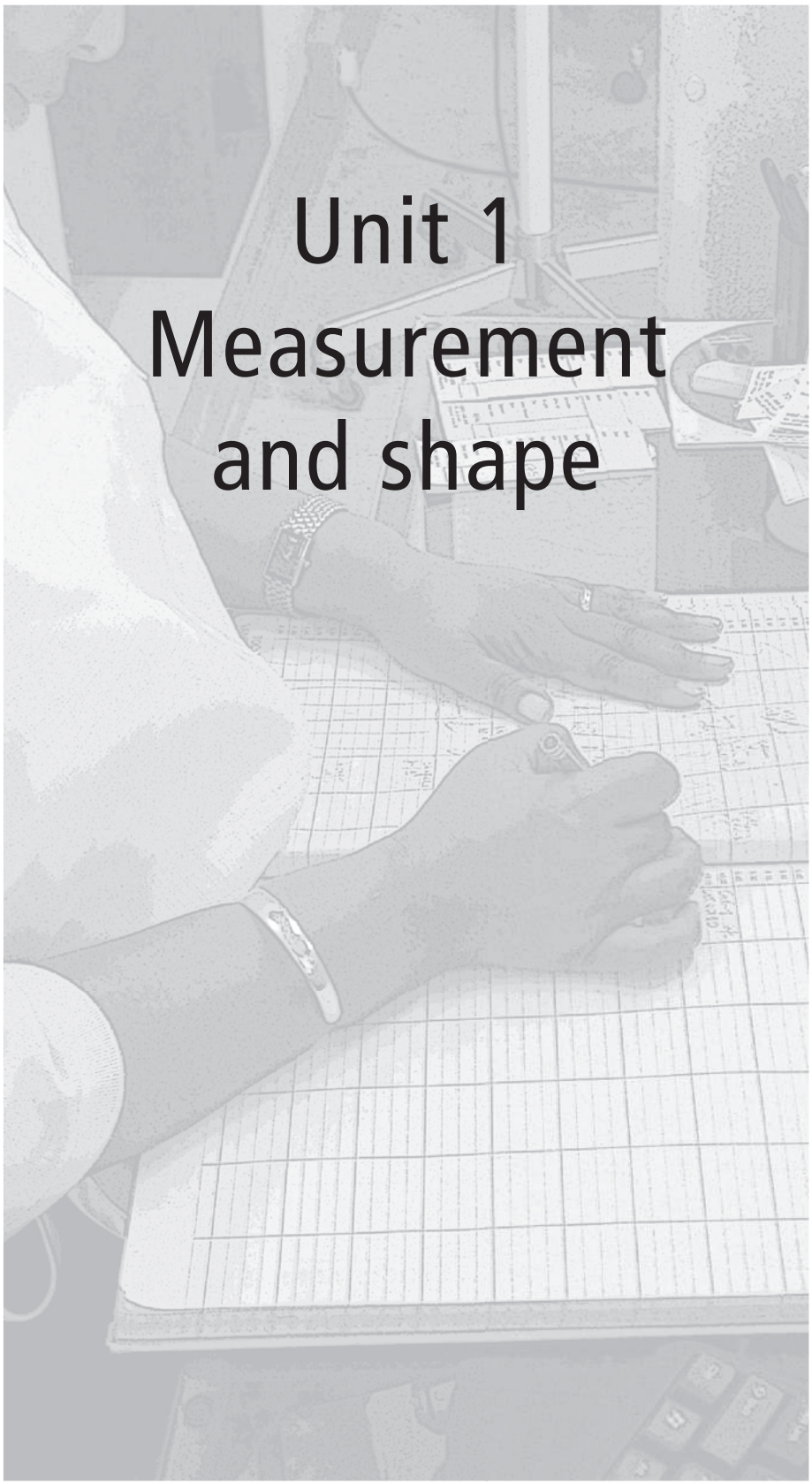
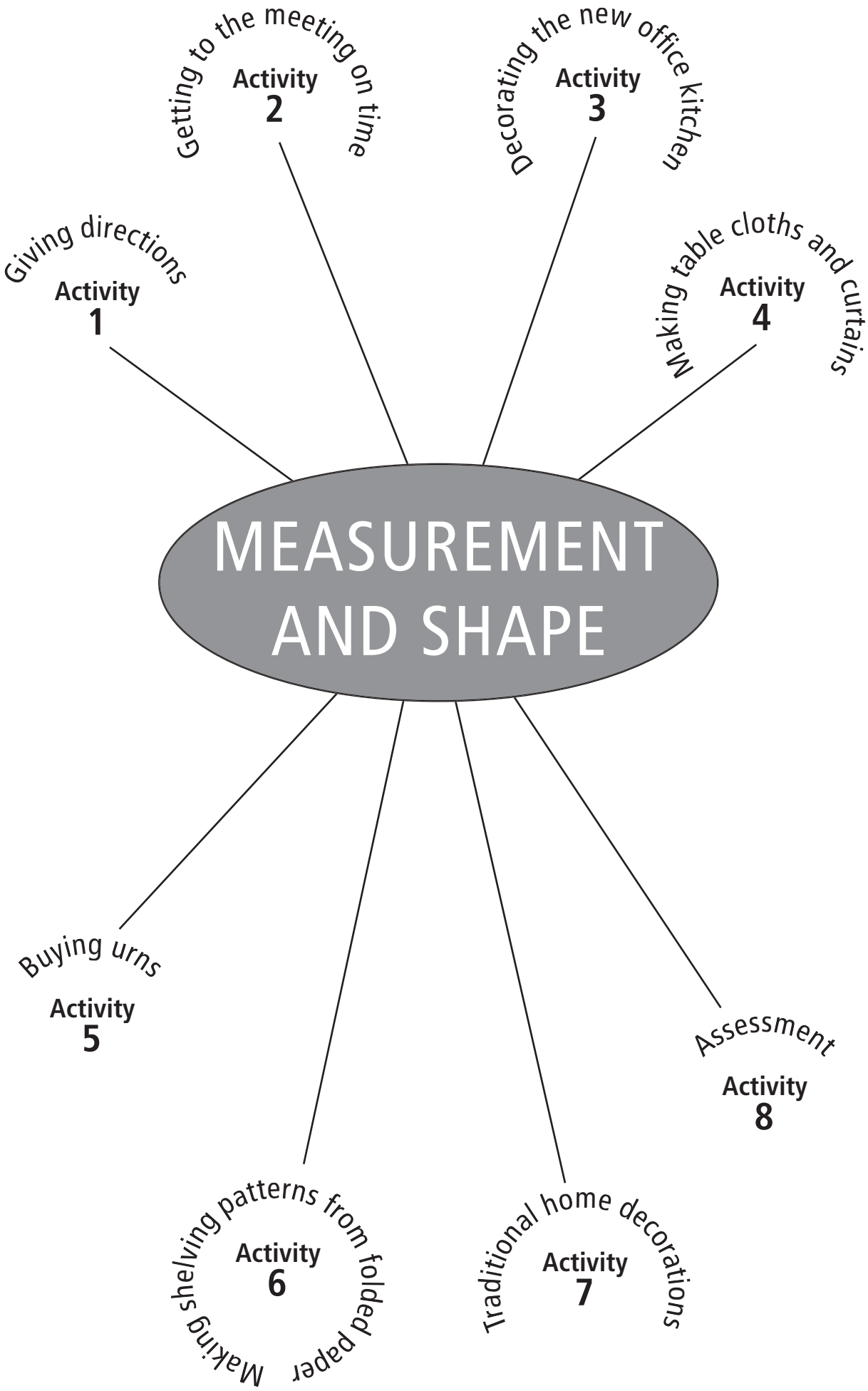
Mathematical Literacy

NQF LEVEL 3



Unit 1 Measurement and shape

Generic Business Administration


MEASUREMENT AND SHAPE
Giving directions
Activity 1
Getting to the meeting on time
Activity 2
Decorating the new office kitchen
Activity 3
Making table cloths and curtains
Activity 4
Buying urns
Activity 5
Making shelving patterns from folded paper
Activity 6
Traditional home decorations
Activity 7
Assessment
Activity 8

Overview

Unit Standard 14108 has two Specific Outcomes:
- o SO 1 focuses on measurement.
- o SO 2 focuses on shape.

This unit uses a number of different contexts to develop learners understanding of measurement and shape including:
- Reading information from tables
- Knowing what is the appropriate unit of measurement within a particular context
- Choosing the appropriate measuring instrument for a particular problem
- Thinking about the most appropriate way of measuring
- Thinking about how the context impacts upon the reasonableness of the measurement reading, calculation or solution.
- Converting between units of measurement
- Using estimation techniques appropriate to the context
- Calculating areas, perimeters and volumes and how contexts impact on one's approach
- Developing models to describe situations, to analyse them and to make predictions about them
- How context can impact upon decisions about what algorithms to use in calculations
- Using the available technology to solve problems in particular electronic calculators
- Explaining the choice of algorithm and the procedures used
- Calculating effectively, efficiently and correctly
- Reading road maps
- Understanding scale in sketches and maps
- Using scale bars and ratio to calculate the actual size and distances.
- Symmetry and transformation of shapes

In addition to developing the mathematical skills of learners, this unit is also intended to give learners an opportunity to develop an understanding of:
- Road maps – how to read and interpret them and use them to calculate distances
- Giving directions including the drawing of simple maps
- Planning travel and meeting arrangements
- Calculating the requirements and costs of fitting a new office kitchen.

The unit consists of eight activities of which one is an Assessment Activity.

Mathematical literacy involves using ones knowledge of shape, space, measurement, numbers and data to make sense of the world. It also involves using one's knowledge of particular contexts to make sense of and increase one's knowledge of shape, space, measurement, numbers and data. There are several key issues in measurement and shape, and the activities in this unit attempt to address them in ways that are relevant to business administrators.

Unit outcomes

The following Unit Standards, Specific Outcomes and Assessment Criteria are addressed by this unit:

Measure, estimate and calculate physical quantities and explore, describe, represent, interpret and justify geometrical relationships in 2 & 3 dimensional space relevant to life or workplace contexts (US 14108).
- Estimate, measure and calculate physical quantities to solve problems in practical situations (SO1).
  - o Scales on measuring instruments are read correctly (AC1).
  - o Quantities are estimated to a tolerance acceptable justified in the context of the need (AC2).
  - o The appropriate instrument is chosen to measure a particular quantity (AC3).
  - o Quantities are measured to within the last step of the instrument. (AC4).
  - o Calculations are carried out correctly (AC5).
  - o Symbols and units are used in accordance with SI conventions and as appropriate to the given / specified situation (AC6).
- Explore, analyse and critique, describe and represent, interpret and justify geometrical relationships and conjectures to solve problems in two and three dimensional geometric situations (SO2).
  - o Descriptions are based on a systematic analysis of the shapes and reflect the properties of the shapes (AC1).
  - o Descriptions include quantitative information appropriate to the situation and need (AC2).
  - o Conjectures, as appropriate to the situation, are based on well-planned investigations of geometrical properties (AC3).
  - o Representations of the problems are consistent with and appropriate to the problem context. The problems are represented comprehensively and in mathematical terms (AC4).
  - o Results are achieved through efficient and correct analysis and the manipulation of representations (AC5).
  - o Problem solving methods are presented clearly, logically and in mathematical terms (AC6).
  - o Solutions are correct and are interpreted and validated in terms of the context of the problem (AC7).

Business Administration is a qualification that needs to help learners develop a set of general skills as well as the flexibility to apply these in a range of contexts. In this unit we provide learners with different contexts modeled on real workplace contexts. We help learners to understand and think there way into each of the contexts before starting the activities.

This unit develops the skills required to achieve the Assessment Criteria of Unit Standard 14108.

Activity 1 – Giving directions
In this activity students read road maps of a city and use the key to calculate distances. They draw up a set of directions which includes a simple map, they then think in general about what they need to include when they give people directions to get to a venue.

Reading maps includes the skill of looking up a road name in an alphabetical index, finding the correct block (cell) in the rows and columns and understanding that a map is a styalised view from above.

Activity 2 – Getting to the meeting on time
This activity extends students map reading skills. Students are again asked to think about directions and scale but now also distance, speed, time. They are asked to think about how the time of day affects traffic flow and traveling time.

They are asked to read aeroplane timetables and to book a flight. They are asked to schedule a meeting that best suit a person who has to fly in from another city and leave on the same day. Usually business administrators will get someone else to find the most convenient flight to book, but it is useful for them to have an understanding of what things limit the possible suitable flights.

Activity 3 – Decorating the new office kitchen
In this activity we use the context of a new office kitchen to ask students to think about calculating areas and perimeters of rectangular shapes. Learners are asked to work out how many wall and floor tiles of different sizes they will need to tile specific areas. They are also asked to calculate the costs of the different tiles.

Activity 4 – Making table cloths and curtains for the new kitchen
This activity uses extend both the context of decorating a new office kitchen and the concepts of area and perimeter. In this activity learners are asked to calculate how much material and fringing they would need to make circular table cloths and curtains for a new office kitchen. They are asked to think about how the context impacts upon how accurate their answers need to be and also how they apply the concepts of area and circumference.

Activity 5 – Buying urns
In this activity learners work with capacity and volumes of cylindrical shapes. They use what they know about the area of a circle and see how this relates to the volume of cylinders.

They also draw urns from different views and use this to find out information about what it is the limits the least amount of water that an urn can hold.
They are asked to convert between different metric units of volume and capacity.

Activity 6 – Making shelving patterns from folded paper
One of the range statements in this unit standards states that learners should investigate symmetry and tessellations in the context of artifacts and architecture. In this activity and the next activity we the context planning for housing conference. Students examine the patterns in traditional paper shelving.

Learners make their own patterns by folding and cutting paper. They find out more about reflected patterns. They then use what they know to make paper chains and cards for an office party.

Activity 7 – Traditional home decorations
In this activity the context of the housing conference is extended. Students examine different kinds of traditional external decorations on homes. In this activity they focus on how patterns are made by placing a key element of the pattern in a variety of positions. Learners explore the following ways of changing the position of a shape: turning the shape (rotation), flipping the shape (reflection), sliding the shape (translation). Learners analyse patterns using this language. They also make their own patterns by making these movements with shapes.

Activity 8 – Assessment
The assessment focuses on students knowledge and skills around pattern and design. In particular is assesses their ability to see the basic element in a design and how this element has been moved (rotated, reflected or translated) to make up the pattern. It also assesses students ability to recognise symmetry.

14108	Measure, estimate, calculate physical quantities, explore, describe and represent, interpret, justify geometrical relationships in 2 & 3-dimensional space relevant to the life or workplace of the comm									
		ACTIVITY	1	2	3	4	5	6	7	8
SO1	Measure, estimate, and calculate physical quantities in practical situations.									
	AC1	Scales on the measuring instruments are read correctly.	✓			✓			✓	
	AC2	Quantities are estimated to a tolerance justified in the context of the need.	✓	✓	✓	✓	✓			
	AC3	The appropriate instrument is chosen to measure a particular quantity.	✓			✓			✓	
	AC4	Quantities are measured correctly to within the least step of the instrument.				✓			✓	
	AC5	Calculations are carried out correctly.	✓	✓	✓	✓	✓		✓	
	AC6	Symbols and units are used in accordance with SI conventions and as appropriate to the situation.	✓	✓	✓	✓				
SO2	Give opinions on the implications of the modelled data for the required purpose.									
	AC1	Descriptions are based on a systematic analysis of the shapes and reflect the properties of the shapes accurately, clearly and completely.			✓	✓	✓	✓		
	AC2	Descriptions include quantitative information appropriate to the situation and need.	✓	✓	✓	✓	✓			
	AC3	Conjectures as appropriate to the situation, are based on well-planned investigations of geometrical properties.	✓	✓	✓	✓	✓			
	AC4	Representations of the problems are consistent with and appropriate to the problem context. The problems are represented comprehensively and in mathematical terms.	✓	✓	✓	✓	✓	✓		
	AC5	Results are achieved through efficient and correct analysis and manipulation of representations.	✓	✓	✓	✓	✓	✓		
	AC6	Problem-solving methods are presented clearly, logically and in mathematical terms.	✓	✓	✓	✓	✓			
	AC7	Solutions are correct and are interpreted and validated in terms of the context of the problem.		✓	✓	✓	✓			

Activity 1 — Giving directions

Assisting with travel arrangements is often an important part of business administrators' work. In this activity we ask learners to construct directions from the airport. Giving directions always seems like an easy task, but following directions is often difficult. In this activity we hope to give learners practice in writing out directions and thinking about how to give good written directions.

ABOUT THIS ACTIVITY

Learners are asked to read road maps. This includes finding streets in the index (which gives practice in negotiating one's way around an alphabetical listing), and understanding how the index states on what page and in which cell to find the street. Then learners need to find the correct cell on the correct page. Working with road maps gives learners practice in using a grid and the associated language. Learners are then asked several questions about the maps before being asked to draw a simple map and provide directions. Reading maps entails interpreting a view from above with particular stylised conventions.

This activity prepares learners to meet the following outcomes of Unit Standard 14108:
SO 1: Measure, estimate and calculate physical quantities in practical situations:
o AC 1, 2, 3, 5, 6
SO 2: Explore, describe and represent, interpret and justify geometrical relationships:
o AC 2, 3, 4, 5, 6

MANAGING THIS ACTIVITY

The maps and information that learners need are provided on the handout. However, it would be better for them to look up the information in a map book as this entails finding the pages in the index and moving from one page to another.

In the appropriate answers we provide further guidance about what the key learning issues are and how to assist learners with these.

1.1 The keyplan is on page 1 of the handout, page ii of the map book.

(a) The airport is on page 19 of the map book. Learners can find this on the keyplan.

(b) Mowbray is on pages 15 and 16 of the map book. Learners can find this on the keyplan.

1.2 It is usually easier to look up the road in the index at the back of the book. The index tells you in what cell you will find the road for which you are looking.

Check that learners know how to use an alphabetical listing. Some learners may know to look up something by its first letter but not considering finding their way around the listing by looking at the second and third letters of the word. In this example the R's appear on pages 80 to 82. It is quicker to scan the list for Ro than to start reading from the beginning of the list on page 80.

