

**FURTHER EDUCATION AND TRAINING CERTIFICATE:
HAIRDRESSING:SAQA ID 65729 -LEVEL 4- 140
CREDITS**

**US ID:9015
LEARNER WORKBOOK
APPLY KNOWLEDGE OF STATISTICS AND
PROBABILITY TO CRITICALLY INTERROGATE AND
EFFECTIVELY COMMUNICATE FINDINGS ON LIFE
RELATED PROBLEMS**

Learner Information:

Details	Please Complete this Section
Name & Surname:	
Organisation:	K & R HAIR ARTISTRY INSTITUTE
Unit/Dept:	HAIRDRESSING
Facilitator Name:	TSM DEODUTT
Date Started:	
Date of Completion:	

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OVERVIEW

About the Learner Workbook	<p>This Learner Exercise Workbook has been designed and developed to evaluate learners' level of understanding of the APPLY KNOWLEDGE OF STATISTICS AND PROBABILITY TO CRITICALLY INTERROGATE AND EFFECTIVELY COMMUNICATE FINDINGS ON LIFE RELATED PROBLEMS.</p> <p>It forms part of a series of Learner Workbooks that have been developed for FURTHER EDUCATION AND TRAINING CERTIFICATE: HAIRDRESSING:SAQA ID 65729 -LEVEL 4- 140 CREDITS</p>		
Purpose	<p>The purpose of this Learner Exercise Workbook is to evaluate learners understanding on the specific outcomes and/or assessment criteria of the following SAQA Registered Unit Standards:</p>		
US No	US Title	Level	Credits
9015	Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems	4	6
Context	<p>This assessment represents the Formative Assessment component of the Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems for the FURTHER EDUCATION AND TRAINING CERTIFICATE: HAIRDRESSING:SAQA ID 65729 - LEVEL 4- 140 CREDITS and should be completed in the classroom/training room.</p>		
Resources	<p>The following are resources needed for this assessment:</p> <ol style="list-style-type: none"> 1. Learner Guide; and 2. Assessment Preparation. 		
Instructions to Facilitators	<p>Facilitators will be required to:</p> <ul style="list-style-type: none"> • Explain the completion of the workbook to each learner; and • Interview the learner on similar questions, should he/she not be able to write. 		

Instructions to Learners	<p>Learners will be required to:</p> <ul style="list-style-type: none"> • Complete the workbook as per the instructions; • Ensure that all questions are completed; • Ensure that the completion of the workbook is their own work; • Ensure that all annexure are attached to the workbook and clearly referred to;
Assessment Time	Learners are required to complete this assessment within the allocated time frame of.... hours.
Total Mark	This formative assessment carries a total mark of _ points . In order to meet the pass mark, learners are required to achieve a minimum of 80% of the total marks.
Equipment	<p>Learners are required to have the following equipment in order to complete this workbook:</p> <ul style="list-style-type: none"> • Pen and Pencil; • Ruler; and • Exam Pad – for additional paper.

GENERAL INFORMATION

LEARNER DETAILS		
Learner Full Names		
Learner ID No.:		
Organisation:	K & R HAIR ARTISTRY INSTITUTE	
Unit/Dept:	HAIRDRESSING	
Contact Details:	Telephone /Cell Numbers:	Email Address:
WORKSHOP DETAILS		
Workshop Venue:		
Facilitator Name:	TSM DEODUTT	
Date Started:		
Date Completed:		

ASSESSMENT PREPARATION CHECKLIST

DESCRIPTION	YES	NO	COMMENTS/CONTINGENCY
This assessment is a formative assessment and it is based on the outlined unit standard/s for the Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems module.			
Your assessment evidence for Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems module needs to be submitted on..... (day) of.....(month).....(year) at the following address/place.....			
You will be assessed based on the outlined Unit Standards. The assessment activities are linked to specific outcomes/assessment criteria of the outlined Unit Standards.			
To determine your competence level, the following are the methods to be used for this assessment: 1. 2.			
To be declared competent on Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems module (formative assessment), you should have obtained at least 80% of the total mark of this assessment.			
You will be provided with detailed feedback on your performance of this assessment as follows: 1. Written Feedback 2. Verbal Feedback			

Should you be declared “not yet competent” on this assessment, you will be entitled for re-assessment opportunity/ies.			
You will be required to re-submit evidence (only for areas) you were declared not yet competent. A date for re-submission will be agreed with the assessor.			
You will be entitled to lodge an appeal should you not be satisfied with the assessment decision of your assessment.			
You will be required to provide the assessor feedback on assessment procedure – this is to assist in improving the assessment practices.			
Your results of assessment and portfolio of evidence information will not be provided to any person without your written consent.			

