



NQF Level: 4

US No: 9015

Assessment Guide

Primary Agriculture

Knowledge of statistics and probability



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.



agriculture

Department:
Agriculture
REPUBLIC OF SOUTH AFRICA



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:	Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems		
US No:	9015	NQF Level:	4
		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	48979	4	120	<input type="checkbox"/>
National Certificate in Plant Production	49009	4	120	<input type="checkbox"/>

Please mark the learning program you are enrolled in:

Are you enrolled in a:	Y	N
Learnership?	<input type="checkbox"/>	<input type="checkbox"/>
Skills Program?	<input type="checkbox"/>	<input type="checkbox"/>
Short Course?	<input type="checkbox"/>	<input type="checkbox"/>

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.

1

SO 1

Instructions to learner:

Individual questionnaire

Learner Guide: Page 11 Facilitator Guide: Page 12

Below is a questionnaire provided by a restaurant in Nelspruit to see if the service is good enough. Study the questionnaire and answer the questions:

How is our service? Please take a few minutes to complete our survey. Mark your response with a cross					
1. Your age	1 Below 20 years	2 20-30 years	3 30-40 years	4 40-50 years	5 Older than 50 years
2. Your gender	Male	Female			
3. Where do you live?	1 In Nelspruit	2 Within 10 km of Nelspruit	3 10 to 20 km from Nelspruit	4 20 to 30 km from Nelspruit	5 More than 30 km from Nelspruit
4. How often do you visit a restaurant?	1 More than once a week	2 Once a week	3 Once a month	4 A few times a year	5 Hardly ever
5. How friendly are out waiters?	1 Excellent	2	3	4	5 Poor
6. How quickly did you get served?	1 Excellent	2	3	4	5 Poor
7. Appearance of your meal	1 Excellent	2	3	4	5 Poor
8. Quality of the food	1 Excellent	2	3	4	5 Poor
9. What did you like best about your visit to our restaurant?					

1. What kind of information do questions 1-4 provide?
2. Why do you think the restaurant included question 3?
3. Why is question 4 important?
4. What other question could be included in this category?
5. Which questions are
 - a. closed
 - b. open ended?
6. In question 7 why was "excellent" listed as the first choice and not the last?

- Model Answer(s):**
- 1 *What kind of information do questions 1-4 provide?*
Demographic informatn
 - 2 *Why do you think the restaurant included question 3?*
To find out how many people are close enough to visit the restaurant again/more often
 - 3 *Why is question 4 important?*
If people do not regularly visit restaurants, it does not matter how good a restaurant is: it will not draw them
 - 4 *What other question could be included in this category?*
Any reasonable answer acceptable here. The purpose is to make kearners think of appropriate questions e.g what do yu think of the décor? Or Are the bathrooms clean? Or Are waiters well-mannered?
 - 5 *Which questions are:*
 a) *closed 1-8*
 b) *open ended? 9*
 - 6 *In question 7 why was "excellent" listed as the first choice and not the last?*
If the first word people read is "excellent" it puts them in a more positive frame of mind. If they see "poor" first, then it puts them in a negative frame of mind. Thus the very order of the choices on the questionnaire introduces a subconscious bias.

My Notes ...

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

2

SO 1

Instructions to learner:

Individual written assignment

Learner Guide: Page 12 Facilitator Guide: Page 12

Farmer Brown currently uses SuperDip to ensure that his cattle is free of parasites. A rep has given him a free sample of ParaDip to try. Farmer Brown decides to do a trial to see which dip works better. He decides to divide his cattle into three groups. Group 1 will receive no dip at all, Group 2 will be dipped with SuperDip and Group 3 will be treated with ParaDip. After a week he will stick a piece of clear tape onto the fur on the neck. The tape will be removed quickly so that the parasites adhere to the tape. The number of parasites on the tape will then be counted under the microscope.

- Name the independent variable in this investigation.
- Name the dependent variable in this investigation.
- List three controlled variables.
- Why would Farmer Brown include a group of undipped cattle in his experiment?
- Farmer Brown has more than 4000 cattle. He does not have the time or the money to count the parasites on 4000 strips of tape. Suggest a way in which he can get reliable results at a minimum of time and money.

Model Answer(s):

- Type of dip used*
- Number of parasites on the sticky tape*
- Cattle type, size, dip frequency, must use the same dip tank, the place on the neck where the tape is attached must be the same in all cattle, size of tape used must be the same etc*
- The undipped cattle serve as a control. In this way he can see if the two dips are effective at all.*
- He can decide to treat only 40 cattle per group. He would have to chose the cattle to be analysed randomly. He would then have a $40/4000 \times 100 = 1\%$ representative sample.*

Learners must get to the conclusion that he does not have to test each animal, but take a representative sample

3

SO 1

Instructions to learner:

Answer the questions

Learner Guide: Page 13 Facilitator Guide: Page 12

- a. What kind of training does Farmer Rose need to give his staff?
- b. What kind of training does Farmer Brown need to give his staff?
- c. What kind of information does each farmer need to give to his workers?