(a) The index tells you to find Roseberry Road on page 16 and in cell number CD 31 of the grid.

This is in the top left hand corner of the grid on page 31.

Check that learners know the language of grids and understand what cells, rows and columns mean in the context of a grid. Like many words they have different meanings in other contexts. Learners may think about the non-mathematical meanings when they hear the words.

Check also that learners understand the convention of road map books which give the page number in bold followed by the cell number.

You may want to ask learners to check whether this is the same or different in other roadmap books and to find the place where the convention is explained in a particular map book.

1.3 In this question we ask learners to focus on describing the part of the route on the freeway, which includes thinking about the distances before reaching key landmarks, and important road signs and road names.

(a) You turn onto the N2.

(b) The legend is on the top left hand corner of page 11 in the map book and page 1 of the handout.

(c) 1 cm is 2 kilometres.

Many learners may find it easier to measure 1 cm on the scale bar and to see that this shows 2 km than to work with the ratio written in figures.

(d) It is useful to be able to tell people how far they should expect to travel before looking out for a key landmark.

An example of this is given in question 1.3.5 below.

(e) They can travel about roughly 10 km to 12 km on the N2 before turning off. If they had local knowledge of Cape Town they would be looking for the Raapenberg Road / Mowbray / Pinelands off ramp.

1.4 You may want to talk with learners about checking that when they give directions they are certain that the signboard explains a road or off-ramp in the way in which they think it does. This is particularly important when giving directions to people who do not know the area and are not able to translate between what the signboard says and what the directions may state e.g. Wynberg off ramp from M3 is marked as Travato Link. This may make some sense to some people from Cape Town but not necessarily to someone from Phalaborwa.

(a) Sometimes road signs will use one name and sometimes they will use another. Travellers need to be reassured that they are on the correct road. For example, if they think they turned onto the N2 but a signboard suddenly appears that mentions Settlers Way, are they still on the correct road?

(b) The N2 in this particular section is also called Settlers Way.

(c) The M52 is known as Raapenberg Road in that section.

(d) You turn left into Klipfontein Road. If you turn right the road is called Durban Road.

(e) You can find out that this road is called Durban Road on page 15 of the map book. This is shown on the left hand side border of page 16.

1.5 It will be easier for learners to describe the route verbally than to write it down. Describing it to a friend helps to clarify one's thoughts. The pairs should assist each other to improve their directions.

1.6 Here is one potential route description:
Look for the N2 to Cape Town road signs and off-ramp on the Airport Approach Road. This section of the N2 is called Settlers Way. You will drive along the N2 for about 10 km – 12 km. During this time you will pass (amongst other things):

- informal settlements,
- the Heideveld, Modderdam Road (M10) off-ramp,
- the Vanguard Drive off-ramp (M7)
- the Jan Smuts (M17) and Bunga Avenue off-ramps as well as a sewerage plant on the left and cooling towers on the right.

After about 10 km look for the Raapenberg Road / Mowbray off-ramp to the left. Turn left into Raapenburg Road at the robots. Continue along Raapenberg Road until you get to the next set of traffic lights. Turn right into Klipfontein Road (it could still be called Durban Road at this point). Turn left into the second road you come to and continue for 2 blocks. You will find No.13, Mountain View Bed and Breakfast on your right hand side.

Ask learners to read their directions to each other. The class should choose the clearest and simplest directions. Discuss the principle of more is less – in this sort of situation it is often easier to follow simple directions than directions that give too much detail.

Learners' maps should indicate whether they are drawn to scale or not.

1.7 It is useful to have the telephone number of the place of accommodation in case they get lost. Then they can phone and ask for further directions. They may also be delayed and need to tell people when to expect them. This question is only included as a practical task – learners will need to be given a fax number to use.

1.8 Learners may be able to give good directions but find it hard to generalize about what the key features of good directions/ maps are. Often it is more difficult for learners to work from the general to the specific than it is for them to work from the specific to the general. You may like to start by asking learners to give directions to somewhere nearby e.g. the closest station. After listening to several examples ask learners what the key features of good directions are: they should talk about landmarks and ways of estimating distances, for example a certain number of blocks (if walking), side streets or buildings or how far in kilometres or approximately how long it will take to get there. Signboards are excellent landmarks.

Some important features of good directions are:

- To mention important landmarks (clearly marked buildings or institutions whose structure makes their function obvious, like mosques and churches and schools, as well as sign boards and turn offs) that the person will pass on the way, what places or features they can look out for before coming to an off-ramp, an upcoming street into which they must turn etc.
- Indicate how far they should continue on a particular road e.g. a certain number of kilometres, a particular amount of time, how many blocks or turn offs or side streets they will pass. This helps people following the directions to know that for a while they can relax and not be on the lookout for the next turning. It is important to let people know if this is approximate e.g. you will go past streets × and Y amongst other streets, you will travel for about N km, or whether the information is exact i.e. you will only cross over 3 streets, or the following 2 intersections, or it is exactly 9 km.
- Give them all the streets that they will need to turn into and whether they need to turn left or right.

Activity 1 — Giving directions

Ms Mdishane is coming for a job interview at your company. She is flying from Durban to Cape Town and will be staying at the Mountain View Bed and Breakfast. You have been asked to draw a map and send her written directions from the Cape Town International Airport to the place she will be staying. You need to use a road map to find the best route from the airport to the Mountain View Bed and Breakfast.

The handout provides sample pages from a Cape Town road map. However, it would be better if you could bring a real map book into class to look up the information.
The address for the Mountain View Bed and Breakfast is:

13 A Roseberry Road
Mowbray
Phone: 021 685 7135

1.1 Find the keyplan to the map pages on the handout.

1.1.1 On what page will you find the airport?

1.1.2 On what page will you find Mowbray?

1.2 Now that you know on what page Mowbray is, you need to find Roseberry Road on that page.

1.2.1 Use the index to the map book supplied to determine the page number and cell number in which Roseberry Road can be found.

1.3 Getting from the airport to Mowbray:

1.3.1 What is the first road you would turn into when you leave the Airport Approach Road?

1.3.2 Look back at the keyplan. Where on the page do you find the legend?

1.3.3 1 cm on the map corresponds to what distance in reality?

1.3.4 Why is it useful to be able to know distances when giving directions?

1.3.5 How far along the N2 do you need to travel before turning off it?

1.4 Landmarks are important in giving directions. Street names and road signs are a type of landmark that is very useful when giving directions. But there are also other important landmarks. Some of these are marked on road maps but others are not. It is also important to check what the road signs say as they sometimes explain things in unexpected ways.

1.4.1 Sometimes roads change names at some point. Why is it important to give people all the names of the road?

1.4.2 In the section of the N2 that you need to describe for this route, it is also known by another name. What is that name?

1.4.3 What is the road name for the M52 in the section of the map you will be describing?

1.4.4 What is the name of the road you turn into at the end of the M52? This road has one name if you turn left and another name if you turn right. Give both names.

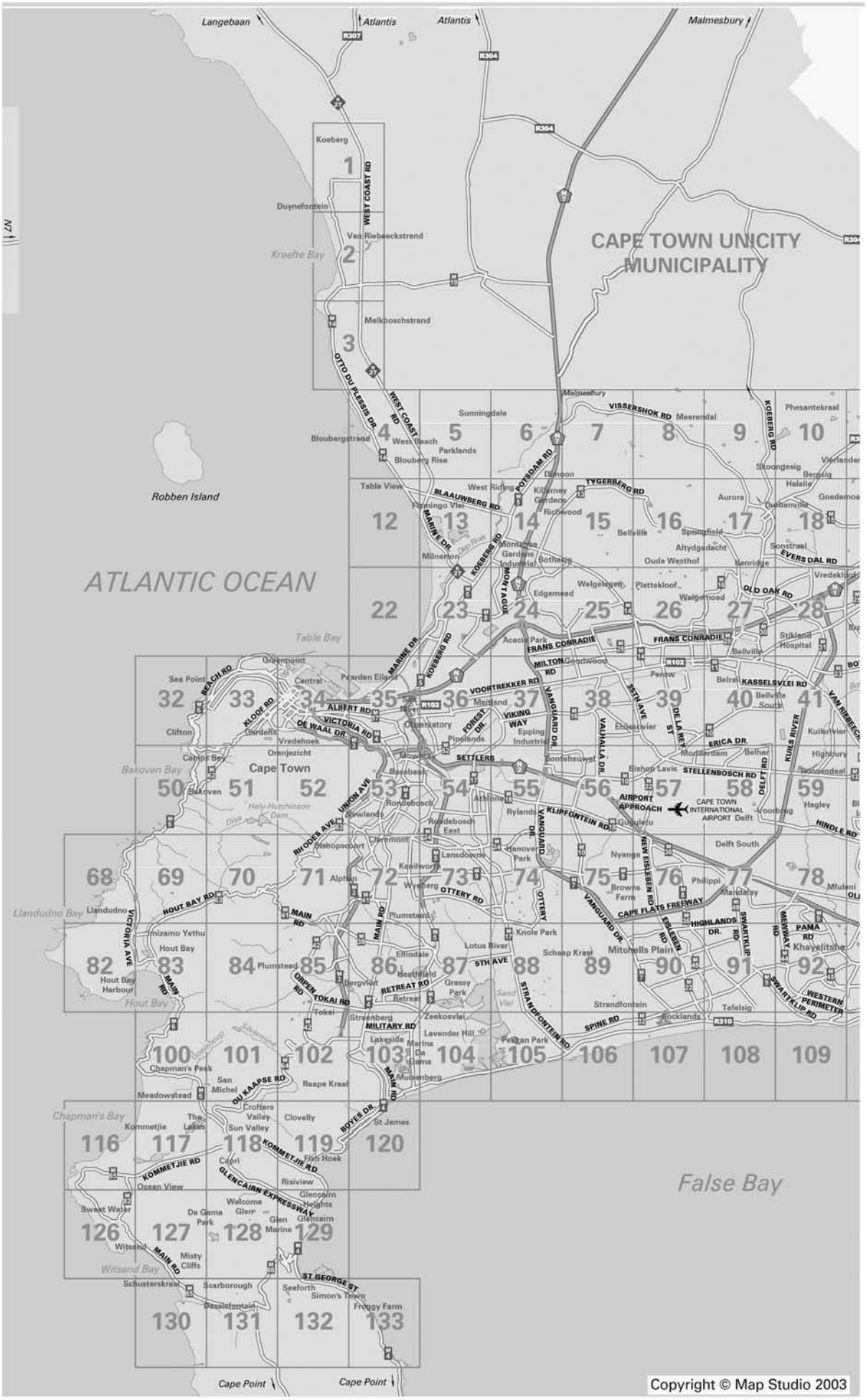
1.4.5 On what page in the map book will you find the second name of the road you mentioned above in question 1.4.4?

1.5 Tell a partner how you would get from the airport to Mountain View Lodge. Listen to his/her directions and use it to improve yours.

1.6 Now write down the directions and draw a map.

1.7 Why is it useful to put the telephone number of the Bed and Breakfast on the directions? Fax the map and directions to Ms Mdishane.

1.8 Write a list of the key points you need to keep in mind when you give someone directions.


CAPE TOWN UNICITY MUNICIPALITY
ATLANTIC OCEAN
False Bay
Robben Island
Langebaan
Atlantis
Malmesbury
Koeberg
Duynefontein
Van Riebeeckstrand
Kreefte Bay
Melkboschstrand
Bloubergstrand
Sunningdale
Table View
Milnerton
Table Bay
Cape Town
Bakoven Bay
Llandudno Bay
Hout Bay
Chapman's Bay
Witsand Bay
Cape Point
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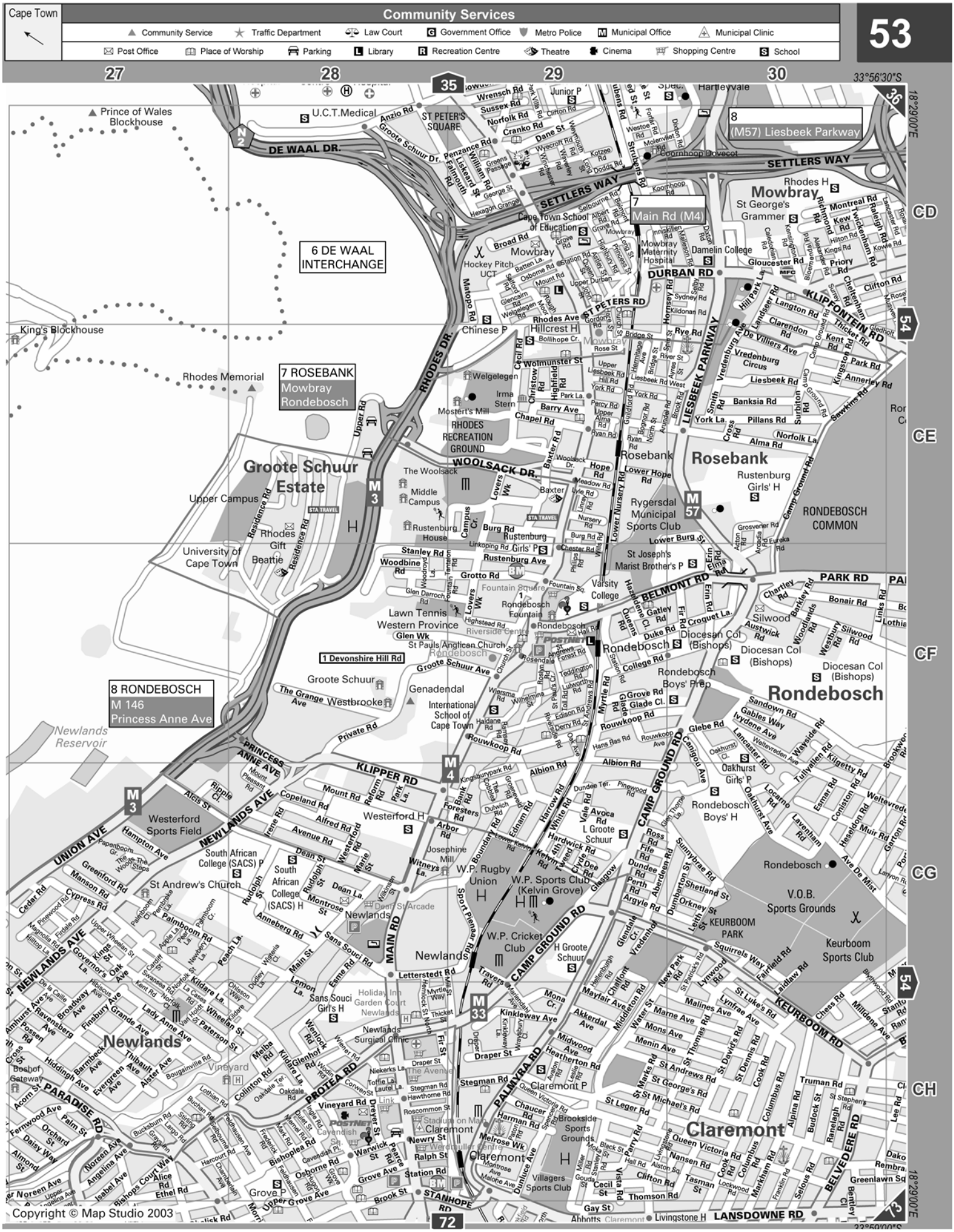
Cape Town
Community Services
Community Service
Traffic Department
Law Court
Government Office
Metro Police
Municipal Office
Municipal Clinic
Post Office
Place of Worship
Parking
Library
Recreation Centre
Theatre
Cinema
Shopping Centre
School
53
27
28
29
30
33°56'30"S
18°29'00"E
8
(M57) Liesbeek Parkway
7
Main Rd (M4)
6 DE WAAL INTERCHANGE
7 ROSEBANK
Mowbray
Rondebosch
8 RONDEBOSCH
M 146
Princess Anne Ave
1 Devonshire Hill Rd
DE WAAL DR.
SETTLERS WAY
RHODES DR.
DURBAN RD
ST PETERS RD
KLIPFONTEIN RD
LIESBEEK PARKWAY
WOOLSACK DR.
BELMONT RD
PARK RD
KLIPPER RD
CAMP GROUND RD
PRINCESS ANNE AVE
NEWLANDS AVE
UNION AVE
MAIN RD
PROTEA RD
PARADISE RD
PALMYRA RD
KEURBOOM RD
BELVEDERE RD
LANSDOWNE RD
STANHOPE RD
Prince of Wales Blockhouse
King's Blockhouse
Rhodes Memorial
Groote Schuur Estate
Upper Campus
University of Cape Town
Rhodes Gift
Beattie
Rhodes Recreation Ground
Rosebank
Rygersdal Municipal Sports Club
Rondebosch Common
Rondebosch
Rondebosch Boys' Prep
Rondebosch Boys' H
Oakhurst Girls' P
Diocesan Col (Bishops)
Westerford Sports Field
South African College (SACS) P
South African College (SACS) H
St Andrew's Church
Newlands
W.P. Rugby Union
W.P. Sports Club (Kelvin Grove)
W.P. Cricket Club
V.O.B. Sports Grounds
Keurboom Sports Club
Claremont
Brookside Sports Grounds
Villagers Sports Club
Newlands Reservoir
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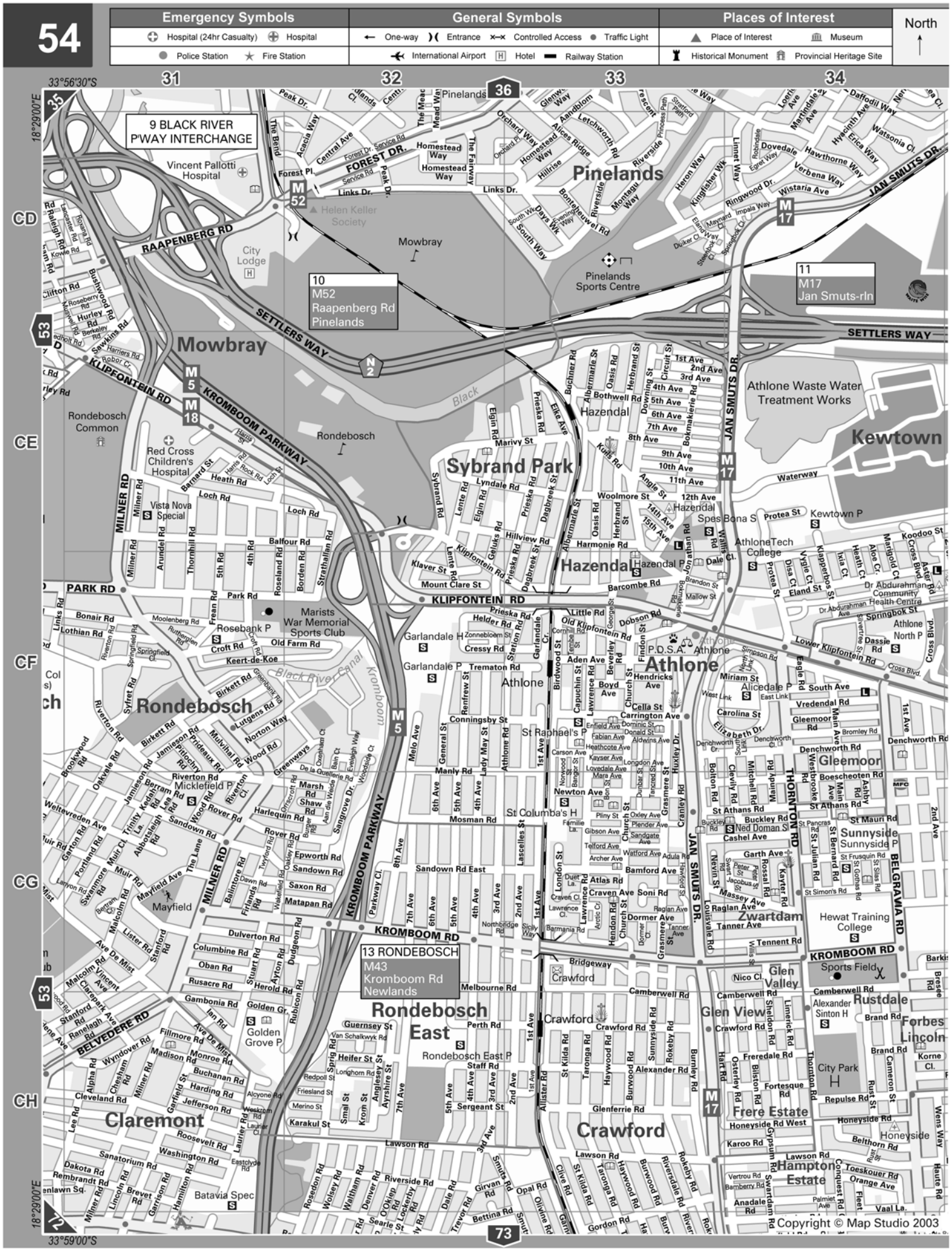
54
Emergency Symbols
Hospital (24hr Casualty)
Hospital
Police Station
Fire Station
General Symbols
One-way
Entrance
Controlled Access
Traffic Light
International Airport
Hotel
Railway Station
Places of Interest
Place of Interest
Museum
Historical Monument
Provincial Heritage Site
North
33°56'30"S
33°59'00"S
18°29'00"E
9 BLACK RIVER P'WAY INTERCHANGE
10 M52 Raapenberg Rd Pinelands
11 M17 Jan Smuts-rln
13 RONDEBOSCH M43 Kromboom Rd Newlands
Pinelands
Mowbray
Rondebosch
Sybrand Park
Hazendal
Athlone
Kewtown
Rondebosch East
Claremont
Crawford
Glen Valley
Rustdale
Gleemoor
Sunnyside
Zwartdam
Frere Estate
Hampton Estate
Athlone Waste Water Treatment Works
Vincent Pallotti Hospital
Red Cross Children's Hospital
City Lodge
Pinelands Sports Centre
Rondebosch Common
Marists War Memorial Sports Club
Hewat Training College
Sports Field
City Park
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Index to Street Names