Learner's Declaration

I.....herewith declare that I am ready for the assessment, that we have reviewed the assessment preparation and plan, I understand the assessment process and I am happy that the assessment will be conducted in a fair manner.

Learner Signature:	Date:	Facilitator Signature:	Date:

Learning Unit

1

Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems

UNIT STANDARD NUMBER	:	9015
LEVEL ON THE NQF	:	4
CREDITS	:	6
FIELD	:	Physical, Mathematical, Computer and Life Sciences
SUB FIELD	:	Mathematical Sciences

PURPOSE:

This Unit Standard is designed to provide credits towards the mathematical literacy requirement of the NQF at Level 4. The essential purposes of the mathematical literacy requirement are that, as the learner progresses with confidence through the levels, the learner will grow in:

- A confident, insightful use of mathematics in the management of the needs of everyday living to become a self-managing person
- An understanding of mathematical applications that provides insight into the learner's present and future occupational experiences and so develop into a contributing worker
- The ability to voice a critical sensitivity to the role of mathematics in a democratic society and so become a participating citizen.

People credited with this unit standard are able to:

- Critique and use techniques for collecting, organising and representing data.
- Use theoretical and experimental probability to develop models, make predictions and study problems.
- Critically interrogate and use probability and statistical models in problem solving and decision making in real-world situations.

LEARNING ASSUMED TO BE IN PLACE:

The credit value is based on the assumption that people starting to learn towards this unit standard are competent in Mathematical Literacy and Communications at NQF level 3.



Activities

Complete the following questions as per instructions provided

1.1 Identify 3 situations or issues in your workplace that can be dealt with through statistical methods and in each case say what type of routine statistics you would gather:

Situation/issue	Type of Statistics

1.2 Explain how **forecasting** plays a role in your business unit and organisation:

2. Read the following article written by the statistician-general of SA, and then answer the questions that follow:

Civil judgments for debt down 15.8% in first quarter

June 23, 2005

By Palilehohla

Not all data released by Statistics SA make the headlines. However, some of the less prominent statistical releases contain important insights, which shed light on **trends** and developments in society as a whole and the economy in particular.

For example, each month Stats SA releases data on civil cases for debt. This **survey**, which covers a **sample** of magistrates' offices, collects information regarding civil cases recorded, civil summonses issued and civil judgments recorded.

It provides information on the extent of unpaid debt in South Africa, which is used by the private and public sectors as an indicator of economic performance.

Each month the survey covers the number of civil cases recorded; the number of civil summonses issued for debt; the number of civil judgments recorded for debt; and the value of civil judgments recorded for debt.

The most recent data released in this **series** reports on three periods: the month of March 2005; change over the period March 2004 to March 2005; and change between the first quarter of 2004 compared with the first quarter of 2005.

In most areas monitored there was a decrease in the **indicators** of debt. The total number of civil summonses issued for debt in the first quarter of 2005 decreased by 16.4 percent compared with the first quarter of 2004.

The big contributors to this decrease were summonses issued in respect of money lent (down 6 percentage points), promissory notes (down 2.3 percentage points), "other" services (down 2.3 percentage points), goods sold on open account (down 1.7 percentage points) "other" debts (down 1.7 percentage points) and rent (down 1.4 percentage points).

Following this pattern, the total number of civil judgments recorded for debt for the first quarter of 2005 decreased by 15.8 percent compared with the first quarter of 2004.