Model Answer(s):

- a. *He needs to tell them why he is doing the study. He then needs to make sure that the staff know that the plots must be treated exactly the same, i.e. same water regime, same pesticide control, etc.*
- b. *How to dip cattle correctly, which cattle must receive high dip (they obviously have to be marked in some way) how to apply tape etc*
- c. *He needs to make sure they understand why the study is being done and how it is to be done.*

My Notes ...

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

4

SO 1

Instructions to learner:

Complete the table

Learner Guide: Page 17 Facilitator Guide: Page 12

Complete the table below. Make sure that you summarise the information.

	Observation	Personal Interview	Self-enumeration
What is it?			
Example (only one needed)			
Advantages			
Disadvantages			

Model Answer(s):

This comes straight from the text.

The assessor must judge learners understanding by the way this summary has been completed.

5

SO 2

Instructions to learner:

Individual assignment

Learner Guide: Page 24 Facilitator Guide: Page 13

1. At a college 180 learners were interviewed regarding their alcohol drinking habits.

a) Complete the table below.

	Learners who do not drink	Male learners who drink	Female learners who drink	Total
Percentage				
Number of learners	110	40	30	180
Degrees				

b. Construct a pie chart to reflect the data

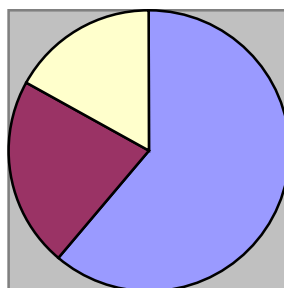
Model Answer(s):

1

a)

	<i>Learners who do not drink</i>	<i>Male learners who drink</i>	<i>Female learners who drink</i>	<i>Total</i>
<i>Percentage</i>	<i>61,1%</i>	<i>22,2%</i>	<i>16,7%</i>	<i>100%</i>
<i>Number of learners</i>	<i>110</i>	<i>40</i>	<i>30</i>	<i>180</i>
<i>Degrees</i>	<i>220°</i>	<i>80°</i>	<i>60°</i>	<i>360°</i>

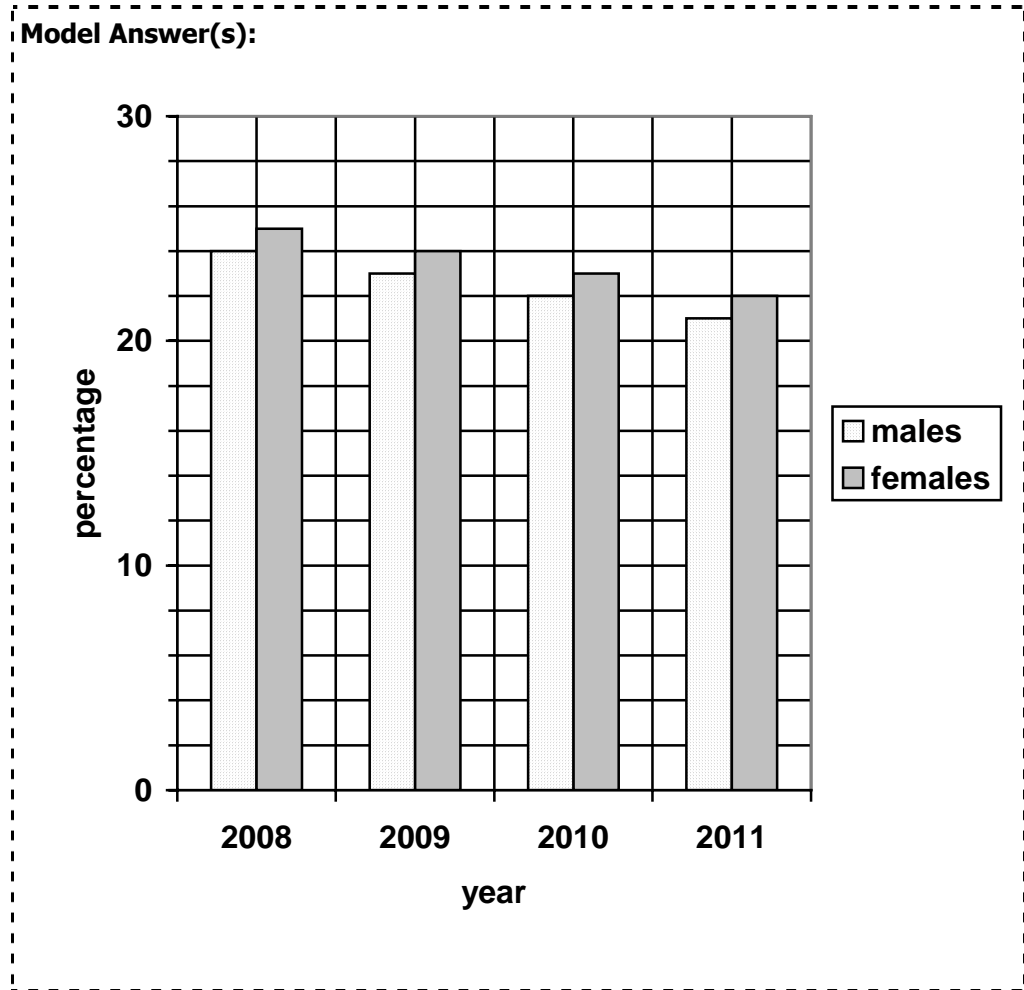
b)