Qagane Rd Rebecca Cr.

STREET NAME	SUBURB NAME	PG	GRID	
Q				
Qagane Rd	Browns Farm	75	CM	40
Qahawe St	Khayelitsha (Village 2a South)	92	CR	52
Qala Cl.	Khayelitsha (Town 3)	93	CR	58
Qamba Cr.	Khayelitsha	92	CR	51
Qamba Cr.	Khayelitsha (Village 3 South)	93	CQ	57
Qamela St	Khayelitsha (Village 2a South)	92	CS	54
Qampi Cr.	Khayelitsha (Village 4 North)	92	CO	52
Qanda St	Khayelitsha (Village 3 North)	93	CR	56
Qaqamba St	Khayelitsha (Village 4 South)	92	CQ	54
Qebengwana St	Khayelitsha	93	CP	56
Qete St	Khayelitsha	77	CM	50
Qhaga St	Khayelitsha (Village 2a South)	92	CS	53
Qhama St	Khayelitsha (Village 2a South)	92	CR	53
Qhekezana St	Khayelitsha	93	CQ	57
Qhela Cr.	Khayelitsha	93	CQ	57
Qhimgqoshe Rd	Philippi East	76	CL	46
Qhotyane Cl.	Philippi East	76	CM	46
Qhude Cr.	Joe Slovo Park	23	BU	34
Qhude St	Khayelitsha (Town 3)	93	CS	55
Qhula Cr.	Khayelitsha (Village 2a South)	92	CS	53
Qhwayela Cr.	Khayelitsha	93	CP	56
Qinqa St	Khayelitsha (Village 2a South)	92	CR	54
Qobo St	Khayelitsha (Village 1 South)	92	CQ	51
Qokelela St	Khayelitsha	93	CQ	56
Qokelwa Cr.	Victoria Merge	92	CO	51
Qomiliso Cr.	Victoria Merge	78	CN	52
Qonda St	Khayelitsha	93	CP	57
Qondani St	Khayelitsha (Village 1 North)	92	CP	51
Quail	Seawinds	103	CU	30
Quail Cr.	Robinvale	151	AJ	33
Quail Rd	Montagu's Gift	87	CO	33
Quail St	Eerstrivier	80	CM	60
Quality St	Maitland	36	CA	31
Quantock Rd	Sea Point	32	CA	18
Quantum	Tegnopark	64	CF	73
Quantum Villas	Skilpadvlei	17	BO	49
Quark	Stellenbosch	64	CG	73
Quarry Hill Rd	Tamboerskloof	33	CC	21
Quarry Rd	Fish Hoek	118	DA	22
Quarry Rd	Kalkbaai	119	DA	26
Quarry Rd	Simon's Town	132	DJ	24
Quarry Rd	Belrail	40	BY	49
Quarterdeck Rd	Kalkbaai	120	CZ	27
Quartz	Belthorn Estate	74	CL	36
Quasar Cr.	Surrey	55	CG	38
Qubaka Cr.	Khayelitsha (Village 2 North)	92	CP	54
Quebec Rd	Camps Bay	50	CE	18
Quebel Rd	Philippi	76	CL	45
Queen	Durbanville	17	BP	50
Queen Bess Rd	Lansdowne	73	CJ	32
Queen Guinevere St	Camelot	59	CF	53
Queen St	Mowbray	53	CD	29
Queen St	Paarl	145	BF	87
Queen St	Wellington	135	AT	93
Queen St	Zonnebloem (District Six)	34	CB	25
Queen Victoria Rd	Claremont	53	CH	29
Queen Victoria St	Central	34	CB	23
Queens Cl.	Table View	5	BN	34
Queens Cl.	Bloubergstrand	5	BN	34
Queens Cl.	Flintdale Estate	87	CO	31
Queens Dr.	Weltevreden Valley	90	CO	43
Queens Park Ave	Salt River	35	CC	27
Queens Rd	Rondebosch	53	CF	29
Queens Rd	Sea Point	32	CA	18
Queens Rd	Simon's Town	132	DJ	26
Queens Rd	Table View	5	BN	34
Queens Rd	Tamboerskloof	33	CB	21
Queens Rd	Woodstock	34	CB	26
Queens Way	Matroosfontein	38	CC	41
Queens Way	Pinelands	36	CB	33
Queens Way	Ruyterwacht	38	CA	39
Quellerie St	Welgemoed	27	BU	47
Quendon Rd	Sea Point	33	CA	19
Quercus	Cloetesville	47	BY	75
Quest Rd	Milnerton	23	BV	32
Quest Rd	Sanddrift	23	BV	34
Quick Rd	Lansdowne	73	CK	34
Quiet Cl.	Woodlands	90	CQ	44
Quiet St	Claremont	53	CH	28
Quigley Rd	Tijgerhof	23	BW	33
Quinan Rd	Somerset West	114	CU	73
Quince Cr.	Noordhaven	101	CX	19
Quince La.	Sir Lowry's Pass	123	CZ	81
Quince Rd	Gordon Strand	125	DD	76
Quincy Cr.	Norwood	38	CA	41
Quincy St	Khayelitsha (Village 4 South)	92	CP	53
Quintas	Bracken Heights	28	BU	54
Quintus Way	The Vines	86	CO	28
Qumatana	Mbekweni	138	AV	91
Qumba Cr.	Joe Slovo Park	23	BV	34
Qunube	Philippi East	77	CM	47
Qunube St	Browns Farm	76	CL	43
Qunube St	Khayelitsha (Town 3)	93	CS	55
Quoin Cr.	Strandfontein	106	CT	39
Ququzele St	Khayelitsha	93	CQ	57
Qwabe St	Victoria Merge	78	CN	51
Qwesha St	Khayelitsha (Village 3 North)	78	CN	53
R				
R101	Bloekombos	21	BQ	63
R101	Paarl	143	BD	95
R101 (Lady Grey St)	Dal Josafat Industrial Township	142	BC	89
R101 (Main Rd)		145	BJ	87
R101 (Old Paarl Rd)	De La Haye	27	BX	50
R101 (Old Paarl Rd)	Everite	29	BU	57
R101 (Old Paarl Rd)	Kaymor	28	BW	53
R101 (Old Paarl Rd)	Stikland Hospital	28	BW	52
R101 (Old Paarl Rd)		28	BW	54
R101 (Voortrekker Rd)	Bloekombos	20	BR	61
R102 (Albert Rd)	Woodstock	35	CB	27
R102 (New Market St)	Woodstock	34	CB	26
R102 (Old Main Rd)	Firgrove	96	CR	67
R102 (Strand Rd)	Labiance	41	BZ	52
R102 (Strand Rd)	Sanlamhof	40	BY	50
R102 (Van Riebeeck Rd)	Blackheath Industria	60	CE	56
R102 (Van Riebeeck Rd)	Kuilsrivier	41	CA	53
R102 (Van Riebeeck Rd)		80	CK	59
R102 (Van Riebeeck Rd)		113	CT	70
R102 (Voortrekker Rd)	Maitland	37	BZ	37
R102 (Voortrekker Rd)	Parow East	39	BY	44
R102 (Voortrekker Rd)	Vasco Estate	38	BZ	39
R102 (Voortrekker Rd)		40	BY	47
R27 (Marine Dr.)	Woodstock	35	CA	28
R27 (West Coast Rd)	Blouberg Rise	13	BO	31
R27 (West Coast Rd)		2	BC	27
R300 (Cape Flats Freeway)	Diepwater (Wesbank)	59	CF	51
R300 (Kuils River)	Kuilsrivier	41	BZ	53
R301 (Church St)		135	AR	95
R302 (Durban Rd)	Oakdale	27	BW	49
R302 (Durbanville Ave)	Eversdal Heights	17	BS	50
R303 (Piet Retief St)	Wellington	135	AT	93
R304	Stellenbosch	46	BZ	74
R304 (Charel Uys Dr.)	Atlantis	150	AE	31
R304 (Reygersdal Dr.)	Avondale	151	AH	32
R307 (Dassenberg St)	Atlantis	150	AG	30
R310 (Adam Tas Dr.)	Stellenbosch	64	CD	72
R310 (Baden Powell Dr.)	Stellenbosch	64	CD	71
R310 (Helshoogte Rd)	Stellenbosch	47	CA	77
R310 (Royal Rd)	Capricorn	103	CX	30
R44 (Adam Tas St)	Stellenbosch	46	CC	74
R44 (Broadway Blvd.)	Somerset West	97	CP	71
R44 (Broadway)	Langgewacht	114	CX	72
R44 (Champagne St)	Wellington	134	AS	91
R44 (Faure Marine Dr.)	Gordon Strand	125	DD	77
R44 (Faure Marine Dr.)	Greenways	121	DA	73
R44 (Main Rd)	Rome	121	CY	73
R44 (Main Rd)	Tarentaalplaas	114	CX	74
R44 (Main Rd)	Tarentaalplaas	115	CW	75
R44 (Strand)	Tegnopark	64	CF	74
R44 (Suid Agter Paarl)		144	BH	83
R45	Franschhoek South	149	CA	109
R45 (Berg River Blvd.)	Paarl	146	BF	89
R45 (Main Rd)	Courtrai	145	BH	88
R45 (Main Rd)	Paarl	145	BJ	87
R45 (Main)	Paarl	141	AZ	88
R45 (Malmesbury Rd)		137	AY	88
Raadt St	Kuilsrivier	41	CB	53
Raan St	Peerless Park East	19	BR	58
Raap St	Bellville South	40	CA	49
Raapenberg Rd	Mowbray	54	CD	31
Raapkraal Cr.	Kirstenhof	103	CU	27
Raapkraal Rd	Kirstenhof	103	CU	27
Raats Dr.	Table View	13	BO	31
Raats Dr.	Table View	14	BO	35
Rabbi Mirvish Ave	Vredehoek	34	CC	23
Rabie St	Paarl	145	BE	88
Rabie St	Park Estates	121	CY	72
Rabinowitz St	De Zoete Inval	145	BH	88
Race Course Rd	Durbanville	17	BQ	50
Race Course Rd	Lansdowne	73	CJ	32
Racecourse Rd	Marconi Beam	23	BU	34
Racecourse Rd	Milnerton	23	BT	33
Rachel Bloch Ave	Sonnedal	25	BV	42
Rachel Dick St	Cafda Village	87	CR	31
Rachel St	Avonwood	38	CB	42
Rada St	Khayelitsha (Town 1)	92	CO	52
Radar Cl.	West Beach	4	BL	30
Radar Rd	West Beach	4	BL	30
Radebe St	Sir Lowry's Pass	123	CZ	82
Radial Rd	Fairdale	78	CJ	54
Radiant Cl.	Heathfield	86	CR	29
Radloff Rd	Somerset West	114	CT	74
Radnor Rd	Parow Industria	39	CC	45
Radyn	Strand	121	CZ	73
Radyn St	Heemstede	28	BW	53
Raeburn St	De La Haye	41	BY	51
Rael St	Goedemoed	18	BO	54
Rael St	Tamboerskloof	33	CB	21
Rael St	Uitsig	18	BO	54
Raft Rd	Penlyn Estate	55	CH	35
Raglan Ave	Athlone	54	CG	34
Raglan Ave	Athlone	54	CG	33
Raglan St	Oakdale	27	BW	49
Rahad Way	Delft	58	CF	49
Railoun	Rusthof	121	DB	74
Railway Ave	Belrail	40	BY	49
Railway Ave	Bishop Lavis	57	CD	43
Railway Rd	Kuilsrivier	41	CB	53
Railway Rd	Montague Gardens Industrial	24	BT	36
Railway St	Parow East	39	BY	45
Railway St	Wellington	134	AR	92
Railway St	Woodstock	35	CA	27
Rainbow Cl.	Marconi Beam	23	BU	34
Rainbow La.	Silvertown	55	CF	36
Rainbow St	Pelikan Park	87	CQ	34
Rainbows End	Fairyland	143	AZ	93
Rainham La.	Woodstock	35	CC	27
Rajah Rd	Cravenby	39	CA	43
Raleigh	Park Estates	114	CX	71
Raleigh Rd	Mowbray	53	CD	30
Ralph Cr.	Kuilsrivier	41	CA	54
Ralph St	Hoogstede	28	BV	53
Ralph St	Claremont	53	CH	28
Ralph St	Florida	39	CA	44
Raluathi	Philippi East	77	CK	50
Rambler Rd	Plumstead	86	CP	29
Rambler St	Beacon Valley	91	CQ	47
Ramenas Cl.	Perm Gardens	79	CJ	58
Ramenas Sq.	Roosendaal	59	CF	52
Rameron Ave	Imhoff's Gift	117	DB	16
Ramokolo St	Khayelitsha (Village 4 North)	92	CO	52
Ramola Ave	Gatesville	55	CH	36
Ramone Ave	Riverton	38	BZ	40
Ramone Rd	Nyanga	76	CK	43
Ramphal Singh St	Cravenby	39	CB	43
Ramsey Rd	Rondebosch	53	CF	29
Ranch Rd	Rocklands	90	CS	45
Rancke Rd	Bloubergstrand	4	BL	28
Rand	Stellenbosch	47	CB	75
Rand Rd	Blackheath Industria	60	CG	56
Rand Rd	Heathfield	86	CR	29
Rand Rd	Vierlanden	18	BO	51
Rand St	Chrismar	27	BW	50
Rand St	Wellington	139	AW	93
Ranee St	Cravenby	39	CA	43
Ranelagh Rd	Claremont	53	CH	30
Ranelagh Rd	Rondebosch	54	CH	31
Ranelagh St	Oakdale	27	BW	49
Range Rd	Blackheath Industria	60	CF	56
Range Rd	Lansdowne	73	CK	33
Range Rd	The Range	38	CC	41
Range Rd	Wimbledon	60	CE	55
Ranger Cl.	Mitchells Plain	90	CQ	45
Ranger Cr.	Elfindale	86	CQ	29
Ranger Rd	Fish Hoek	118	DA	21
Ranger Rd	Fish Hoek	119	DB	23
Ranisi Dr.	Joe Slovo Park	23	BU	34
Rankie Rd	Retreat	86	CS	29
Rankin Rd	Edgemead	25	BT	39
Rankine St	Strand Halt	114	CX	74
Rankine St	Tarentaalplaas	114	CX	74
Ranksuikerbos	Welgedacht	26	BT	46
Ranonkel St	Firgrove	96	CR	67
Ranonkel St	Wellington	134	AT	92
Ranunculus St	Kalksteenfontein	56	CE	40
Ranzadale St	Wellington	135	AS	95
Raphael Cr.	Stellenberg	28	BU	51
Rapide St	Factreton	37	BY	35
Raptide	Rocklands	90	CS	46
Rarabe Ave	Hout Bay	83	CO	16
Rascke	Paarlzicht	142	BB	91
Rastede Cl.	Woodbridge Island	23	BW	31
Ratanga Rd	Century City	23	BX	33
Ratanga Rd	Sanddrift	23	BV	34
Ratel	Kuilsrivier	41	CC	53
Ratel Cl.	Eastridge	91	CR	48
Ratelklip St	Chapman's Peak	100	CW	15
Rathfelder Ave	Constantia	71	CM	24
Rathgar Rd	Oakdale	27	BW	49
Rathmine St	Oakdale	27	BX	48
Ratling Rd	Fresnaye	33	CB	19
Rattray	Stellenbosch	47	CC	77
Ravel	Delft South	77	CK	48
Ravel St	Steenberg	103	CT	29
Raven Cl.	Blouberg Rise	4	BN	30
Raven St	Blouberg Rise	4	BN	30
Raven St	Grassy Park	87	CQ	33
Raven St	West Beach	4	BN	30
Ravens Cl.	Ottery	74	CL	35
Ravensberg Ave	Newlands	53	CH	27
Ravenscourt	Parklands	5	BN	32
Ravenscourt Cl.	Parklands	5	BN	32
Ravenscraig Rd	Greenpoint	33	BZ	21
Ravenscraig Rd	Woodstock	34	CB	26
Ravensmead St	Ravensmead	39	CA	45
Ravensmead St West	Ravensmead	39	CB	44
Ravensteyn Rd	Bakoven	51	CF	19
Ravenswood Rd	Parklands	5	BN	33
Ravensworth Rd	Claremont	72	CJ	29
Ravine Rd	Bantry Bay	32	CB	18
Ravine St	Tafelsig	91	CR	48
Ravine Steps	Fish Hoek	119	DB	24
Ravlee St	Brackenfell	29	BV	56
Rawbone Rd	Sir Lowry's Pass	123	CZ	81
Rawbone St	Greenpoint	33	BZ	22
Rawe Cl.	Khayelitsha (Town 1)	92	CP	52
Rawson St	Observatory	35	CC	29
Ray Alexander St	Manenberg	56	CH	40
Ray Cl.	Bellville	27	BT	50
Ray Cl.	Bellville	28	BU	51
Ray St	Bishop Lavis	57	CE	44
Ray St	Macassar	95	CS	65
Rayden St	Gardens	33	CC	22
Raymond Ackerman Ave	Kleinvlei	80	CJ	59
Raymond Ackerman Ave	Park Village	79	CK	58
Raymond Cir.	Montagu's Gift	87	CO	34
Raymond Cr.	Duynefontein	2	AY	26
Raymond Mhlaba Cr.	Khayelitsha (Village 4 South)	92	CQ	54
Raymond St	Brackenfell South	29	BX	58
Raymond Stuttney Cr.	Khayelitsha	93	CP	55
Rayner Rd	Surrey	55	CH	37
Raziet	Cloetesville	47	BZ	75
Reactor St	Triangle Farm	40	BY	50
Read St	Ottery East	73	CN	34
Reagon Cr.	Bridgetown	55	CE	36
Reaper Green	Summer Greens	24	BW	35
Rebecca Cl.	Langeberg Glen	19	BP	56
Rebecca Cr.	De Tuin	19	BS	56