The contributors to this decrease were civil judgments in respect of money lent (down

5.1 percentage points), promissory notes (down 2.4 percentage points), rent (down 2.2 percentage points), and "other" debts (down 1.8 percentage points).

The total value of civil judgments recorded for debt for the first quarter of 2005 decreased by 5.3 percent compared with the first quarter of 2004.

The major contributors to this decrease were civil judgments recorded in respect of promissory notes (down 4.1 percentage points) and "other" debts (down 2 percentage points).

However, this decrease was slightly counteracted by an increase in civil judgments recorded in respect of professional services (1 percentage point).

Turning to the month of March this year, 65 406 civil judgments for debt amounting to R521 million were recorded.

The largest contributors to this amount were civil judgments relating to money lent (R155.3 million, or 29.8 percent), "other" debts (R135 million, or 25.9 percent) and promissory notes (R77.4 million, or 14.9 percent). During this month, 108 302 new civil summonses for debt were issued.

Comparative data released as at March 2005 show a decline in the number of civil summonses issued for debt between March 2001 and March 2005. Peaking in December 2002 at over 159 000, the March 2005 figure has fallen to just over 108 000.

The number of civil judgments recorded for debt reached a high of approximately 105 000 in mid-2003, falling to approximately 65 400 in March 2005.

Today **Stats SA** releases the latest data on civil cases for debt, which will reflect the position as at April 2005. Although a lesser-known indicator of trends in the economy, this monthly release provides important insights into economic performance.

Pali Lehohla is the statistician-general and head of Statistics SA. For more information on Stats SA and its outputs, including the latest statistics of civil cases for debt, visit www.statssa.gov.za, or contact user services on (012) 310-8600

2.1 Explain what is meant by a **“trend”** (paragraph 1):

2.2 What “trend” has been identified by Stats SA according to this article?

2.3 Explain what is meant by a **“series”** (paragraph 5). Refer specifically to the series mentioned in the article:

2.4 List the **indicators of debt** mentioned in the article:

2.5 Explain the difference between a **census** and a **sample**:

2.6 You want to undertake a statistical study of **absenteeism** in your company. Would you take a census or a sample? Give reasons for your answer.

2.7 In order to collect a representative sample from your **team/ business unit**, how many members would you have to survey? Explain how you arrived at that figure.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

2.8 In order to collect a representative sample from your **company**, how many employees would you have to survey? Explain how you arrived at that figure.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

3.1 Group work (30 minutes):

Choose a topic that relates to your class, e.g. you want to determine the number of people who are in favour of abortion among the class members, or the number of happily married learners, or the education level of the learners in the class, in fact, any topic of your choice. Draw up a questionnaire using the **dichotomous key** (about five sets of questions), do a quick survey and present your findings to the class:

Topic:

Questionnaire:

Question	Yes/no	Go to/ completed
1. A. B.		
2. A. B.		
3. A. B.		
4. A.		

B.		
5. A. B.		

3.2 Group work (20 minutes):

Draw up a **10-point checklist** that will help you determine if a questionnaire meets the criteria as set out in your Learner Guide:

3.3 Likert scale

A survey attempted to evaluate student interest about a range of classroom topics. Students were asked to rank their interest in various potential topics according to this scale:

- 10 if they felt a topic was very interesting
- 6 if they felt a topic was above average interest
- 4 if they felt a topic was below average interest
- 1 if they felt a topic was not worth studying in class

Please note that only four responses were permitted: 10, 6, 4, and 1. Is this an acceptable survey design? Explain your answer:

4. When interviewing your team for the purposes of a survey, do you think that there could possibly be **bias** from either your side or their side? Discuss possible reasons for the bias, based on the information in the Learner Guide. Add any other causes of bias that you may be aware of.