2. Below is a table showing predicted % of males and females infected with HIV between 2008 and 2011.

	2008	2009	2010	2011
Adult males (20-65)	24%	23%	22%	21%
Adult females (20 – 65)	25%	24%	23%	22%

- a. Draw a double bar chart to show the prevalence of HIV in males and females between 2008 and 2011.



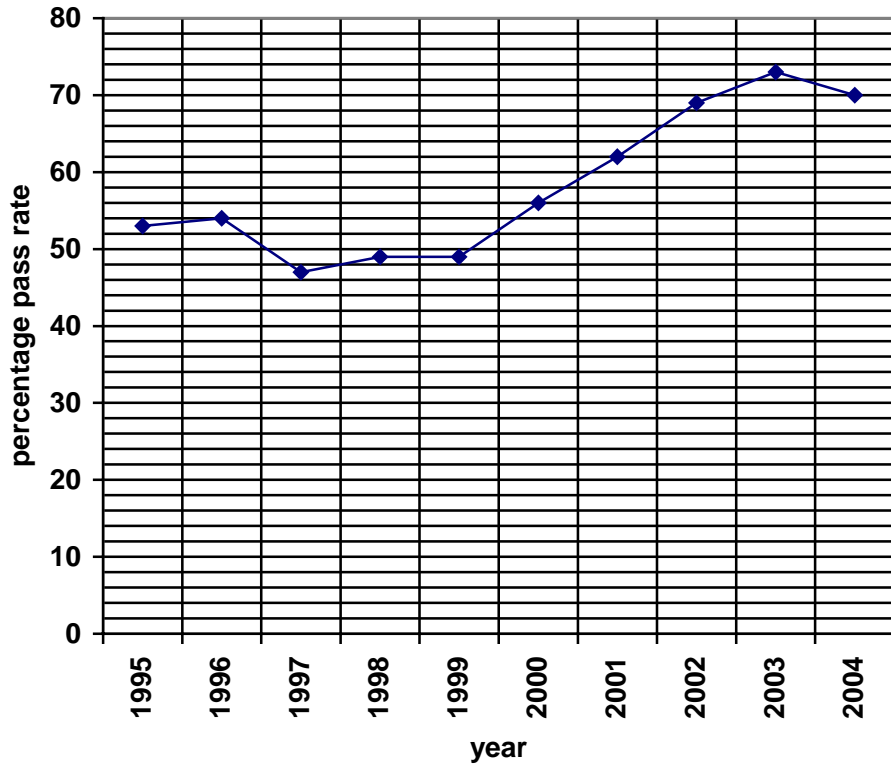
3. The table below shows the matric pass rates from 1995 - 2004

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Pass rate (%)	53	54	47	49	49	56	62	69	73	70

- Calculate the mean pass rate for the time period 1995 – 2004
- Construct a line graph to show how the matric pass rate has changed.
- Write a paragraph describing the changes that have occurred in the matric pass rate. Use your line graph as a guide.
- Give an explanation for the increase in pass rates from 1998 to 2003.

Model Answer(s):

- a) Total = 582
Mean = $582/10 = 58,2\%$
- b)



- c) *Between 1995 and 1997 the pass rate dropped from 53% to 47%. In 1998 the pass rate increased slightly to 49% and remained there in 1999. From 1998 the pass rate increased steadily to 73% in 2003. In 2004 the pass rate dropped to 70%.*
- d) *Education in less privileged schools improved.*

My Notes ...