Index to Street Names

Rebecca Cr. Ripple Cl

STREET NAME	SUBURB NAME	PG	GRID
Rebecca Cr.	Lentegeur	91	CO 48
Recife Cr.	Strandfontein	105	CT 38
Recreation Rd	Eikendal	20	BS 59
Recreation Rd	Fish Hoek	119	DB 24
Recreation Rd	Muizenberg	103	CX 30
Red Cross Dr.	Strandfontein	106	CU 41
Red Hill Rd	Simon's Town	128	DH 22
Red Hill Rd	Simon's Town	129	DG 23
Red Hill Rd	Simon's Town (Red Hill)	131	DJ 22
Red Oak La.	Green Oaks	47	BY 75
Red River Cr.	Manenberg	75	CJ 39
Red River St	Manenberg	75	CJ 39
Red River Wk	Manenberg	75	CJ 39
Red Roman Way	Marina Da Gama	103	CU 29
Red Rose	Wimbledon	60	CG 55
Redberry Cl.	Langa	56	CF 39
Redberry St	Langa	56	CE 39
Redcliffe	Parklands	5	BN 33
Redcliffe Cl.	Parklands	5	BN 32
Reddam Ave	Westlake Estate	102	CT 24
Reddy Ave	Grassy Park	87	CQ 32
Redgum	Rosedale	80	CL 59
Redgum Ave	Thornton	37	CA 37
Redhawk	Pelikan Park	88	CQ 35
Redlands Rd	Milnerton	23	BV 32
Redonda Ct	Sherwood	151	AG 33
Redpoll St	Rondebosch East	54	CH 32
Redthorn	Langa	56	CE 39
Redwood Cl.	Belhar	40	CC 47
Redwood Cl.	Edenpark	28	BU 54
Redwood Cl.	Northpine	29	BU 58
Redwood Rd	Weltevreden Valley	90	CO 43
Redwood St	Bellair	28	BW 52
Reeb Rd	Macassar	95	CS 66
Reeb Rd	Macassar	112	CT 66
Reed St	Belhar	58	CD 49
Reed St	Belrail	40	BY 49
Reef Rd	Vanguard	55	CG 38
Reen Ave	Newfields	55	CH 37
Reenberg Rd	Bishop Lavis	56	CE 42
Reenen Ct	Edgemead	25	BT 39
Refinery Rd	Paarden Eiland	35	BZ 28
Reflector St	Saxonsea	151	AF 32
Reform Cl.	Belhar	59	CD 51
Reform Rd	Rondebosch	53	CG 28
Reform St	Zonnebloem (District Six)	34	CB 24
Regan Cl.	Valhalla Park	56	CF 42
Regent	Parklands	13	BO 33
Regent Circus	Tamboerskloof	33	CB 21
Regent Rd	Parklands	5	BN 33
Regent Rd	Parklands	13	BO 33
Regent Sq.	Woodstock	35	CB 27
Regent St	Durbanville	17	BP 49
Regent St	Klippiesdal	142	BC 91
Regent St	Malibu Village	79	CK 55
Regent St	Sea Point	33	CA 19
Regent St	Wellington	134	AR 92
Regent St	Weltevreden Valley	89	CO 42
Regent St	Woodstock	35	CB 27
Regents Park Dr.	Noordhoek Manor	101	CX 21
Reggie Hadebe	Weltevreden Valley	75	CN 42
Reggie September St	Khayelitsha (Village 2b)	92	CS 52
Regiment Way	Door De Kraal	27	BT 47
Regina Way	Pinelands	37	CB 35
Regis Green	Summer Greens	24	BV 36
Regis Rd	Fragmoor Estate	103	CU 28
Reid St East	Fairfield	26	BX 44
Reid St West	Fairfield	26	BX 44
Reids Way	Simon's Town	129	DF 24
Reier St	Okavango Park	29	BT 57
Reiger Ave	Somerset West	115	CU 77
Reiger Rd	Ruyterwacht	38	BZ 39
Reiger Rd	Stellenberg	28	BU 51
Reiger St	Melkboschstrand	2	BB 26
Reigersdal Rd	Platteklooof Glen	25	BW 40
Reijger Ave	Belhar	58	CD 50
Reijger Cr.	Belhar	58	CD 50
Reilingen La.	Sunset Glen	59	CH 54
Reindeer	Diepwater (Wesbank)	59	CF 52
Reinders St	Wellington	135	AR 95
Reinhardt Moolman Cl.	Parow North	25	BX 42
Reits	Morgenster Hoogte	29	BT 56
Reitz Cl.	Somerset Park	115	CW 75
Reitz Rd	Tijgerhof	23	BW 32
Reitz St	Northern Paarl	138	AY 89
Reitz St	Northern Paarl	142	AZ 89
Reitz St	Parow North	25	BW 42
Reitz St	Somerset Park	115	CW 75
Reitz St	Somerset West	114	CU 74
Rembrandt Ave	De La Haye	41	BY 51
Rembrandt Ave	De La Haye	28	BX 51
Rembrandt Ave	Macassar	95	CS 66
Rembrandt Cr.	De Duin	25	BV 41
Rembrandt Cr.	Forset Glade	80	CK 59
Rembrandt Cr.	Malibu Village	79	CJ 55
Rembrandt Rd	Claremont	54	CH 31
Rembrandt Rd	Somerset West	97	CR 74
Rembrandt Rd	Somerset West	98	CR 75
Rembrandt Rd	Sonstraal	18	BR 52
Rembrandt Rd	Welcome	55	CF 38
Rembrandt St	Scottsville	19	BS 57
Remhoogte Rd	Somerset West	96	CS 70
Remhoogte St	Voorbrug	58	CG 50
Remington Rd	Wynberg	72	CL 28
Remus St	Somerset West	115	CV 77
Remus St	Strandfontein	107	CT 43
Rendevous Cr.	Voorbrug	58	CG 50
Rendezvous St	Somerset West	97	CR 71
Rendlesham La.	Sherwood	151	AG 33
Rene St	Courtrai	145	BH 87
Rene St	De Tijger	26	BW 44
Renee Cl.	Belville	28	BV 51
Rene? Ave	Flintdale Estate	87	CP 31
Renfrew Cl.	Heathfield	86	CQ 29
Renfrew St	Athlone	54	CF 32
Renoir St	Labiance	41	BZ 52
Renoster Cr.	Eastridge	91	CR 48
Renoster Rd	Manenberg	75	CJ 39
Renoster St	Delft	58	CG 49
Renoster Wk	Manenberg	75	CJ 39
Renosterbos	Lentegeur	91	CO 47
Renosterbos Pl.	Leonsdale	38	BZ 41
Renostervodl La.	Robinvale	151	AJ 33
Rens St	Onverwacht	121	CZ 73
Rensche St	Somerset West	97	CS 74
Rentia St	Northern Paarl	142	AZ 89
Repens	Anesta	65	CF 75
Repulse Rd	Belgravia	54	CH 34
Repulse Rd	Penlyn Estate	55	CH 35
Resandon Ave	Fresnaye	33	CA 19
Reservoir Rd	Kenridge Heights	17	BS 49
Reservoir Rd	Somerset Park	115	CW 75
Reservoir Rd	Somerset West	115	CT 76
Reservoir St	Franschhoek South	149	BZ 108
Reservoir St	Ruwari	29	BV 58
Residence Rd	Rondebosch	53	CF 28
Residentia Ave	Somerset West	115	CT 78
Resthaven Dr.	Tokai	85	CS 26
Restia Cl.	Gordon Heights	125	DE 78
Restio Cr.	Westlake Estate	102	CU 25
Reston Way	Edgemead	24	BU 38
Retief La.	Fish Hoek	119	DB 23
Retief St	Sunray	27	BX 49
Retief St	Northern Paarl	138	AY 89
Retief St	Northern Paarl	141	AZ 88
Retreat	Kayamandi	46	CA 74
Retreat Rd	Cafda Village	86	CR 30
Retreat Rd	Retreat	86	CS 29
Retzia Rd	Hoheizen	27	BV 47
Reuben Kaye Rd	Parow Industria	57	CD 45
Reunion Mews	Capri	118	DB 19
Reuter St	Kuilsrivier	41	CB 53
Reuter St	Kuilsrivier	59	CD 53
Rev.Calata Cr.	Khayelitsha (Village 3 South)	93	CQ 56
Rev.Marawu Cr.	Khayelitsha (Village 4 South)	93	CQ 55
Rev.Stofile St	Khayelitsha (Village 4 South)	92	CQ 54
Revel Fox Cl.	Guguletu	75	CJ 41
Rex St	Somerset West	115	CV 77
Reyger	Simonswyk	47	CB 78
Reyger Rd	Thornton	37	CB 37
Reyger St	Bothasig	24	BT 37
Reygersdal Ave	Strandfontein	107	CT 43
Reygersdal Cl.	Strandfontein	107	CT 44
Reygersdal Dr.	Avondale	150	AH 31
Reygersdal Dr.	Protea Park	151	AJ 32
Reygersdal Dr.	Atlantis	153	AM 34
Reygersdal St	Dennemere	60	CH 57
Reyneke St	Lemoenkloof	141	BC 88
Reynolds St	De La Haye	27	BX 50
Rhaboksberg St	Tafelsig	91	CR 49
Rhanisi Rd	Philippi East	77	CL 47
Rhapsody St	Dalvale	138	AU 90
Rhapsody St	Dalvale	142	AZ 90
Rheazicht Rd	Ridgeworth	27	BV 50
Rhebok Cl.	Loevenstein	26	BW 46
Rheebok	Wellington	134	AS 90
Rheebok Cr.	Scottsdene	30	BT 60
Rheebok St	Scottsdene	30	BT 59
Rheede St	Gardens	33	CB 22
Rheede St	Welgemoed	26	BV 46
Rheezicht	Karindal	48	CC 79
Rheezicht	Pinelands	37	CC 35
Rheezicht Cl.	Mitchells Plain	90	CQ 45
Rhemus St	Phoenix	23	BU 34
Rhenius Rd	Bishop Lavis	57	CD 43
Rhine Cl.	Portlands	90	CQ 46
Rhine Rd	Bishop Lavis	56	CD 41
Rhine Rd	Eindhoven	58	CH 50
Rhine Rd	Sea Point	33	BZ 20
Rhino St	Ocean View	117	DC 15
Rhintyela St	Khayelitsha	93	CQ 57
Rhoda St	Rome	114	CX 73
Rhode	Cloetesville	47	BY 75
Rhode Vos Rd	Hout Bay Harbour	82	CR 14
Rhodes	Kenridge	17	BS 48
Rhodes Ave	Constantia	71	CL 23
Rhodes Ave	Croydon	95	CP 64
Rhodes Ave	Mowbray	53	CD 29
Rhodes Ave	Newlands	52	CH 26
Rhodes Ave	Woodstock	35	CC 27
Rhodes Ave	Glen Alpine	70	CM 21
Rhodes Cl.	Belhar	58	CD 49
Rhodes Dr.	Bel Ombre	71	CL 23
Rhodes Dr.	Bishopscourt	71	CJ 25
Rhodes Dr.	Mowbray	53	CE 28
Rhodes North	Die Boord	65	CE 75
Rhodes South	Fairways	65	CE 75
Rhodes St	Goodwood Estate	25	BX 39
Rhodes St	Goodwood Estate	38	BY 39
Rhodes St	Langa	55	CD 36
Rhodes St	Somerset West	115	CW 75
Rhodesia Rd	Muizenberg	103	CX 29
Rhodesia St	Woodstock	35	CB 27
Rhone	Pinelands	37	CC 35
Rhone Cl.	Die Bos	121	CY 74
Rhone St	Lemoenkloof	142	BB 89
Rhone Way	Manenberg	74	CJ 38
Rhone Way	Mitchells Plain	90	CR 44
Rhos St	Bellville	27	BX 47
Rhus St	Gordon Heights	125	DE 78
Rhynheath Way	Elfindale	86	CQ 30
Ria Ave	Brackenfell	29	BV 57
Rialto	Park Estates	121	CZ 72
Ribbok	Kuilsrivier	41	BZ 54
Ribbok Rd	Goedemoed	18	BO 54
Ribbok St	Eastridge	91	CR 48
Ribbok St	New Orleans	142	BB 92
Ribbok St	Ruwari	29	BV 57
Ribbok St	Somerset Heights	79	CJ 57
Ribbok Way	Fish Hoek	119	DB 24
Ribbokskloof Cl.	Mitchells Plain	90	CS 44
Rica Louw Ave	Barbarossa	86	CO 28
Ricardo Rd	Lansdowne	73	CJ 34
Rice La.	Fish Hoek	119	DB 24
Rice St	William Lloyd	142	BD 92
Richard Allen St	Adriaanse	39	CC 43
Richard Cr.	Valhalla Park	56	CE 41
Richard Lakey Rd	Lotus River	87	CQ 34
Richard Rd	Sunnydale	118	DA 19
Richard Ridgill Ave	Sir Lowry's Pass	123	CZ 81
Richard St	Groenvlei	141	BA 88
Richard St	Morgenster Hoogte	29	BT 55
Richelieu St	Eversdal Heights	27	BT 50
Richelieu St	Courtrai	145	BH 87
Richelieu St	Everglen	17	BS 50
Richelieu St	Wellington	135	AR 95
Richmond	Noordhoek Manor	101	CX 21
Richmond Ave	Elriche	142	BB 90
Richmond Ave	Pinelands	36	CB 34
Richmond Cl.	Edgemead	24	BU 38
Richmond Cl.	Sweet Valley	85	CQ 26
Richmond La.	Capricorn	103	CW 30
Richmond Pl.	West Beach	4	BN 30
Richmond Rd	Kenilworth	72	CK 29
Richmond Rd	Mowbray	53	CD 30
Richmond Rd	Oakdale	27	BW 49
Richmond Rd	Three Anchor Bay	33	BY 21
Richmond Rd	West Beach	4	BN 30
Richmond St	Nomzano	122	CY 76
Richmond St	Richmond Estate	25	BX 40
Richmond St	Richmond Estate	38	BY 40
Richmond St	Ruyterwacht	38	CA 39
Richmond Way	Sweet Valley	85	CQ 26
Richter Ave	Somerset West	97	CS 72
Richter Ave	Wellington	135	AT 94
Richter St	Uitsig	19	BO 55
Richwood Ave	Richwood	14	BP 38
Richwood Cr.	Diepwater (Wesbank)	59	CF 52
Rickard La.	Fish Hoek	119	DB 23
Ricketts Cl.	Simon's Town	132	DJ 24
Ricketts Rd	Clamhall	26	BX 43
Ridderspoor	Blomtuin	28	BW 51
Rider Haggard St	Tijgerhof	23	BW 32
Riders Green	Summer Greens	24	BW 36
Ridge Ct	Rocklands	90	CS 45
Ridge La.	Somerset West	98	CS 77
Ridge Rd	Bergsig	18	BO 51
Ridge Rd	Langeberg Ridge	19	BR 56
Ridge St	Tafelsig	91	CR 48
Ridge Way	Pinelands	36	CC 33
Ridge Wk	Constantia	71	CK 24
Ridgedale Cr.	Constantia	85	CP 25
Ridgemoor St	Voorbrug	58	CG 50
Ridgeview Cl.	Northpine	29	BU 58
Ridgeway	Townsend Estate	24	BX 37
Ridgeworth Dr.	Ridgeworth	27	BV 50
Ridgill La.	Somerset West	115	CV 75
Ridgull St	Onverwacht	121	CZ 74
Riebeeck St	Goodwood Estate	38	BY 39
Riebeeck St	Wynberg	72	CL 28
Riebeeck St	Goodwood Estate	25	BX 39
Riebeek La.	Central	34	CA 23
Riebeek St	Belhar	58	CD 50
Riebeek St	Tygerdal	25	BX 39
Riesling	Fairways	65	CE 75
Riesling	Goedemoed	10	BN 53
Riesling	Oude Westhof	26	BT 45
Riesling Rd	Saxenburg Industrial Park	60	CE 57
Riesling Rd	The Vines	86	CO 27
Riesling St	Paarl	145	BE 88
Riesling St	Somerset West	97	CR 71
Riesling St	Wellington	135	AT 94
Riet Cl.	Delft	58	CG 49
Riet St	Eerstrivier	80	CM 59
Riet St	Brackenfell South	29	BX 56
Rietbok Ave	Lotus River	88	CQ 35
Rietbok Cr.	Eastridge	91	CR 48
Rietbok Rd	Langeberg Ridge	19	BR 56
Rietbok St	Durbanville	17	BQ 49
Rietbok St	New Orleans	142	BB 92
Riethaan	Rocklands	90	CS 44
Rietpoel	Diepwater (Wesbank)	59	CF 52
Rietsanger La.	Robinvale	151	AJ 33
Rietvlei Ave	Bothasig	15	BS 39
Rietvlei Rd	Kuilsrivier	41	CB 53
Riffel Cl.	Franschhoek North	148	BW 105
Rifle Range Rd	Thornton	37	CA 36
Rifle Rd	Lansdowne	73	CL 33
Rifstone Rd	Lavender Hill	104	CT 31
Rigel Rd	Lansdowne	73	CK 34
Rigel Rd	Ocean View	117	DC 15
Rigel St	Somerset West	115	CV 77
Rigoletto Cl.	Scottsdene	30	BT 59
Rigoletto Cr.	Eastridge	91	CQ 49
Riley Cr.	Beacon Valley	91	CQ 48
Riley St	Beaconvale	39	CA 44
Riley St	Klipkop	39	BZ 45
Riley St	Parowvallei	39	CA 43
Rimini St	Morgenster Hoogte	29	BT 56
Ring	Cape Town Int. Airport	57	CG 44
Ring Ave	Macassar	95	CS 64
Ring Ave	Macassar	112	CT 64
Ring Cr.	Kuilsrivier	41	CA 53
Ring Cr.	Penlyn Estate	74	CJ 36
Ring Rd	Refinery	14	BR 38
Ring Rd	Refinery	15	BR 39
Ringwood Cl.	Constantia	71	CM 24
Ringwood Dr.	Parklands	5	BM 33
Ringwood Dr.	Pinelands	36	CC 34
Ringwood Dr.	Pinelands	37	CB 35
Ringwood Dr.	Pinelands	54	CD 34
Ringwood St	Diepwater (Wesbank)	59	CE 52
Rinquest	William Lloyd	142	BD 92
Rio Ave	Malibu Village	79	CL 56
Rio Grande St	Manenberg	75	CJ 39
Rio Grande Wk	Manenberg	75	CN 40
Rio Rd	Melkboschstrand	2	BC 26
Riparia St	Groenvlei	141	BA 88
Ripelby Rd	Claremont	72	CJ 28
Ripple Cl.	Rondebosch	53	CG 27