5.1 Here are the test scores of a class of learners:

100, 100, 99, 98, 92, 91, 91, 90, 88, 87, 87, 85, 85, 85, 80, 79, 76, 72, 67, 66, 45

- a) What is the **average score (mean)** of the class for this test?
- b) Is the sequence written in **ascending or descending** order?
- c) Determine the **median** score
- d) James obtained a mark of 90 and Petrus obtained a mark of 79 for the test. How would you describe their results in relation to the mean?
- e) In order to get a better idea of how a given data point relates to other data, it is important to get an idea of how spread out the data are. One way of doing this is by using the **range**. The range is the distance between the highest and lowest data points in a set. What is the 'range' of the scores for this test?

a)
b)
c)

d)

e)

5.2 Group work (15 minutes): Find out how old each learner in the class is

5.2.1 Planning phase:

- First decide on the quickest and most effective way to obtain the required information
- How can you ensure that the information is accurate and representative?

5.2.2 Obtain and sort data: Calculate the **average age (mean)** of the learners in this class.

5.2.3 Calculate the **median** of the ages of all the learners. Show the sequence in **ascending order**:

5.2.4 **Analyse data:**What conclusions can you reach based on the data?

5.2.5 **Reflect on the process you followed to obtain the information:**

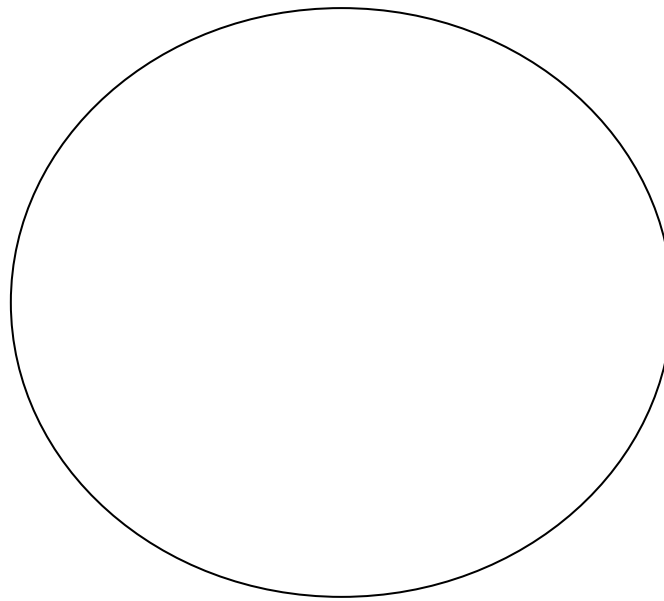
- Was it effective?
- Were respondents cooperative?
- What would you do differently next time?

6.1 Draw a reasonably accurate **pie chart** by hand based on the following data:

- **Absenteeism due to transport problems** 108°
- **Absenteeism due to illness** 162°
- **Absenteeism due to training** 45°
- **Absenteeism due to family commitments** 45°

Give your chart a title that accurately reflects the kind of data represented;

Title: _____



Legend: _____

6.2 Give an example of the **type of data in the workplace** that you would represent with a) a bar chart, b) a line chart and c) a scatter diagram:

a)
b)
c)

7. Read the following article written by the statistician-general of SA, paying particular attention to his explanation of the **limitations of statistical information**, and then answer the questions that follow:

New employment survey makes three improvements

By Palilehohla

This article was originally published in the Business Report on 07 July 2005

Statistics SA continues to improve the quality of its statistics. The quarterly employment statistics (QES) survey was published for the first time on June 28. This survey replaces the quarterly survey of employment and earnings (SEE) which in turn replaced the survey of total employment and earnings (STEE).

There are important differences between these surveys, all aimed at improving the **quality of the information**. First, the STEE was drawn from the initial business address register, which was not based on the comprehensive taxation database that the current surveys are based on. It reported formal employment in the non-agricultural sector of 4.7 million people.

Second, the recently introduced QES covers all employing enterprises in the formal non-agricultural business sector registered for income tax, whereas the SEE was restricted to enterprises registered for VAT, with an annual turnover of R300 000 or more.

The increase in the coverage of businesses in the QES results in **extensive coverage of the formal labour market, as most small businesses are now included in the estimates as well**.

For the quarter to December 2004, the **SEE reported employment of 6.559 million people, compared with the estimate of 7.075 million in the QES**.

Third, the **definition of employees** has been brought in line with International Labour Organisation (ILO) definitions and concepts. Previously, the SEE included working proprietors and own account workers in the estimates of employment, in addition to the

employees of an enterprise. This did not allow for the meaningful calculation of estimates for average monthly earnings of employees.