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

6

SO 2

Instructions to learner:

Complete

Learner Guide: Page 27 Facilitator Guide: Page 13

1. Farmers were interviewed to find out how many times they had to call out the local vet over the last 12 months. The data are listed below.

1; 2; 6; 0; 3; 2; 3; 2; 1; 0; 1; 5; 4; ; 0; 3; ; 2; 4; 0; 3; 1; 0; 2; 0; 2; 1; 0; 1; 0; 3; 4; 1; 1; 0; 1; 1; 2; 2; 5

- Arrange the data in order
- Calculate the mean
- Find the median
- What is the mode?
- Calculate the range

Model Answer(s):

- 0; 0; 0; 0; 0; 0; 0; 0; 0; 0; 1; 1; 1; 1; 1; 1; 1; 1; 1; 1; 1; 1; 2; 2; 2; 2; 2; 2; 2; 2; 3; 3; 3; 3; 3; 3; 4; 4; 4; 5; 5; 6
- Total = 71 Number of samples = 40
Mean = $71/40 = 1,78$
- 2
- 1
- $6 - 0 = 6$

2. The frequency distribution of the amounts of bonus pay earned during the last year for 65 salespersons follows:

Amount of Bonus Pay	Number of Salespersons	Total amount paid to this salary bracket
0 – under 100	4	50x4 = 200
100 – under 200	17	
200 – under 400	27	
400 – under 600	11	
600 – under 1000	5	
1000 – under 2000	1	
Total	65	

- Complete the table above
- Calculate the mean amount of bonus pay per employee.
- What is the approximate total amount of bonuses paid to all salespersons? Why is this an approximation?

d. Draw a histogram of the data.

Model Answer(s):

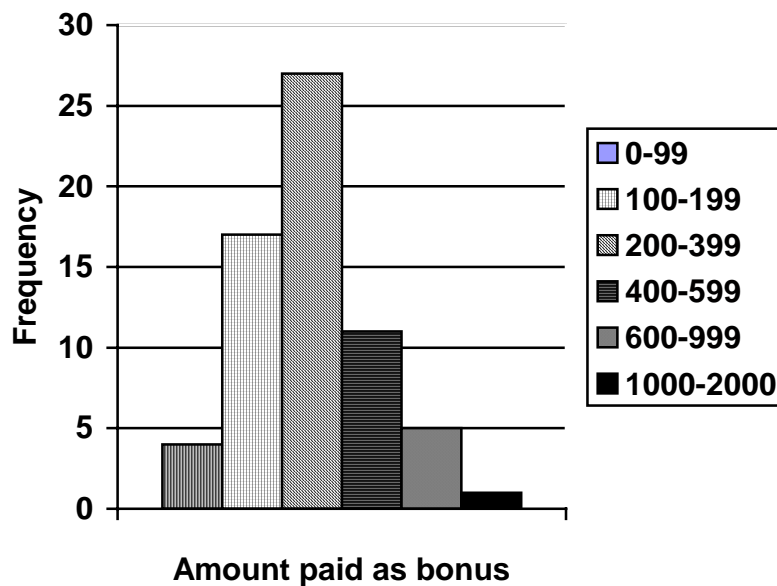
a.

<i>Amount of Bonus Pay</i>	<i>Number of Salespersons</i>	<i>Total amount paid to this salary bracket</i>
<i>0 – under 100</i>	<i>4</i>	<i>50x4 = 200</i>
<i>100 – under 200</i>	<i>17</i>	<i>2550</i>
<i>200 – under 400</i>	<i>27</i>	<i>8100</i>
<i>400 – under 600</i>	<i>11</i>	<i>5500</i>
<i>600 – under 1000</i>	<i>5</i>	<i>4000</i>
<i>1000 – under 2000</i>	<i>1</i>	<i>1500</i>
<i>Total</i>	<i>65</i>	<i>21850</i>

b. $21850/65 = 336,15$

c. R21 850. We do not know exact salaries, so we have taken midpoint of class as approximation

d.



My Notes ...

.....

.....

.....

.....

.....

.....

.....

.....

7

SO 2

Instructions to learner:

Individual written assignment

Learner Guide: Page 29 Facilitator Guide: Page 13

1. Below are the same data gathered regarding vet visits to farms. This time the data have been arranged in order.

0; 0; 0; 0; 0; 0; 0; 0; 0; 0; 1; 1; 1; 1; 1; 1; 1; 1; 1; 1; 1; 1; 2; 2; 2; 2; 2; 2; 2; 2; 3; 3; 3; 3; 4; 4; 4; 5; 5; 6

Find the following:

- a. the second quartile
- b. the first quartile
- c. the third quartile
- d. the inter-quartile range

Model Answer(s):

- a. *Median lies between 20th and 21st data item, i.e. 1*
- b. *1st quartile lies between 10th and 11th data item, i.e. 1*
- c. *3rd quartile lies between 30th and 31st data items, i.e. 3*
- d. *Inter-quartile range = 3 - 1 = 2*

My Notes ...