Index to Street Names

Risedale Rouen Ave

STREET NAME	SUBURB NAME	PG	GRID	
Risedale	Paarl	145	BE	88
Risedale	Highbury	59	CE	54
Risi Rd	Fish Hoek	118	DA	21
Rispel St	Kylemore	49	BZ	86
Rissik St	Beaconvale	39	CA	43
Rissik St	Parowvallei	39	BZ	43
Rita St	Montagu's Gift	87	CO	34
Rita St	Tafelsig	91	CS	50
Ritchie Ave	Kenilworth	72	CK	30
Ritchie St	Woodstock	35	CC	27
Ritter St	Strand	121	CZ	73
Ritters Rd	Belthorn Estate	73	CJ	34
River Cl.	Chapman's Peak	100	CX	18
River Cr.	Eerstrivier	80	CL	59
River Rd	Bishop Lavis	56	CD	41
River St	Brooklyn	35	BZ	30
River St	Rosebank	53	CE	30
Riverine Cl.	Table View	5	BN	34
Rivers End Rd	Plumstead	72	CN	28
Riversdale Cl.	Portlands	90	CS	46
Riversdale Rd	Brooklyn	35	BY	30
Riversdale Rd	Crawford	54	CH	33
Riversdale Rd	Crawford	73	CJ	33
Riversdale Way	Portlands	90	CS	46
Riverside	Pinelands	54	CD	33
Riverside Ave	Winslow	125	DD	77
Riverside Cl.	Klein Wassenaar	103	CW	27
Riverside Dr.	Kommetjie	116	DB	13
Riverside Rd	Bishopscourt	52	CH	26
Riverside Rd	Bishopscourt	71	CJ	26
Riverside Rd	Fish Hoek	118	DA	22
Riverside Rd	Lansdowne	54	CH	32
Riverside Rd	Lotus River	87	CP	34
Riverside Rd	Lotus River	88	CQ	35
Riverside Rd	Rondebosch	53	CF	29
Riverside Rd	Somerset West	115	CV	75
Riverside St	Kylemore	49	BZ	86
Riverside St	William Lloyd	143	BD	94
Riverside Ter.	Hout Bay	69	CN	16
Riverstone	Hout Bay	83	CP	17
Riverstone Rd	Wynberg	72	CK	28
Riverton Cr.	Ruyterwacht	38	BZ	40
Riverton Cl.	Riverton	38	BZ	40
Riverton Cl.	Rondebosch	54	CG	31
Riverton Cr.	Riverton	38	BZ	40
Riverton Rd	Rondebosch	54	CF	31
Riverton Rd	Somerset West	114	CW	72
Riverton St	Kuilsrivier	41	CB	53
Riviera Rd	Claremont	72	CJ	28
Riviera Way	Portlands	91	CR	47
Riviersonderend St	Eerstrivier	80	CJ	60
Roan Ave	Hout Bay	70	CM	19
Roan Rd	Lotus River	88	CQ	35
Roath St	Lansdowne	73	CK	32
Rob St	Macassar	95	CS	64
Robben Rd		2	BB	26
Robert Ave	Lotus River	87	CP	34
Robert Carr Ave	Dennedal	85	CS	26
Robert McBride St	Khayelitsha (Village 4 South)	92	CQ	54
Robert Rd	Winsorpark	19	BS	56
Robert Sobukhwe	Weltevreden Valley (Robert Sobukhwe)	75	CN	42
Robert St	Kuilsrivier	42	CC	56
Robert St	Gaylee	60	CG	57
Robert St	Saxonsea	151	AF	32
Roberts Ave	Ravensmead	39	CA	44
Roberts Rd	Woodstock	35	CB	27
Robertson La.	Retreat	86	CS	29
Robertson Rd	Brooklyn	35	BZ	30
Robertson St	Glenlily	39	BY	43
Robertson St	Mountain Veiw	142	BB	91
Robertsz	Brandwacht	65	CE	76
Robie Robertson La.	Boschenmeer Estate	146	BG	90
Robin	Rocklands	90	CS	45
Robin Cir.	Ocean View	117	DC	15
Robin Cr.	Penlyn Estate	55	CH	36
Robin Ct	Bridgetown	55	CE	36
Robin La.	Bergvliet	86	CQ	27
Robin Rd	Bishop Lavis	57	CE	43
Robin Rd	Milnerton	23	BV	32
Robin Rd	Montagu's Gift	87	CO	32
Robin St	Kleinvlei	79	CJ	58
Robin St	Somerset West	98	CS	76
Robin St	Valhalla Park	56	CE	41
Robina Rd	Gordon Strand	125	DD	76
Robindale	Pinelands	54	CD	34
Robins Rd	Observatory	35	CC	28
Robinson Ave	Bishopscourt	71	CJ	26
Robinson Ave	Hout Bay	68	CM	14
Robinson Cr.	Tafelsig	91	CS	49
Robinson Rd	Kenilworth	72	CK	29
Robinson St	Vergesig	17	BQ	48
Robinson Way	Edgemead	24	BT	38
Robor Cr.	Mowbray	54	CE	31
Robyn Cr.	Welgelegen	25	BT	40
Robyn Park Cl.	Langeberg Ridge	19	BR	55
Robyn Rd	Langeberg Ridge	19	BR	55
Robyn St	Forest Heights	79	CL	58
Robyn St	Morgenster Hoogte	29	BT	55
Rocastle	Highbury	59	CD	54
Rochea	Hout Bay	82	CO	14
Rochefort Cl.	La Rochelle	28	BX	52
Rochefort Pl.	Somerset West	114	CT	74
Rochelle Way	Northpine	30	BU	59
Rochester Rd	Heathfield	86	CQ	29
Rochester Rd	Observatory	35	CC	28
Rochester Rd	Philippi	76	CL	45
Rochester Rd	Sea Point	32	CA	18
Rochester Rd	West Beach	4	BM	29
Rock Rd	Rondebosch	54	CE	31
Rockdale Ct	Ocean View	117	DC	15
Rocket La.	Khayelitsha	77	CL	49
Rockford Rd	Lansdowne	73	CK	33
Rockford Rd	Lotus River	87	CQ	34
Rockhill Way	Retreat	103	CT	29
Rockies Cir.	Tafelsig	91	CS	47
Rockies Cr.	Tafelsig	91	CS	48
Rocklands Ave	Vredehoek	52	CD	23
Rocklands Rd	Murdock Valley	133	DL	28
Rocklands Rd	Sea Point	33	BZ	20
Rockley Rd	Wynberg	72	CM	29
Rocktree Cl.	Sonstraal Heights	18	BQ	54
Rocky	Eerstrivier	80	CL	59
Rocky Cl.	Salberau	38	CA	41
Rod La.	Lotus River	88	CP	35
Rodded Rd	Scottsdene	39	BU	59
Roderick Way	Constantia	85	CO	25
Rodger St	Durbanville	18	BQ	51
Rodgers Ave	Constantia	85	CQ	25
Rodgers St	Wellington	138	AU	92
Roding Cl.	Epping Forest	38	CB	41
Rodney St	Russel's Rest	80	CL	59
Rodwell Rd	St James	120	CZ	28
Roela	Welgedacht	26	BT	45
Roeland St	Gardens	34	CB	23
Roeland Ter.	Central	34	CB	23
Roella Cl.	Perm Gardens	80	CJ	60
Roelofse St	The Palms	114	CX	73
Roer	Jagtershof	42	CC	57
Roger St	Gaylee	60	CH	57
Roger St East	Zonnebloem (District Six)	34	CB	25
Rogers St	Danena	27	BU	49
Roggebaai Sq.	Central	34	CA	24
Roggeberg Rd	Langa	56	CF	42
Roggeland Rd	Paarl	138	AX	92
Roggeland Rd	Paarl	139	AX	93
Rogland St	Morgenster Hoogte	29	BU	55
Rohm Rd	Goodwood Estate	37	BY	38
Rohrer St	Protea Hoogte	29	BW	57
Rokeby Rd	Crawford	54	CH	33
Rokeby Rd	Crawford	73	CJ	33
Roker Cl.	Blackheath Industria	60	CG	57
Rokewood	Die Boord	64	CD	74
Rokewood	Die Boord	65	CD	75
Rolbal Cr.	Beacon Valley	91	CP	48
Rolen Cr.	Belgravia	55	CG	35
Rolfontien Rd	Edgemead	24	BU	38
Rolinda Cr.	Jamestown	64	CH	74
Rolisusu Cr.	Victoria Merge	78	CN	52
Roller La.	Robinvale	151	AJ	33
Roma Ct.	Dennemere	60	CH	58
Roman La.	Hout Bay Harbour	82	CR	13
Roman Pl.	Woodlands	90	CP	45
Roman Rd	Eerstrivier	80	CM	60
Roman Rd	Observatory	35	CC	28
Roman Rd	Skoongesig	17	BO	50
Romany Wk	Constantia	85	CQ	24
Romelia Cr.	Blue Downs	79	CJ	56
Romelia Way	Plattekloof Glen	25	BW	40
Romney Rd	Greenpoint	33	BZ	21
Romney St	De La Haye	41	BY	51
Rompe St	Lansdowne	73	CK	33
Romulus St	Phoenix	23	BU	34
Romulus St	Somerset West	115	CV	77
Romulus St	Strandfontein	107	CT	43
Ronald Rd	Camps Bay	50	CE	18
Rondeberg Cr.	Bonnie Brae	19	BP	57
Rondeberg Rd	Bishop Lavis	57	CE	43
Rondeberg Rd	Langa	56	CF	42
Rondeheuwel Cr.	Beaconhill	151	AH	34
Rondo La.	Mitchells Plain Centre	91	CQ	47
Ronell Cr.	Plumstead	86	CP	29
Ronelle La.	Brackenfell South	29	BX	58
Ronleigh Rd	Muizenberg	103	CX	29
Rontree Ave	Bakoven	50	CF	18
Rontree Cl.	Bakoven	50	CF	18
Roodeberg Ave	KWV	145	BF	88
Roodeberg St	Tafelsig	91	CS	49
Roodebloem Rd	Woodstock	35	CB	27
Roodehek St	Gardens	34	CB	23
Roodehek St	Voorbrug	58	CG	50
Roodekranz Rd	Townsend Estate	24	BX	38
Roodezand Rd	Belhar	58	CD	50
Roodt	Aurora	17	BO	49
Rooi Cl.	Bloekombos	21	BR	63
Rooi Els Ave	New Orleans	142	BA	90
Rooi Karee St	Springbok Park	28	BV	54
Rooi St	Kylemore	49	BZ	86
Rooibekkie	Joostenberg	20	BQ	60
Rooibekkie St	Robinvale	151	AJ	33
Rooiberg	Wellington	138	AV	91
Rooiberg Cl.	Beaconhill	151	AH	34
Rooiberg Cr.	Bonnie Brae	19	BP	57
Rooiberg Cr.	Greenfield	79	CJ	56
Rooiberg Cr.	Langa	56	CF	39
Rooibok	Kuilsrivier	41	BZ	54
Rooibok St	Scarborough	130	DK	18
Rooibok St	Wellington	138	AU	90
Rooiborsie St	Amstelhof	143	BD	93
Rooiels	Delft South	77	CJ	50
Rooiels	Plattekloof	26	BV	43
Rooiels Cr.	Bay Park	122	DC	76
Rooiels Pl.	Forest Village	79	CM	57
Rooiels Rd	Chapman's Peak	100	CW	18
Rooiels Rd	Langa	56	CE	39
Rooiels St	Blommendal	28	BW	51
Rooihout Rd	Langa	56	CE	39
Rooikappie Cl.	Roosendaal	59	CF	52
Rooikat Cl.	Eastridge	91	CR	48
Rooikrans	Lentegeur	90	CO	46
Rooikrans	Simonswyk	47	CB	78
Rooikrans	Thornton	37	CA	36
Rooikrans Ave	New Orleans	142	BB	91
Rooikrans Rd	Firgrove	96	CS	67
Rooikrans Rd	Muizenberg North	103	CV	28
Rooikrans Rd	Pelikan Park	87	CR	33
Rooikrans St	Ruwari	29	BV	58
Rooikrantz St	Kuilsrivier	42	CC	56
Rooipeper	Arbeidslus	48	CA	80
Rooisuikerkan St	Bellville Ext. 53	26	BU	46
Rooivalk Cl.	D'urbanvale	9	BN	48
Roome Cr.	Bishop Lavis	57	CD	43
Roome Rd	Brooklyn	36	BY	31
Roos Rd	Lavender Hill	104	CT	31
Roos Rd	Sea Point	33	BZ	21
Roos St	Anchorage Park	125	DD	77
Roos St	Winslow	125	DD	77
Rooseboom St	Bothasig	14	BS	37
Roosendaal Rd	Roosendaal	58	CF	50
Roosendaal Rd	Roosendaal	59	CE	51
Roosevelt Rd	Claremont	54	CH	31
Roosevelt St	Dal Josafat Industrial Township	142	BD	89
Roosmaryn La.	Protea Park	151	AJ	32
Roosmaryn Rd	Durbanville	18	BQ	53
Roostou Cr.	Roosendaal	59	CF	51
Roosvygie Cl.	Kuilsrivier	42	BZ	55
Roozenboom	De Bron	17	BS	48
Rorine St	Jamestown	64	CH	74
Rorke Rd	Plumstead	86	CO	29
Rosa Hope Cr.	Woodlands	76	CN	45
Rosaki St	Paarlzicht	142	BC	91
Rosalind St	Valhalla Park	56	CE	41
Rosalyn Rd	Chapman's Peak	100	CX	18
Rosalyn Rd	Springbok Park	28	BV	54
Rosamond St	Diepwater (Wesbank)	59	CF	52
Rosanna Cr.	Scottsdene	30	BV	60
Rosary St	Mountain View	142	BB	91
Rosary St	Paarlzicht	142	BC	91
Roscommon Rd	Elfindale	86	CQ	29
Roscommon Rd	Heathfield	86	CQ	28
Roscommon St	Claremont	53	CH	28
Rose	Dunoon	14	BO	37
Rose	Lentegeur	90	CO	45
Rose Ave	Kirstenhof	103	CT	27
Rose Cl.	Bridgetown	55	CG	37
Rose Cl.	Kommetjie	116	DC	11
Rose Cr.	Belhar	58	CD	47
Rose Cr.	Goedemoed	10	BN	53
Rose Innes	Table View	13	BO	31
Rose Innes St	Langa	55	CD	36
Rose La.	Wynberg	72	CL	28
Rose Mount Ave	Oranjezicht	33	CC	22
Rose Rd	Bergvliet	86	CQ	27
Rose Rd	Bishop Lavis	56	CF	42
Rose Rd	Goodwood Estate	37	BY	38
Rose Rd	Ravensmead	39	CA	46
Rose Rd	Uitsig	39	CB	44
Rose St	Bishopscourt	71	CJ	26
Rose St	Central	33	CA	22
Rose St	Hillcrest Heights	79	CL	57
Rose St	Kewtown	55	CF	35
Rose St	Khayelitsha	77	CM	49
Rose St	Kuilsrivier	41	CC	52
Rose St	Lavender Hill East	104	CV	32
Rose St	Morgenster Hoogte	29	BU	56
Rose St	Mowbray	53	CE	29
Rose St	Newlands	71	CJ	25
Rose St	Ocean View	117	DC	15
Rose St	Paarl	145	BE	88
Rose St	Somerset West	114	CV	73
Rose St	Wellington	135	AR	94
Rose Way	Constantia	85	CP	25
Rose Way	Macassar	95	CS	63
Rose Way	Matroosfontein	38	CC	41
Rose Way	Pinelands	36	CC	33
Rosebank Pl.	Oranjezicht	33	CC	22
Roseberry Ave	Oranjezicht	51	CD	22
Roseberry Cl.	Sonstraal Heights	18	BQ	54
Roseberry Rd	Mowbray	54	CD	31
Rosedene Rd	Sea Point	33	CA	20
Rosedon Rd	Lansdowne	54	CH	32
Rosedon Rd	Lansdowne	73	CJ	32
Rose-Innes	William Lloyd	142	BD	92
Roseland Rd	Rondebosch	54	CF	31
Rosemary	Eerstrivier	80	CN	61
Rosemary	Lentegeur	90	CO	46
Rosemary Rd	Belhar	39	CC	46
Rosenburg	Highbury	59	CE	54
Rosendal St	Bothasig	24	BT	38
Rosendal St	Paarl	145	BF	88
Rosendale Rd	Rondebosch	53	CF	29
Rosenow St	Kuilsrivier	42	CA	55
Rosenow St	Somerset West	114	CU	74
Rosequartz St	Sheraton Park	103	CU	29
Roseville Rd	Claremont	72	CJ	29
Rosewood Dr.	Weltevreden Valley	90	CO	43
Rosewood Rd	Hanover Park	74	CK	36
Rosewood St	Langa	56	CE	40
Roslin Cl.	West Beach	4	BN	30
Roslyn La.	Bakoven	50	CF	18
Roslyn Rd	Rondebosch	53	CF	29
Rosmead Ave	Claremont	72	CJ	30
Rosmead Ave	Gardens	33	CC	21
Rosmead Ave	Kenilworth Park	72	CK	30
Rosmead Ave Service Rd	Claremont	72	CJ	30
Rosmead Ave Service Rd	Kenilworth	72	CJ	30
Rosmead Rd	Kalkbaai	120	CZ	27
Ross La.	Fish Hoek	119	DB	23
Ross Rd	Rondebosch	53	CG	29
Ross Rd	Salt River	35	CC	28
Ross Rd	Wynberg	72	CM	30
Ross Sea	Rocklands	90	CS	45
Ross St	Bothasig	24	BT	37
Ross St	Kuilsrivier	41	CA	52
Ross St	Maitland	36	CA	32
Ross St	Valhalla Park	56	CE	41
Rossal Rd	Athlone	54	CG	34
Rossignol St	Chantecler	28	BT	52
Rossine St	Belhar	58	CD	49
Rossini	Delft South	77	CJ	48
Rossini Ct	Delft South	77	CJ	48
Rossini St	Steenberg	103	CT	29
Rossiter St	Wellington	134	AR	92
Rossouw	Wellington	139	AV	93
Rossouw La.	Tokai	85	CS	26
Rotherfield Rd	Plumstead	72	CN	30
Rotherfield Rd	Plumstead	86	CO	30
Rothesay Pl.	Greenpoint	33	BY	21
Rothesay Rd	West Beach	4	BN	30
Rothschild Blvd.	Panorama	25	BV	41
Rotsho St	Victoria Merge	78	CN	51
Rotspunt Cl.	Melkboschstrand	3	BD	25
Rotterdam Cr.	Uitsig	19	BO	56
Rotterdam Rd	High Gate	59	CG	54
Rotterdam Rd	Strandfontein	107	CT	43
Rotterdam St	Avondale	150	AH	31
Rotterdam St	Monte Vista	25	BU	40
Rottingdean Rd	Bakoven	50	CF	18
Rouen Ave	Plumstead	86	CO	29

