seldom	5 Never
6. Do you discuss AIDS and HIV at home?	1 Frequently	2 Often	3 Sometimes	4 Seldom	5 Never
7. What do you think about the use of condoms?					

- Which are open-ended questions? 1 and 7
- What information do answers to questions 1-3 provide?
Demographic – to give an indication of the type of people sampled
Which question is biased? 3 How should the question have been phrased to produce more reliable results? *Any answer acceptable here as long as bias has been eliminated*
- What kind of scale is used in question 3? *dicotomous*
- What kind of scale is used in questions 5 and 6? *5 point / Likert*
- Design 2 more questions for this questionnaire.
Any reasonable answers acceptable here. Questions must be unbiased and must be phrased in an acceptable manner with some form of scale

Question 2:

A Maths test out of 10 marks was given to learners. The learner's results are listed below

4; 2; 6; 3; 7; 9; 6; 7; 5; 1; 9; 8; 3; 8; 7; 6; 5; 7; 4; 5; 7; 8; 5; 7; 2; 10; 7; 8; 5; 7; 8; 4

1. Calculate the mean

Total = 176

No. of learners = 32

Mean = 176 / 32 = 5,5

2. Rearrange the test scores from smallest to biggest

1; 2; 2; 3; 3; 4; 4; 4; 5; 5; 5; 5; 5; 6; 6; 6; 7; 7; 7; 7; 7; 7; 7; 7; 8; 8; 8; 8; 8; 9; 9; 10