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

8

SO 2

Instructions to learner:

Answer the questions

Learner Guide: Page 34 Facilitator Guide: Page 14

- Farmer Black has breeds his own cattle for meat. He would like to build an abbatoir on his farm, so that he can slaughter the meat himself. There is only one butcher shops in the area, and farmer Black needs to find out if it is worth selling his meat there. He did a survey to see how many residents visit either shop. The results are set out below as frequency tables.

Butcher shop A	No. of visits	0	1	2	3	4	5	6	7	8
	Frequency	3	13	12	6	7	2	1	0	1
	Cumulative frequency									

- Complete the table above by working out the cumulative frequencies.

Calculate the following values: (make sure that you show all your working.

- median.
- 1st quartile
- 3rd quartile
- Range
- Inter-quartile range

Model Answer(s):

a)

Butcher shop A	No. of visits	0	1	2	3	4	5	6	7	8
	Frequency	3	13	12	6	7	2	1	0	1
	Cumulative frequency	3	16	28	34	41	43	44	44	45

b. *median.*

$$(45+1)/2 = 23. \text{ Median is } 23^{\text{rd}} \text{ value. Thus median} = 2$$

c. *1st quartile*

$$(45+1)/4 = 11,5. \text{ 1st quartile lies between items 11 and 12. It is } 1.$$

d. *3rd quartile*

$$3(45+1)/4 = 34,5. \text{ 3rd quartile lies between items 34 and 35. It is } 3,5$$

e. *Range*

$$8-0=8$$

f. *Inter-quartile range*

$$3,5 - 1 = 2,5$$

- Average weekly wages and salaries (in Rands) in 60 rural areas of South Africa are:

300	285	270	302	308	295	304	312	270	280
310	260	274	306	312	285	306	316	302	290
290	310	278	308	316	275	294	320	306	300
298	320	280	320	320	265	298	302	308	270
296	266	285	325	302	262	300	294	320	310
306	268	286	315	294	296	310	290	325	305

- a. Construct a frequency distribution of these data using equal class intervals of 40.

Frequency table:

Classes	Class Mark	Frequency
290 – 329	310	
330 – 369	350	
370 – 409	390	
410 – 449	430	
450 – 489	470	
490 - 529	510	
Total		60

- b. What is the mean weekly wage?
 c. What is the median weekly wage?
 d. What is the mode of the weekly wage?
 e. What is the value of the first quartile of weekly wages?

Model Answer(s):

(a) Frequency table:

Classes	Class Mark	Frequency
290 – 329	310	9
330 – 369	350	4
370 – 409	390	23
410 – 449	430	10
450 – 489	470	5
490 - 529	510	9
Total		60

- (b) Mean = 402.17
 (c) Median = 399
 (d) Mode = 370
 (e) 1st Quartile = 370

9

SO 2

Instructions to learner:

Individual assignment

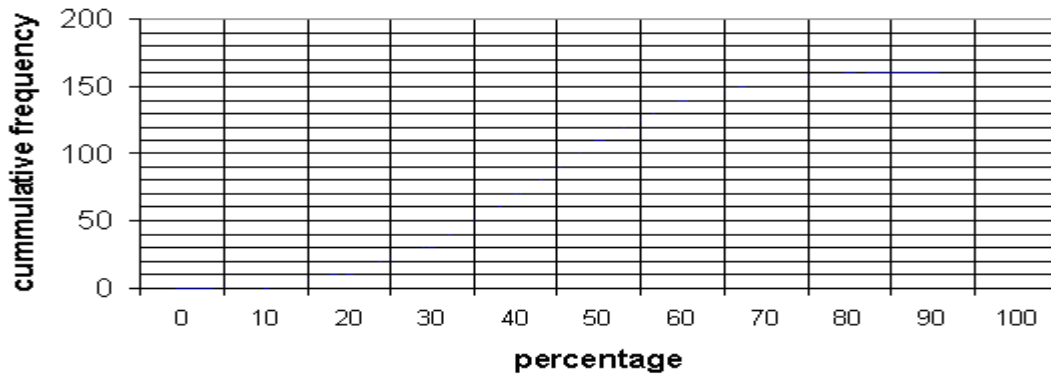
Learner Guide: Page 35 Facilitator Guide: Page 14

1. A lecturer wanted to see if his Maths examination was well structured. He analysed the students results and drew up a frequency table.