Activity 2 — Getting to the meeting on time

Activity 2 continues with the theme of assisting with travel arrangements, but in this activity learners' skills are extended to include thinking about travelling time to and from the airport as well as reading flight timetables

ABOUT THIS ACTIVITY

In this activity learners will again be reading maps. The will draw on the skills that they have learned in activity 1. They are asked to use maps to work out travel distances. Then they are asked to think about how long the journey will take. Here they have to consider maximum allowed speeds and how traffic on the roads affects travelling time.
They are also asked to read flight timetables and to plan flights by taking into account travelling time to and from the airport.

This activity prepares learners to meet the following outcomes of Unit Standard 14108:
SO 1: Measure, estimate and calculate physical quantities in practical situations:
o AC 2, 5, 6
SO 2: Explore, describe and represent, interpret and justify geometrical relationships:
o AC 2, 3, 4, 5, 6, 7

MANAGING THIS ACTIVITY

Learners should be given worksheet 2 and a copy of handout 1 (from activity 1).

2.1 They should take the N2 (some learners may call this Settlers Way).

Note the V& A Waterfront is not actually marked on the map, so you may need to have a discussion about where it is. Alternatively, also give learners the handouts with the map of the Waterfront and with the detail of Eastern Boulevard and De Waal Drive. This may also help learners to answer question 2.2 below(although it is important to stress that they only need approximate distances for this task).

2.2 The length of the road on the map is about 3,5 cm, so the total distance in reality is about 18 km. This is without counting the airport approach road (which is about 2km) or any road within the Waterfront.

2.3 Learners can place a piece of string over the road and then measure the length of string on a ruler. The legend shows that 1 cm = 5 km.

Some learners may do the calculation using the ratio on the legend:

3,5 cm × 500 000 = 1800 000 cm = 18 000 000 mm = 18 km

2.4 Learners need to calculate time when they are given the speed limits.

Here we show one way to calculate the time taken. Learners may have other ways of doing the calculation. Speed = distance divided by time taken. So time taken = distance travelled divided by speed travelled.

2.4.1 If you travel 100 km at 100 km/h it will take 1 hour.

So 6 km at 100 km/ h will take $\frac{6}{100}$ or 0,06 of an hour or 3, 6 minutes (we can say about 4 minutes).

If you travel 80 km at 80 km/h it will take 1 hour.

So 8 km at 80 km/h will take $\frac{8}{80} = \frac{1}{10}$ of an hour or 6 minutes.

If you travel 60 km at 60 km/h it will take 1 hour.

So 4 km at 60 km/h will take $\frac{4}{60}$ of an hour = 0,07 of an hour or 4 minutes

In total it will take you about 14 minutes.

However, this is if you are moving the whole time. There are several sets of traffic lights along the way. One also needs to consider the time it takes to travel along the roads in the Waterfront and the Airport Approach Road itself, as well as getting out of the parking at the airport and finding parking at the Waterfront.

Learners should allow at least 30 minutes – when there is no traffic.

2.4.2 It does not always take the same time to travel this route.

2.4.3 The amount of traffic affects the speed at which you can travel. One can predict that at peak travel times (in the morning and evening) the traffic moves much more slowly. Learners can expect that it will take at least 70 minutes to drive between the airport and the Waterfront in peak traffic.

Travel time can also be affected by weather, road maintenance, accidents and large functions like the opening of parliament or important sports events. Office administrators need to consider the likelihood of any such events and their impact on travel time.

2.5 Learners can find what the codes mean by looking beneath the table on the handout.

2.5.1 DLY means daily – these flights fly every day.

2.5.2 X means except – these flights will fly on all days other than those preceded by an X.

2.5.3 1 means Monday – these flights fly on Mondays.

2.5.4 5 means Friday – these flights fly on Fridays.

2.5.5 6 means Saturday – these flights fly on Saturdays.

2.5.6 7 means Sundays – these flights fly on Sundays.

2.6 The answer to 2.6.1 and 2.6.2 are in the table below.

Flight number	Depart	Arrive
SA 1372	08:10	09:45
SA 1412/ SA 323	06:45	12:10
SA 462/ SA 327	08:00	13:10

2.6.3 The best flight to book her on would be the direct flight SA 1372. The main reason for this is that she will spend much less time travelling. This will have the following advantages:

- She will probably be more attentive at the meeting.
- It will allow a greater range of times in which the meeting could take place. Learners will find in the questions below that once both the travel time to and from the airport and times of the return flights have been considered, there is little time left for the meeting.

2.6.4 You should allow at least 30 minutes.

2.6.5 Flight lands at 09:45.

Time to check out and get the car: minimum 30 minutes: 10:15

Time to travel to Waterfront, find parking, get to office etc. minimum 30 minutes: 10:45

Allow an extra 15 minutes, just in case anything takes a bit longer. Expected time to arrive at office is no earlier than 11:00

2.6.6 11:00 + 2 hours = 13:00

2.7.1 Flight SA 1375 will land at 18:30. She will still need to collect her luggage and drive home.

2.7.2 17:00

2.7.3 She is expected to check in 90 minutes before 17:00. This is at 15:30.

The flight check-in closes 30 minutes before 17:00: this is 16:30. She will probably be fine if she checks in at 16:00 or 60 minutes before the flight.

2.7.4 Learners calculated that the minimum travelling time between the airport and the Waterfront was 30 minutes.

2.7.5 The very latest she could leave your office would be 16:00 minus 30 minutes i.e. 15:30, but she still needs to get from your office to the car and from the parking place to the end of the Waterfront. You should probably allow 45 minutes, which would mean that she should leave no later than 15:15.

2.7.6 The only flight you could book her back on would be SA 1375.

2.8 Here learners need to think about arrival times, times to travel to and from the airport plus the length of the meeting.

In questions 2.6 and 2.7 above learners calculated this time as follows: 30 minutes to check out and hire car + 30 minutes to get to Waterfront + 15 minutes to get to office + 2 hours of meeting time + 15 minutes to get from office to end of Waterfront + 30 minutes to get to airport + 1 hour check-in time. This is a total of 5 hours.

2.8.1 SA 1378 – only flies on Saturdays.

2.8.2 SA 1362 – lands 13:15. If you add 5 hours, this would take you to 18:05. She would miss the flight home.

2.8.3 SA1374– lands 16:30. Even without leaving the airport she would miss the check-in flight for the return flight.

2.8.4 SA 1376; SA 462 / SA 372; SA 464 / SA 333; SA 1406 / SA 343; SA 467 / SA 347; SA 1406 / SA 359

2.9.1 Because of the peak hour traffic, this journey would probably take longer, say about 75 minutes.

2.9.2 To get an 18:30 flight you need to be at the airport at 17:30. If you estimate that it will take 75 minutes to cover that distance, you would need to leave the Waterfront at 16:15. So you would need to leave your office at 16:00.

Discuss with learners the importance of considering peak travel periods in big cities. If you leave Waterfront at 15:15 you can catch a 17:00 flight

But you need to leave 45 minutes later to catch a flight that leave 90 minutes later at 18:30.

Activity 2 — Getting to the meeting on time

You need to book a flight for Dr Ngobo from East London. She needs to be at a 2 hour meeting at your office in the Waterfront next Thursday. You need to look up the flight details and plan which flight to book her on.

2.1 What road do you take from the airport to the Waterfront?

2.2 How far is it from the airport to the Waterfront?

2.3 Explain how you used the map to work out the distance.

2.4 There are different speed limits along the way. You can travel
- o 100 km per hour for about 6 km
- o 80 km per hour for about 8 km
- o 60 km an hour for about 4 km

2.4.1 How long will it take you to get from the airport to the Waterfront?

2.4.2 Does it always take the same amount of time to travel into town from the airport?

2.4.3 What things can change the amount of time it takes you to make a journey?

2.5 Now look at the flight times on the handout. What do the following codes mean:

2.5.1 DLY

2.5.2 X

2.5.3 1

2.5.4 5

2.5.5 6

2.5.6 7

2.6 Answer the following using the information on the handout.

2.6.1 What are the three earliest flights that Dr Ngobo could take from East London? Write down the flight numbers.

2.6.2 At what times do these flights get to Cape Town?

2.6.3 On which of these three flights would it be best to book Dr Ngobo? Give reasons for your answer.

2.6.4 About how much time should you allow for Dr Ngobo to get her luggage and organise the hired car?

2.6.5 At about what time do you think she could arrive at your office?

2.6.6 If the meeting starts as soon as she arrives, what time would it end?

2.7 Answer the following questions if Dr Ngobo takes flight SA 1375 back to East London.

2.7.1 What time will she arrive home?

2.7.2 What time does this flight leave Cape Town Airport?

2.7.3 How long before the flight should Dr Ngobo be at the airport? What time must she be at the airport?

2.7.4 How long would it take to get back to the airport?

2.7.5 What time should she leave your office at the Waterfront?

2.7.6 On which other flights could you book Dr Ngobo back home and be sure to be able to conclude the meeting?

2.8 Now let's think again about the morning flights. Why can't Dr Ngobo catch the following flights:

2.8.1 SA 1378?

2.8.2 SA 1362?

2.8.3 SA 1374?

2.8.4 Give a list of other flights which she can't catch to be at a meeting during the day on a Thursday.

2.9 Now let's see what happens if you have to travel during the peak travel period.

2.9.1 About how long do you think that it takes to get from the Waterfront to the airport if you leave at 17:00? Explain your calculations.

2.9.2 What time would be the latest that you could leave your office to get an 18:30 flight?

Flight times from East London to Cape Town.

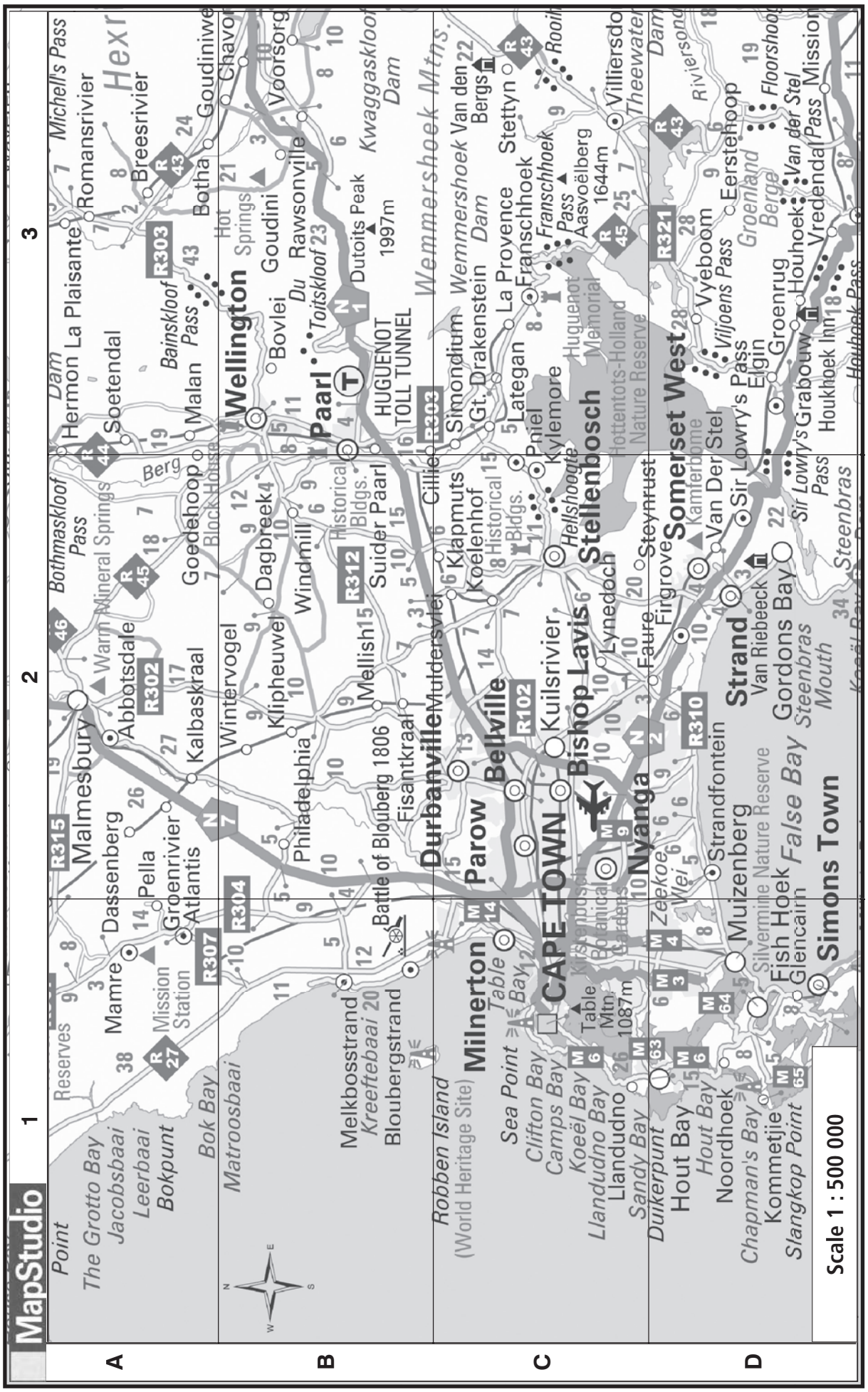
Frequency	Depart	Arrive	Flight number	Stop/via
X 67	0810	0945	SA 1372	Nonstop
6	0930	1105	SA 1378	Nonstop
7	1140	1315	SA 1362	Nonstop
X6	1455	1630	SA 1374	Nonstop
DLY	1900	2035	SA 1376	Nonstop
X67	0645	1210	SA 1412/ SA 323	Jnb
X67	0800	1310	SA 462/ SA 327	Jnb
7	0905	1410	SA 464/ SA 333	Jnb
X7	1040	1610	SA 1406/ SA 343	Jnb
DLY	1235	1710	SA 476/ SA 347	Jnb
X5	1450	1940	SA 1406/ SA 359	Jnb

Flight times from Cape Town to East London.