However, the QES restricts the coverage to employing businesses only, therefore excluding working proprietors in the estimates. It is therefore now possible to provide estimates for employment and earnings as well, as the survey is in accordance with ILO definitions and recommendations.

The SEE and the QES are not comparable because of these improvements. The estimates for employment for the quarter to December, published on June 28 in the QES, show a difference of about 500 000 employees. This was largely due to the extended coverage of the QES survey, made possible by improvements to the business frame that I reported on in earlier articles.

The drop in employment in the first quarter was largely caused by **seasonal factors**, with many people being employed for the December period only. **The published results do not take this seasonality into account as it is not possible to develop seasonally adjusted estimates for a series that has only been published for two periods.**

As the series progresses and more results become available, it will become possible to get a clear insight into the labour market by using the QES survey estimates.

Furthermore, **the major contributors to differences in employment levels between the QES for December and the SEE for December are the financial intermediation, insurance, real estate and business services industry, up about 40 percent; the construction industry, up about 30 percent; and the transport, communication and storage industry, up about 50 percent. These increases are mainly due to the QES survey's coverage of small businesses in these industries. The SEE did not cover many of these small businesses.**

Information regarding employers, employees and the self-employed can be obtained

from the **six-monthly labour force survey, conducted among 30 000 households countrywide**. The results of this survey should be read in conjunction with those of the QES, as they all inform on the dynamics in the labour market.

Over time, by using register-based frames, Stats SA has continued to provide a more **representative** picture of the economic and the population dynamics of the country.

The underlying purpose of statistics is to inform users and policy, and statistics should not be misconstrued to suit specific situations. Extreme caution should be exercised when commenting on a **time series that has only two data points** and the differences between relevant series should be kept in mind at all times.

PaliLehohla is the statistician-general and head of Statistics SA. For more information on Stats SA and its outputs visit www.statssa.gov.za, or contact user services on (012) 310-8600

7.1 Explain how the representative sample has grown from 4.7 million (STEE findings) to 6.559 (SEE) to the current 7.075 million (QES findings):

7.2 What categories of workers have been excluded from QES and why?

7.3 Information regarding employers, employees and the self-employed is obtained by conducting surveys:

- a) What is the frequency of these surveys?
- b) Why should they be conducted frequently?
- c) What is the size of the sample?
- d) Do you think that it is a representative sample? Give a reason for your answer.
- e) What are some of the problems regarding choosing a sample of this nature?

a)
b)
c)
d)
e)

7.3 What are the limitations of a time series that has only two data points?
(par.14)?

On a lighter note:

"If a statistician had her hair on fire and her feet in a block of ice, she would say that 'on average' she felt good."

SELF-ASSESSMENT

The learner must make use of the following self-evaluation checklist to rate himself against the learning outcomes of this particular training module in establishing the level of mastery of the information.

1. Not able to comply
2. Reasonable compliance (Not acceptable for final evaluation)
3. Able to comply fully

LEARNING OUTCOMES		1	2	3
1				
2				
3				
4				

Learner Signature

Date

Facilitators' Signature

Date

ASSESSMENT FEEDBACK REPORT

FACILITATOR FEEDBACK & REMARKS

ASSESSMENT JUDGEMENT

Learner's Total Mark: Requirements met ☐ Requirements not met ☐

Action/s required:

By when:

LEARNER FEEDBACK & COMMENTS

DECLARATION BY THE FACILITATOR

I (Facilitator) hereby certify that I have examined the learner workbook and I am satisfied with the evidence provided by the learner.

DECLARATION BY LEARNER

I,declare that I am satisfied that the feedback given to me by the Facilitator was relevant, sufficient and done in a constructive manner. I accept the assessment judgment and have no further questions relating to this particular assessment event.

Learner	Date	Facilitator	Date

DECLARATION BY THE ASSESSOR

I (Assessor) hereby certify that I have examined the learner workbook and I am satisfied with the Facilitator Judgment of this assessment.

Assessor	Date	Moderator	Date