Percentage	Number of learners	Cumulative frequency
1-10	0	
11-20	2	
21-30	11	
31-40	19	
41-50	36	
51-60	42	
61-70	31	
71-80	13	
81-90	5	
91-100	1	

- Complete the table.
- Draw an ogive on the grid provided.

Ogive of learners percentage in a Maths exam



- Use the graph to find the median.
- Find the 1st and 3rd quartile using the graph
- Is the examination well structured? Give a reason for your answer

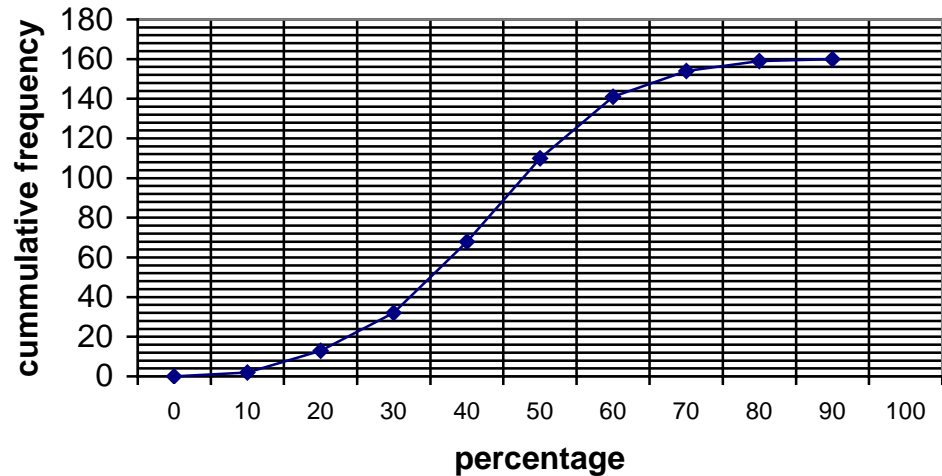
Model Answer(s):

a) Complete the table.

Percentage	Number of learners	Cummulative frequency
1-10	0	0
11-20	2	2
21-30	11	13
31-40	19	32
41-50	36	68
51-60	42	110
61-70	31	141
71-80	13	154
81-90	5	159
91-100	1	160

b) Draw an ogive on the grid provided.

Ogive of learners percentage in a Maths exam



c) Use the graph to find the median.

42%

d) Find the 1st and 3rd quartile using the graph

1st quartile: $(160 + 1)/4 = 40,25$ 1st quartile = 31%

3rd quartile: $3(160 + 1)/4 = 120,75$ 3rd quartile = 52%

e) Is the examination well structured? Give a reason for your answer

Yes, the ogive has a stretched out s-shape, meaning that results are well clustered around the middle value.

My Notes ...

.....

.....

.....

.....

10

SO 2

Instructions to learner:

Complete

Learner Guide: Page 35 Facilitator Guide: Page 14

1. A farmer plants sugar cane and mieles on his farm. He has collected data regarding the yield that he has obtained each year for the past 10 years. He has calculated the variance and the standard deviation for each of the data sets:

	Variance	Standard deviation
Sugar cane	14	3,74
Mielies	28	5,29

- a. What do these numbers tell you about the spread of the data?
- b. Which is the more reliable crop? Justify your answer.

Model Answer(s):

- a. *There was less variation in the sugar cane crop over the last 10 years than the mielie crop.*
- b. *Sugar cane seems to be the more reliable crop as there was less variation in yield over the last 10 years.*

2. A soccer team has two excellent players: Seboko and Surprise. The coach has placed Seboko on the team and has left Surprise off. Naturally, Surprise is annoyed. His father advises him to analyse the goals scored by both players in the matches of the last season. Surprise collects the data:

	Surprise		
	Goals scored	Deviation from the mean	(Deviation) ²
	1		
	2		
	4		
	4		
	3		
	0		
	2		
	1		
	2		
	1		
Total	20		
mean			
variance			
Std Deviation			

	Seboko		
	Goals scored	Deviation from the mean	(Deviation) ²
	0		
	4		
	1		
	5		
	2		
	0		
	3		
	0		
	5		
	0		
Total	20		
mean			
variance			
Std Deviation			

- a. Complete the table above to calculate the variance and standard deviation for each player.

- Both players scored the same mean number of goals over the last 10 matches, yet Surprise is the better player. Explain why this is so.
- Suggest a reason why the coach chose Seboko over Surprise.
- Suggest a way in which Surprise could handle the situation when he speaks to the coach

Model Answer(s):

a.