Frequency	Depart	Arrive	Flight number	Stop/via
X 67	0600	0730	SA1371	Nonstop
6	0730	0900	SA 1377	Nonstop
7	0940	1110	SA 1361	Nonstop
X 6	1255	1425	SA 1373	Nonstop
DLY	1700	1830	SA 1375	Nonstop
X 6	0730	1205	SA 308/ SA 417	Jnb
DLY	0840	1400	SA 316/ SA 1407	Jnb
X 67	0905	1400	SA 1524/ SA 1407	Jnb
DLY	1140	1615	SA 323 / SA 475	Jnb

X – Except DLY daily 1- Mon 2 - Tues 3-Wed 4- Thurs 5- Fri 6-Sat 7-Sun

Check in times:
Domestic passengers are requested to check in 90 minutes before departure. Domestic check-in closes 30 minutes before departure.


MapStudio
Scale 1 : 500 000
CAPE TOWN
Bellville
Parow
Milnerton
Durbanville
Bishop Lavis
Stellenbosch
Somerset West
Strand
Nyanga
Wellington
Paarl
Malmesbury
Simons Town
False Bay
Table Bay
Table Mtn. 1087m
Dutoits Peak 1997m
HUGUENOT TOLL TUNNEL
Wemmershoek Mtns.
Kwaggaskloof Dam
Wemmershoek Dam
Theewaterskloof Dam
Hottentots-Holland Nature Reserve
Silvermine Nature Reserve
Robben Island (World Heritage Site)
Kirstenbosch Botanical Gardens
Battle of Blouberg 1806
Aasvoëlberg 1644m
Hermon
Romansrivier
Breesrivier
Botha
Goudiniwe
Chavon
Voorsorg
Rawsonville
Goudini
Bovlei
Hermon
La Plaisante
Soetendal
Bainskloof Pass
Malan Pass
Goedehoop
Bothmaskloof Pass
Warm Mineral Springs
Abbotsdale
Kalbaskraal
Wintervogel
Klipheuwel
Dagbreek
Windmill
Philadelphia
Mellish
Suider Paarl
Fisantkraal
Muldersvlei
Klapmuts
Koelenhof
Simondium
Gt. Drakenstein
La Provence
Franschhoek
Stettyn
Lategan
Pniel
Kylemore
Hellshoogte
Huguenot Memorial
Van den Bergs
Villiersdorp
Kuilsrivier
Lynedoch
Faure
Firgrove
Steynrust
Van Der Stel
Kamferboom
Vyeboom
Eerstehoop
Viljoens Pass
Elgin
Groenrug
Houhoek
Vredenda
Van der Stel Pass
Mission
Houhoek Inn
Sir Lowry's Pass
Grabouw
Gordons Bay
Van Riebeeck
Strandfontein
Muizenberg
Fish Hoek
Glencairn
Kommetjie
Slangkop Point
Chapman's Bay
Noordhoek
Hout Bay
Duikerpunt
Sandy Bay
Llandudno
Koeël Bay
Clifton Bay
Camps Bay
Sea Point
Melkbosstrand
Kreeftebaai
Bloubergstrand
Malmesbury
Dassenberg
Pella
Groenrivier
Atlantis
Mamre
Mission Station
Reserves
Bok Bay
Matroosbaai
Leerbaai
Bokpunt
Jacobsbaai
The Grotto Bay
Point
Michell's Pass
Hexr
Berg
Hot Springs
Block House
Toitskloof
Du
Gt.
Pass
Hellshoogte
Steenbras Mouth
Steenbras Pass
Groenland Berge
Floorshoogte
Van der Stel
Sir Lowry's Pass
Houhoek Pass
Zeekoe Vlei
Silvermine
Kirstenbosch
Rooiels
Franschhoek Pass
Aasvoëlberg
Hot Springs
Block House
Berg
Bainskloof Pass
Malan Pass
Bok Bay
Matroosbaai
Leerbaai
Bokpunt
Jacobsbaai
The Grotto Bay
Point
Reserves
Mamre
Mission Station
Dassenberg
Pella
Groenrivier
Atlantis
Malmesbury
Abbotsdale
Kalbaskraal
Wintervogel
Klipheuwel
Philadelphia
Dagbreek
Windmill
Mellish
Suider Paarl
Fisantkraal
Battle of Blouberg 1806
Melkbosstrand
Kreeftebaai
Bloubergstrand
Robben Island
(World Heritage Site)
Milnerton
Sea Point
Clifton Bay
Camps Bay
Koeël Bay
Llandudno Bay
Llandudno
Sandy Bay
Duikerpunt
Hout Bay
Hout Bay
Noordhoek
Chapman's Bay
Kommetjie
Slangkop Point
Fish Hoek
Glencairn
False Bay
Simons Town
Table Bay
Table Mtn. 1087m
Muldersvlei
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Koelenhof
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Gt. Drakenstein
La Provence
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Stettyn
Lategan
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Kylemore
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Huguenot Memorial
Van den Bergs
Villiersdorp
Kuilsrivier
Lynedoch
Faure
Firgrove
Steynrust
Van Der Stel
Kamferboom
Vyeboom
Eerstehoop
Viljoens Pass
Elgin
Groenrug
Houhoek
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Gordons Bay
Van Riebeeck
Strandfontein
Muizenberg
Silvermine Nature Reserve
Steenbras Mouth
Steenbras Pass
Groenland Berge
Floorshoogte
Zeekoe Vlei

Activity 3 — Decorating the new kitchen

This activity and the one that follow both look at area and perimeter measurements within the context of decorating a new office kitchen. Learners are asked to think about how this context impacts on a range of mathematical knowledge and skills.

ABOUT THIS ACTIVITY

In this activity learners calculate areas of rectangular surfaces in the context of tiling walls and floors.
They consider rounding off within this context and find out that sometimes it does not pay to round off too early in a calculation. They also see that in some contexts they need to round up, despite the mathematical rule about rounding down when the number is below 5.

This activity prepares learners to meet the following outcomes of Unit Standard 14108:
SO 1: Measure, estimate and calculate physical quantities in practical situations:
- AC 2, 4, 5, 6

SO 2: Explore, describe and represent, interpret and justify geometrical relationships:
- AC 1, 2, 3, 4, 5, 6, 7

MANAGING THIS ACTIVITY

Start by checking that learners know how to calculate the area of a rectangular surface and that they understand why we use length multiplied by breadth to get area. If learners are not clear about this then you can use the concept of tiling to lay the conceptual basis.

One can think of simple small tiles (like on the bottom of some swimming pools) that are 1 cm wide and 1 cm high. Learners can use graph paper and colour in the rows of squares mentioned below.
- 1 row of 10 of these will give an area or 10×1 cm² = 10 cm².
- 2 rows of 10 of these will give an area or $2 \times 10 \times 1$ cm² = 20 cm².
- 3 rows of 10 of these will give an area or $3 \times 10 \times 1$ cm² = 30 cm².
- 4 row of 10 of these will give an area or $4 \times 10 \times 1$ cm² = 40 cm².
- 5 rows of 10 of these will give an area or 5 x10×1 cm² = 50 cm² etc.

Learners should be given worksheet 3 and a copy of handout 3.

In many of these questions learners are asked to estimate their answers before they do the calculations. This will help them to see whether they make any errors. They should also always think about whether they have overestimated or underestimated when they round off the numbers.

3.1 The wall area to be tiled is 0,8 m × 2,6 m = 2,08 m².

3.2 One box of small wall tiles will tile an area of 2 m². They will need 2 boxes. No matter how much over 2 m² they need, they will need another box of tiles. The activity worksheet gives the reasons why they need to buy more tiles than they need to cover the area.

3.3 Two boxes of tiles will give you 4m² of tiles.

3.4 Estimation: 2 × R90 = R180. The 2 boxes of tiles will cost just under R180.
Calculation: Two boxes of small white wall tiles will cost 2 × R88,95 = R177,90.

3.5 One box of large wall tiles will tile an area of 1,5 m². So you will need 2 boxes of these tiles.

3.6 Two boxes of large tiles will tile an area of 3 m².

3.7 Estimation: 2 × R120 = R240. The two boxes of big tiles will cost just under R240,00
Calculation: Two boxes of the large wall tiles will cost 2 × R119,95 = R239,90.

3.8 The floor area to be tiled is:
The "kitchen" area : 2,8 metres × 3,6 metres = 10,08 m².
The "dining" area: 4,5 metres × 3,2 metres = 14,4 m².
The total floor area is 24,48 m².

3.9 Number of boxes of linoleum tiles needed: 24,48 ÷ 0,81 = 30,2222222. You can't buy parts of boxes of tiles. So this means that you will need 31 boxes of tiles.

3.10 31 boxes will be able to tile an area of 31 × 0,81 m^2 = 25,11 m^2 of tiles.

3.11 Estimation: 31 × R20 = R620. The actual cost will be a bit less than R620.

Calculation: 31 boxes of linoleum tiles will cost: 31 × R19,95 = R618,45.

3.12 Number of boxes of ceramic tiles needed 24,48 ÷ 1,75 = 13,98. This means that you will need at least14 boxes of tiles.

3.13 14 boxes of tiles will tile an area of 24,5 m^2 .

3.14 24,5 m^2 of tiles will only allow 0,02 $m^2$of extra tiles. This is less than 1 tile extra, and so it is unlikely that you will be able to cut tiles to fill the small spaces and there will be nothing over for breakage. This means that you should probably buy15 boxes of tiles. 15 boxes of tiles will tile an area of 26,35 m^2.

Discuss with learners that the answers to all calculations must be considered in context. This lies at the heart of Mathematical Literacy.

3.15 Estimation: 15 × R150 = R2 250. The cost of 15 boxes of the tiles will be a bit less than R2 250.

Calculation: Cost of 15 boxes = 15 × R149,95 = R 2 249,25

3.16 Estimation of the floor area to be tiled is:

Estimation of the "kitchen" area : 3 metres × 4 metres = 12 m^2.

Estimation of the "dining" area: 5 metres × 3 metres = 15 m^2.

Estimation of The total floor area is 27 m^2.

Discuss with learners that this estimation is more than 2,5 m^2 greater than the calculation and alert them to the fact that this will lead to an increase in the number of boxes of tiles they would purchase and so increase their costs.

3.17 Floor tiles needed based on the estimation above:

3.17.1 Linoleum floor tiles 34 boxes of tiles.

3.17.2 Ceramic floor tiles 16 boxes of tiles.

3.18 Costs of floor tiles needed based on the estimation above.

3.18.1 Linoleum floor tiles R678,30.

3.18.2 Ceramic floor tiles R2 399,20.

Let learners compare the amounts of money based on the real and estimated area calculations. Let them see how much extra they would have spent if they had rounded off the area of the floor. Talk about how sometimes it is not a good idea to round off numbers at the start of a calculation.

3.19

Type of wall tile	Cost per box of tiles	Number of boxes needed	Total cost
Plain / standard white	R88,95	2	R177,90
Large white	R119,95	2	R239,90

Type of floor tile	Cost per box of tiles	Number of boxes needed	Total cost
Linoleum tile	R19,95	31	R618,45
Ceramic tile	R145,95	15	R2 249,25

Activity 3 — Decorating the new kitchen

Your company is moving to new offices. One room has been set aside for an open-plan kitchen and dining area. Your manager has asked you to cost various options for decorating it. The first task is to find out about tiling the floors and walls.

Here is what you need to tile:
Walls:

- The length of wall to be tiled is 2,6 metres. The area above the counters and the sink needs to be tiled to a height 0,8 metres above these surfaces.

Floors. There are two sections of floor to be tiled.

- The "kitchen" area is 2,8 metres wide and 3,6 metres long.
- The "dining area" is 4,5 metres long and 3,2 metres wide.

In handout 3 are quotes of the costs of different kinds of tiles. Tiles are sold in boxes of set amounts. Different types of tiles are sold in boxes that contain different amounts of tiles. Each kind of tile will say on the box how many square metres of tiles the box contains.

You need to work out how much the different options cost. First you need to work out how many boxes of tiles you need for each kind of tile. To calculate how many boxes of tiles you need you must work out the area to be tiled.

3.1 What is the wall area to be tiled?

3.2 How many boxes of the small tiles will this take?
Remember that you will need extra tiles for the following reasons:

- You need extra tiles for cutting and fitting into the places that are too small to take a whole tile.
- Some tiles may break during the cutting and laying process.
- You may need tiles over in case some tiles are damaged in later years.

3.3 What area can be tiled by the number of boxes of small tiles that you need to buy?

3.4 How much will these small tiles cost? Estimate first, then calculate.

3.5 How many boxes of the big tiles do you need?

3.6 What area can be tiled by the number of boxes of large tiles that you need to buy?

3.7 How much will these tiles cost? Estimate first, then calculate.

3.8 What is the floor area to be tiled?

3.9 How many boxes of the linoleum tiles will this take?

3.10 What area can be tiled by the number of boxes of linoleum tiles that you need to buy?

3.11 How much will these tiles cost? Estimate first, then calculate.

3.12 How many boxes of the ceramic tiles do you need?

3.13 What area can be tiled by the number of boxes of ceramic tiles that you need to buy?

3.14 Will your answer to question 3.13 above be enough to give you extra tiles for breakages and cutting to fit the space. See whether you need to adjust your answer.

3.15 How much will these tiles cost? Estimate first, then calculate.

3.16 If you had started by rounding off the length and breadth of the floor, what area would you have based your calculations on?

3.17 How would this estimated area have changed the number of boxes that you would have purchased of:

3.17.1 Linoleum tiles?

3.17.2 Ceramic tiles?

3.18 Now calculate what your cost would have been for:

3.18.1 Linoleum tiles.

3.18.2 Ceramic tiles.

3.19 Draw up a table for your manager in which you summarises the following information:

- Number of boxes of each type of tile needed.
- Cost per box of tiles.
- Total cost of buying each type of tile.

Wall tiles

Plain white kitchen/bathroom tiles 150 mm × 150 mm.
Boxes of tiles can cover an area of 2m^2.
Cost R88.95 for a box.

Large white kitchen tiles 195 mm × 245 mm.
Boxes of tiles can cover an area of 1,5 m^2.
Cost for a box R119,95.

Floor tiles

Linoleum tiles 225 mm × 225 mm.
Boxes of tiles cover an area of 0,81 m^2.
Cost per box R19,95 per pack.

Ceramic tiles 295 mm × 295 mm.
Boxes of tiles can cover an area of 1,75 m^2.
Cost R 149,95 for a box.

Activity 4 — Making table cloths and curtains for the new kitchen

Learners continue the exploration of areas, that was started in activity 3, and how context impacts on the way one estimates and calculates.

ABOUT THIS ACTIVITY

In this activity learners work with the area of circles. They also work again with calculating areas of rectangles, but in these examples they see that sometimes it is not necessary to work with the area formulae – in many practical situations we can simply work with either the length or the breadth only when working out the covering of a surface. This is because often either the width or length of what we are working with is already set.
Learners also need to think about the units in which they measurements are given and convert measurements into the same units before doing calculations.

This activity prepares learners to meet the following outcomes of Unit Standard 14108:
SO 1: Measure, estimate and calculate physical quantities in practical situations:
o AC 1, 2, 3, 4, 5, 6
SO 2: Explore, describe and represent, interpret and justify geometrical relationships:
o AC 1, 2, 3, 4, 5, 6, 7

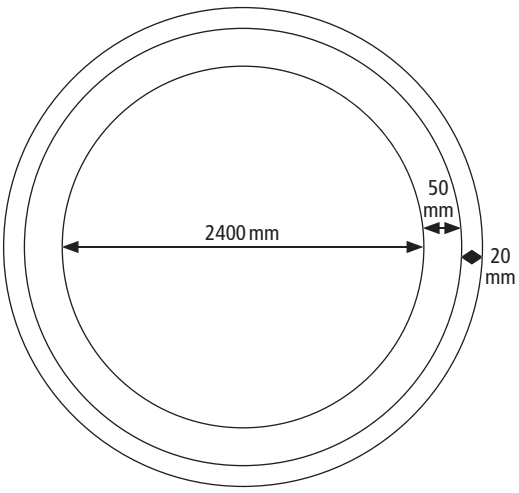
MANAGING THIS ACTIVITY

First check that learners are familiar with the parts of a circle. For example they will need to know that the diameter of the circle is twice the radius. Find out if they know what the formulae are for the circumference of a circle and the area of a circle. If they do not they can simply use the handout to find the formulae. Learners should be given worksheet 4 and a copy of handout 4.

4.1 The area of the table top is πr^2. The diameter of the table is 1 200 mm. So the radius is 600 mm.
Therefore $\pi r^2 = \frac{22}{7} \times 600 \text{ mm} \times 600 \text{ mm} = 1131428{,}6 \text{ mm}^2$. The answer is in square millimetres.
This will be equal to 1,1314286 m^2 which is equal to about 1,1 m^2.

4.2 If you want a hem of 2 cm all round and a drop of 5 cm all round, then we can calculate the area of the circular piece of material as follows:
Radius: First convert all the measurements to millimetres:
600 mm + 50 mm + 20 mm = 670 mm
Area = $\pi r^2 = \ \times 670 \text{ mm} \times \ 670\text{mm} = 1410828{,}6 \text{ mm}^2 \approx 1{,}4 \text{ m}^2$.