3. Find the median

6,5

4. Find the mode

7

5. Find the first quartile

4,5

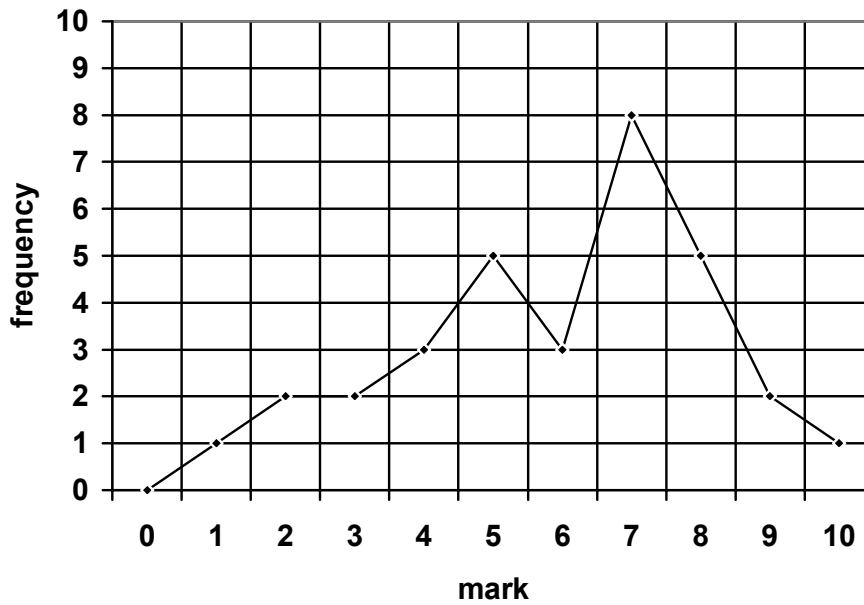
6. Find the third quartile

7,5

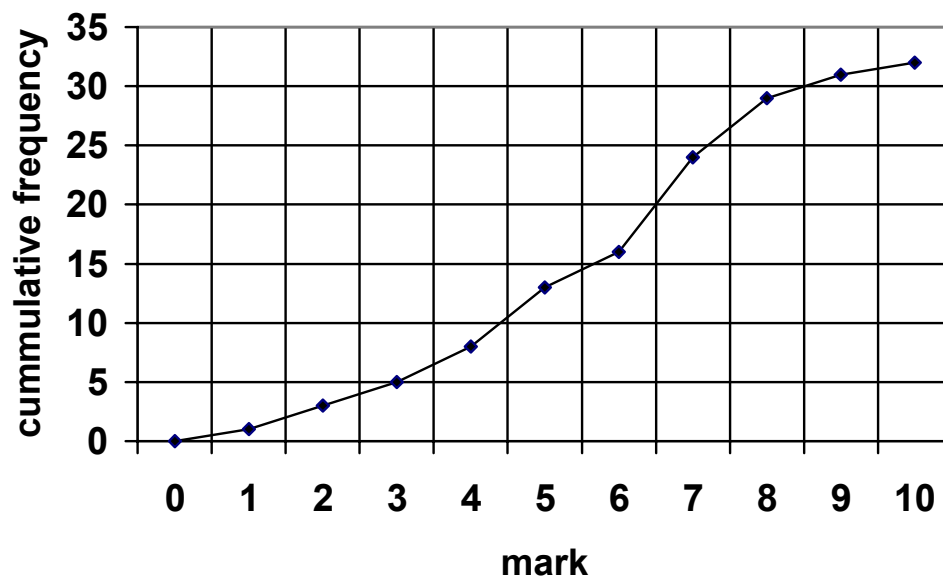
7. Complete the table below

mark	frequency	Cumulative frequency
0	<u>0</u>	<u>0</u>
1	<u>1</u>	<u>1</u>
2	<u>2</u>	<u>3</u>
3	<u>2</u>	<u>5</u>
4	<u>3</u>	<u>8</u>
5	<u>5</u>	<u>13</u>
6	<u>3</u>	<u>16</u>
7	<u>8</u>	<u>24</u>
8	<u>5</u>	<u>29</u>
9	<u>2</u>	<u>31</u>
10	<u>1</u>	<u>32</u>
Total	<u>32</u>	

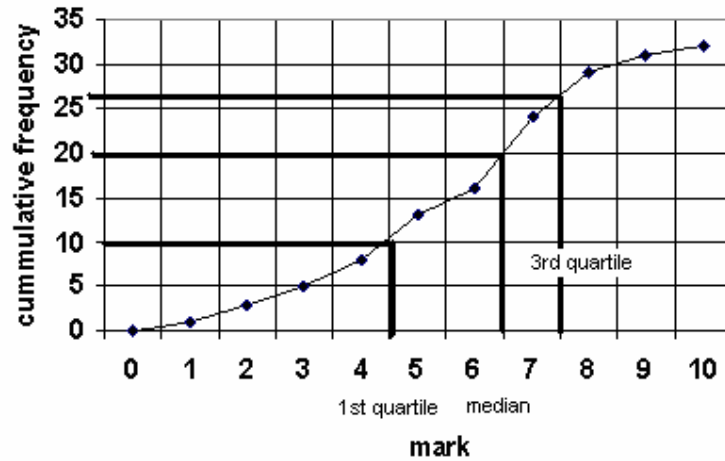
8. Construct a line graph for the data in your table



9. Construct a cumulative frequency graph (ogive) for the data



10. On your graph in question 9 indicate clearly where you would find the 1st quartile, the median and the 3rd quartile.



11. Was the test a fair one? Make a comment based on the shape of the graphs in questions 8 and 9.
Yes, ogive has flattened s-shape. Frequency graph basically follows bell curve.

Question 3:

Andile now has to distribute the questionnaires amongst the learners.

- Describe how he would obtain a random sample throughout the school
Assign a number to each learner in the school, then draw random numbers by acceptable means and give questionnaire to the selected learners.
- Describe what he should do to obtain a stratified sample throughout the school
Give questionnaires to a certain number of learners in each grade, according to random principles
- Explain why a stratified sample would be better than a random sample.
Learners in different age groups may have different responses

Assessment Feedback Form

Comments / Remarks	
<p>Feedback to learner on assessment and / or overall recommendations and action plan for competence:</p>	
<p>Feedback from learner to assessor:</p>	
<p>Assessment Judgement You have been found:</p> <p><input type="radio"/> Competent</p> <p><input type="radio"/> Not yet competent in this unit standard</p>	<p>Actions to follow:</p> <p><input type="radio"/> Assessor report to ETQA</p> <p><input type="radio"/> Learner results and attendance certification issued</p>
<p>Learner's Signature:</p>	<p>Date:</p>
<p>Assessor's Signature:</p>	<p>Date:</p>
<p>Moderator's Signature:</p>	<p>Date:</p>