	Surprise		
	Goals scored	Deviation from the mean	(Deviation) ²
	1	1	1
	2	0	0
	4	-2	4
	4	-2	4
	3	-1	1
	0	2	4
	2	0	0
	1	1	1
	2	0	0
	1	1	1
	2	0	0
	1	1	1
Total	20		16
mean	2		1,6
variance			1,6
Std Deviation			1,26

	Seboko		
	Goals scored	Deviation from the mean	(Deviation) ²
	0	1	1
	4	-2	4
	1	1	1
	5	-3	9
	2	0	0
	0	2	4
	3	-1	1
	0	2	4
	5	-3	9
	0	2	4
	20		37
	2		3,7
			3,7
			1,9

- Both players are good, but Surprise is the more reliable player, as his goal scoring is more consistent in each match. His variance and standard deviation are lower than those of Seboko.
- Answers here will vary widely.
It could be that the coach is blinded by the high numbers of goals that Seboko scored in some matches.
It could be that Surprise is known to have a temper and commits more fouls per match than Seboko
It could be that the coach has seen that Surprise has slacked off in his training
Any other valid answer is acceptable.
- Surprise should draw up the data in a neat fashion and politely present them to the coach. He should then ask the coach what the reason is that Seboko was chosen over him. When the coach gives him a reason, or points out a weakness in Surprise, he should take careful note and try very hard to improve. The coach has the final say and Surprise should remain calm and polite.

My Notes ...

.....

.....

.....

11

SO 2

Instructions to learner:

Individual assignment

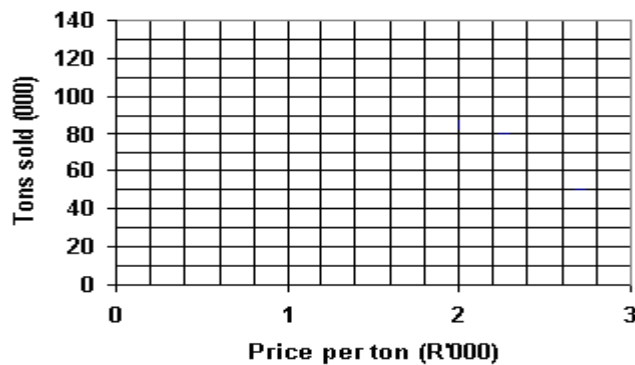
Learner Guide: Page 41 Facilitator Guide: Page 14

A commodities trader contacted a supplier of sunflower to learn about demand. The supplier provided the average price per ton (in R'000) and the number of tons sold in '000s of tons for an eight-year period. The data are as follows:

Price per ton (R'000)	Tons sold (000)
1.25	125
1.75	105
2.25	65
2.00	85
2.50	75
2.25	80
2.70	50
2.50	55

- a. Draw a scatterplot of the data.

Price per ton of sunflower against tons sold

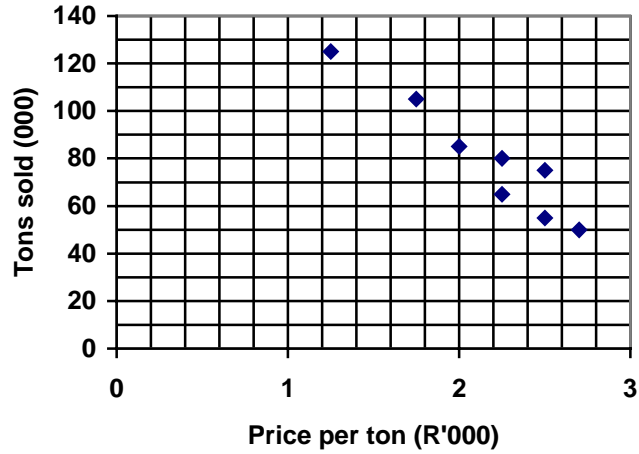


- b. Do the points follow a pattern? Explain
- c. Which of the following options is correct?"
- i) $r > 0$ ii) $r < 0$ iii) $r = 0$
- d. Describe the relationship in words.

Model Answer(s):

(a)

Price per ton of sunflower against tons sold



(b) *The relationship seems to be linear, with the correlation being negative.*

(c) *ii) $r < 0$*

(d) *As the price per ton increases less gets sold.*

My Notes ...

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Instructions to learner:

Individual assignment

Learner Guide: Page 50 Facilitator Guide: Page 16

1. A vending machine at a college has the following items on sale: cool drink, chocolates, crisps and chewing gum. A survey showed that customers would have the following preferences:

- Crisps: $\frac{1}{4}$
 - Cool drink: $\frac{1}{2}$
 - Chewing gum: $\frac{1}{20}$
 - Chocolate: $\frac{1}{5}$
- a. Convert all fractions to a percentage.
 - b. Which is the most popular item?
 - c. Which is the least popular item?

Model Answer(s):

- a. *Crisps: $\frac{1}{4} \times 100 = 25\%$
Cool drink: $\frac{1}{2} \times 100 = 50\%$
Chewing gum: $\frac{1}{20} \times 100 = 5\%$
Chocolate: $\frac{1}{5} \times 100 = 20\%$*
- b. *Cool drink*
- c. *Chewing gum*

2. Clive has 2 pairs of yellow socks, 3 pairs of red socks, 4 pairs of black socks and 6 pairs of white socks in his sock drawer. There is a power failure while he is getting dressed and he cannot see which colour socks he is putting on.

- a. What is the probability that he will put on red socks?
- b. What is the probability that he will put on yellow socks?
- c. What is the probability that he will put on white socks?
- d. What is the probability that he will put on black socks?

Model Answer(s):

- a. $\frac{3}{15} = \frac{1}{5}$
- b. $\frac{2}{15}$
- c. $\frac{6}{15} = \frac{2}{5}$
- d. $\frac{4}{15}$

Instructions to learner:

Answer the questions

Learner Guide: Page 52 Facilitator Guide: Page 16

1. Sandile has 3 plastic forks, 5 metal forks, 4 plastic knives and 6 metal knives in his cutlery drawer.
What is the probability that he will grab a plastic fork and a plastic knife from the drawer if he is not looking?
2. The probability of a woman having a baby boy is 50% and that of having a girl is also 50% What is the probability that a woman who has three children will have three boys?
3. Lebo has 3 blue pens, 2 red pens, 5 black pens and 2 pencils in his pencil case.
 - a. What is the probability that he takes a black pen?
 - b. What is the probability that he takes an item that is not a black pen?
4. One card is drawn from a deck of 52 cards. What is the probability that the card will be
 - a. red or an ace?
 - b. a king of hearts?

Model Answer(s):

1. $P(\text{plastic fork}) = \frac{3}{8}$
 $P(\text{plastic knife}) = \frac{4}{10} = \frac{2}{5}$
 $P(\text{plastic knife and fork}) = \frac{3}{8} \times \frac{2}{5} = \frac{3}{20}$
2. $P(\text{boy}) = \frac{1}{2}$
 $P(3 \text{ boys}) = \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8}$
- 3a) $P(\text{black}) = \frac{5}{12}$
- b. $P(\text{not black}) = 1 - \frac{5}{12} = \frac{7}{12}$
- 4a) $P(\text{red}) = \frac{26}{52}$
 $P(\text{ace}) = \frac{4}{52}$
 $P(\text{red and ace}) = \frac{(26 + 4)}{52}$
 $P(\text{red and ace}) = P(\text{red}) + P(\text{ace}) - P(\text{red + ace})$
 $= \frac{26}{52} + \frac{4}{52} - \frac{1}{52} = \frac{23}{52}$
- b) $\frac{1}{52}$

My Notes ...

.....

.....

.....

Instructions to learner:

Individual written assignment

Learner Guide: Page 62 Facilitator Guide: Page 16

- 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."

Type of Game:	<input type="text" value="Die"/>	<input type="text" value="Coin"/>	<input type="text" value="Cards"/>
What Wins:	<input type="text"/>	<input type="text"/>	<input type="text"/>

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).

Theoretical Probabilities

Wins	<input type="text"/>	<input type="text"/>	<input type="text"/>
Tries	<input type="text"/>	<input type="text"/>	<input type="text"/>
Show decimal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 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.

Experimental Probabilities

Wins	Tries			
Tries				
Show decimal				

- How did your experimental data compare to your theoretical data?
 - What can you conclude between running the experiment 20, 40, and 60 times?
 - List the three games in terms of winning a particular game. Explain why you say so.
 - Draw a frequency distribution of your data (use data of 40 times).
 - Draw a histogram of your data (use data of 40 times).
- Discuss the terms:
 - Outcome,
 - Probability,
 - Theoretical probability,
 - Experimental probability,
 - Discuss the terms
 - Mutually Exclusive versus Independent Events
 - Qualities of a Good Estimat
 - What Is the Margin of Error?
 - Bootstrapping
 - Jackknifing
 - Bayesian Statistical Inference
 - Discuss the different Sample Size Determination techniques

Model Answer(s):

Answers come straight from the text. The assessor must judge by the wording the learner uses whether full understanding of the concepts has been achieved

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>