4.3 The radius of the circle of material you need is 670 mm, so the diameter is 1340 mm = 1,34 m. This can easily be cut from a bolt of cloth that is 1,5 metres wide. You will not need to join sections to make the table cloths.
Learners may calculate the answers in different ways e.g. some learners may start from the diameter again and calculate as follows:
2 cm + 5 cm + 1200 mm + 5 cm + 2 cm = 20 mm + 50 mm + 1200 mm + 20 mm + 50 mm = 1340 mm.



4.4 Estimation: We know that the diameter of the circle will fit into 1,5 m. So we need a length of a bit less than 5 × 1,5 m = 7,5 m.

Calculation: 1340 mm × 5 = 6700 mm = 6,7 m. But most shops will only sell lengths of metres or half metres, so you will need to buy 7 metres of the cloth.

4.5 The easiest way to draw the circle is to take a piece of string the longer than the radius required (670 mm). They can tie a knot at one end and attach this to the material with a safety pin. They can then measure the radius of the circle and tie some dressmakers' chalk to the string at that distance from the knot. If they pull the string taut they will be able to move it round and draw a circle of the required size on the material.

It will be useful for learners to demonstrate this or for you to demonstrate it to them. This is the same principle according to which a pair of compasses work.

4.6 Learners need to use the formula for circumference of a circle to calculate the length of the fringe on each table cloth. They should remember that the fringe will be attached after the hem has been put in, so they should not include the hem allowance in the calculation of the radius. They must, however, include the allowance for the drop.

4.6.1 $2\pi r = 2 \times \frac{22}{7} \times 670 = 4\,211{,}4286\text{mm}.$

The distance round the hem of each table cloth will be 4 211,4286 mm. Since we are talking about sewing it makes sense to leave this in millimetres i.e. 4 211 mm

4.6.2 They should allow a further 2 cm or 20 mm to "finish off" the fringe on each cloth, this will take the amount of fringe per table cloth to 4 213 mm.

4.6.3 For all 5 table cloths they will need (5 × 4 213mm) of fringe. They need 21 065 mm or 21,065 metres of fringing for all 5 table cloths. Since one can only buy fringing in meter or half metres lengths, they will need to buy 21,5 metres of fringing.

4.7 Here learners need to think about the following:

- They need material for the top and bottom hem and side hems. This means that solution (4.7.1) is inappropriate. Also talk about whether they think they will use two curtains that close in the middle or one curtain that is drawn back to one side for each window.
- To make blinds learners only need to consider the extra material needed for the hems, but with curtains you need extra width for the gathering. This means that solutions (4.7.2) and (4.7.3) are inappropriate.
- There are two sets of windows so you need either 2 curtains that draw to one side or two pairs of curtains.
- You need extra length because the curtain rail will be above the window, and curtains normally hang below the window frame.
- Learners should also remember that this material is sold in bolts that are 1,5 metres wide. This will be sufficient for 4 small side hems (4 × 20 mm), the width of the window (1200 mm) and some gathering (220mm). If only one curtain is made per window, there will be more material for gathering. This means that (4.7.4) two 1 metre lengths of material will be sufficient.

Mathematically we talk about the covering of a surface as area. In many practical situations one of the dimensions is also given or set. In the example above the width of the material is fixed. When this happens one only needs to work with the other variable dimension. Learners should be able to see from this that in some practical situations we only need to calculate lengths in order to work out how much we need to cover a surface, and that it is often unnecessary to look up and apply the formula to calculate area.

Activity 4 — Making table cloths and curtains for the new kitchen

You have also been asked to work out the costs of making table cloths for the tables for the dining area in your new offices. There are 5 circular tables for the dining area. Each table has a diameter of 1 200 mm. You can start by working out the area of a table top.

4.1 First find the formula for the area of a circle in the handout. What units is your answer in? Convert the area into m^2.

4.2 You want to have table cloths that hang 5 cm over the edge of each table. Remember that you also need a hem for the cloths. You should allow about 2 cm all around for each hem. What area of material do you need for each cloth?

4.3 The shop across the road is selling lovely bright material that is 1,5 m wide. Is this wide enough to cut the table cloths from without having to join pieces together?

4.4 How many metres of this cloth will you need? Estimate first and then calculate.

4.5 Think of a way that you can draw the circles on the cloth or make a paper pattern to use.

4.6 Now you also want to put a fringe on each cloth.

4.6.1 What length of fringe do you need to go around the cloth?

4.6.2 About how much extra will you need for overlap or sewing off the ends of the fringe?

4.6.3 How much fringing do you need to all 5 table cloths? Give the answer in both millimetres and in metres.

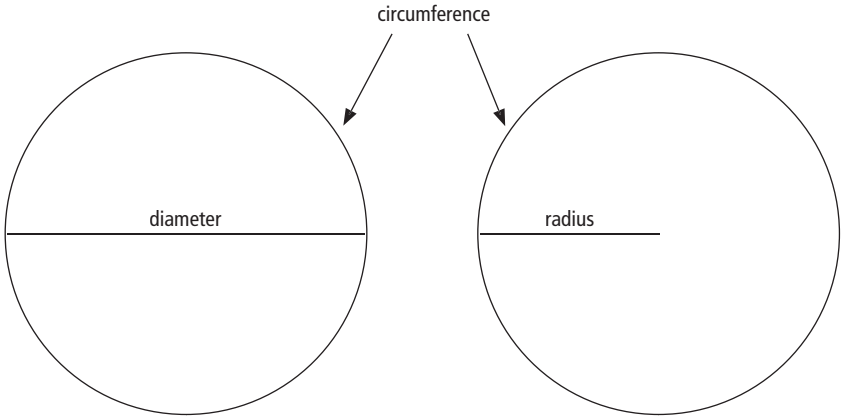
4.7 The kitchen has two sets of windows. The size of the windows is given on page 2 of handout 4. You decide to make some curtains to match the table cloths. Say which of the following amounts of material will be sufficient to make the curtains. Explain your choice of answer.

4.7.1 1200 mm x 880 mm = 960 000 mm^2 = 0,96 m^2.

4.7.2 2 × (1200 mm x 900 mm) = 2 × 1,08 m^2 = 2,16 m^2.

4.7.3 Two 1 metre lengths of material.

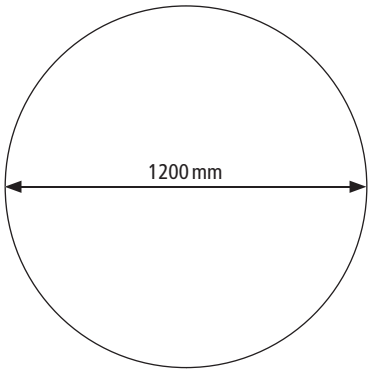
Parts of a circle



Circle formulae

Area of circle	πr^2
Circumference of circle	$\pi 2r$

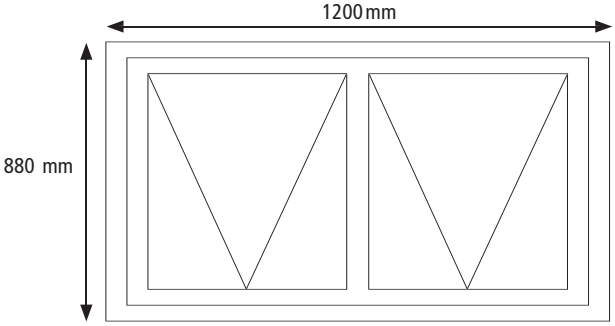
Size of table top — viewed from above



Converting between metric units

1 m = 10 dm	1 dm = 0,1 m	1 dm × 1 dm = 0,1m × 0,1 m = 0,01 m^2
1 m = 100 cm	1 cm = 0,01 m	1 cm × 1 cm = 0,01m × 0,01 m = 0,0001 m^2
1 m = 1 000 mm	1 mm = 0,001 m	1 mm × 1 mm = 0,001m × 0,001 m = 0,000001 m^2

Dimensions of kitchen window



Activity 5 — Buying an urn

This is the third activity about setting up a new office kitchen. The only information that learners need from activity 4 is how to calculate the area of a circle. They will use this to find the volume of water that an urn can hold.

ABOUT THIS ACTIVITY

In this activity learners work with finding the volume of cylinders. The context revolves around the maximum and minimum amounts of water an urn can hold.

Learners may well be more familiar with electric kettles than with urns. If they have never or seldom seen an urn, then it may be useful to make a cardboard cylinder as a prop. However, it will be useful to help them to think about cylindrical electrical kettles to help them better visualise the shape they are working with and its constraints. Learners are asked to draw an urn from different positions to help them to see what limits the minimum amount of water that an urn can hold. Drawing a picture from different perspectives can help one to solve problems with shape and space.

They are also required to convert between different units of measurement and to think sensibly about how accurate their measurements need to be in this context.

This activity prepares learners to meet the following outcomes of Unit Standard 14108:
SO 1: Measure, estimate and calculate physical quantities in practical situations:
- o AC 2, 5.

SO 2: Explore, describe and represent, interpret and justify geometrical relationships:
- o AC 1, 2, 3, 4, 5, 6, 7.

MANAGING THIS ACTIVITY

Learners should be given worksheet 5 and a copy of page 1 of handout 5.

5.1 82 x 200 ml = 16 400 ml = 16,4 litres.
82 x 250 ml = 20 500 ml = 20, 5 litres.

5.2 Not everyone drinks tea from mugs so a 20 litre urn will be sufficient.

5.3 If the diameter of the urn is 21 cm, then the radius is 10,5 cm.

When they get to the end of this calculation, they will find that their answer is more than 12 litres. Remind them that the container is always bigger than the volume of water that is boiled inside. They can think about the "maximum" marking on a kettle.

$\pi r^2 \times h = \pi \times 10{,}5 \times 07{,}5 \times 35 = \frac{22}{7} \times 10{,}5 \times 10{,}5 \times 35 = 12127{,}5\ cm^3 = 12127{,}5\ ml = 12{,}1275$ litres.

This is about 12 litres.

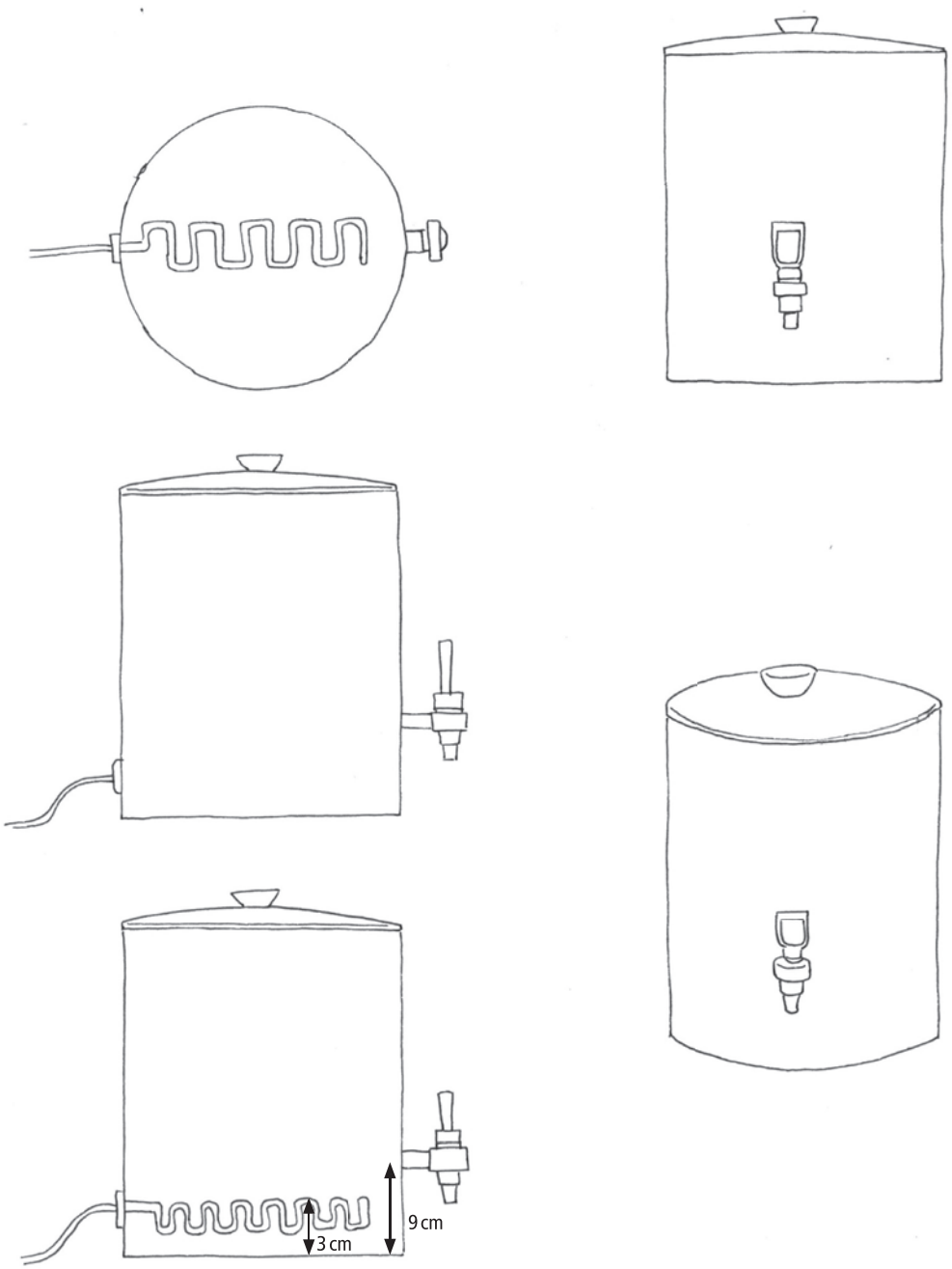
Help learners to see that the measurements are given in centimetres, therefore the final answer will be in cubic centimetres. 1 cm^3 = 1 ml, so they can just rewrite their answers as millilitres and then divide by 1 000 to get the answer in litres.

Learners need to see that if they purchase another 12 litre urn this will be sufficient for staff to all have boiling water at the same time.

5.4 See attached drawings. If learners find this question difficult you can assist them by doing the following:

- o First provide them with pictures of a variety of objects from different views and then ask them to match the same objects from different views.
- o Then give them a picture of an object from an unusual view and ask them to identify the object.
- o Then give them pictures of objects from oblique views and ask them to draw the objects from the top, side and front.

What they are doing in this question is drawing the object from different views in order to help them understand that if the water level is below the level of the tap, then they cannot get the boiled water out of the tap. Also, if the boiled water is below the element then the element could overheat and burn out. They need to work out if the top of the element is higher or lower than the bottom of the tap.



5.5 They need:

- The height (and the diameter of the tap opening) i.e. the distance from the base of the urn to the bottom of the tap opening.
- The distance from the base of the urn to the top of the element.

The top of the element is 3 cm from the base of the cylinder. The bottom of the tap is 9 cm from the base of the urn. So one has to fill the urn to a height of at least 9 cm.

$\pi r^2 \times h = \pi \times 10{,}5 \times 07{,}5 \times 9 = \frac{22}{7} \times 10{,}5 \times 10{,}5 \times 9 = 3118{,}5\ cm^3. = 3116{,}5\ ml = 3.1185$ litres.

This is about 3,2 litres.

Many kettles boil 2 litres when full. The minimum amount of water one could boil in the urn would realistically be about 3,5 litres. There is not that much of a difference in terms of the time it would take to boil the water.

Activity 5 — Buying an urn

Your office is almost ready and you will soon be moving. Your manager asks you to buy an urn for the new office. A catering supply company faxes information about urns. This is given in the handout. There are 82 staff members. You need to work out what size urn to buy.

You will see that there is not much difference in the cost of the different sized urns. However, people have the bad habit of filling kettles and urns before boiling water. A bigger urn will take more water; therefore it will take longer to boil if it is filled and will use more electricity.

5.1 Work out how much water you need to make 82 cups of tea.

Remember that one teacup holds about 200 ml of water.

Some people drink mugs of tea. A mug holds 250 ml.

Remember also that the number of staff members may increase.

5.2 Now that you know how much water you need for 82 cups of tea, think about which urn is suitable for your office.

You request a buying order number for the new urn. However, Mrs de Klerk, who works in finances, has been at the company for 18 years and she phones you to tell you that there is an urn in the storeroom. It was placed there when the new water heaters were installed into the present kitchens. You ask David from the stockroom to bring it to you, because you would like to see if it is the correct size. David explains that he can get to it, but he cannot get it out of the storeroom as it has many things stacked in front of it. He gives you the following measurements:

Diameter: 21 cm
Height: 35 cm

You need to find out how you can work out how much water the urn will take. This will mean converting cubic centimetres into millilitres and converting millilitres into litres. The conversion tables are given on handout 5

Christo emails you the formula for working out the volume of a cylinder: this is on handout 5.

5.3 Use this formula to find out whether the urn is the correct size.

5.4 You explain to your manager that if you purchase another small urn the same size as the old urn, they hold enough water for the staff. She is worried that they will take too much water and take too long to boil. She asks you to find out what is the least amount of water that the urn can hold. She also asks you to compare this minimum amount of water the urn can hold with the amount of water that one boils in a kettle.

Make four drawings of an urn, with its lid off.

- Make one drawing from the top, showing the parts inside and outside.
- Make one drawing from the front.
- Make one drawing from the side.
- Making another drawing from the front - but this time pretend that the urn is transparent and show both the inside and outside parts.

Use your drawings to show what it is that limits the amount of water it can boil.

5.5 Now think about what measurements you need to get from David to find out what is the least amount of water that can be boiled at any one time.

5.6 David gives back your sketch with the measurements written on it. Work out what is the least water that the urn can boil.

Sizes of urns — fax from catering supplier

```
Urns
12 litre urn – R1020.00
20 litre urn – R1100.00
30 litre urn – R1150.00
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Converting between volume and capacity

$1 cm^3$ = 1 millilitre
$1 m^3$ = 1 000 decimetres
$1 dm^3$ = 1 litre
So $1 m^3$ = 1 000 litres

Christo's note explaining how to work out the volume of a cylinder

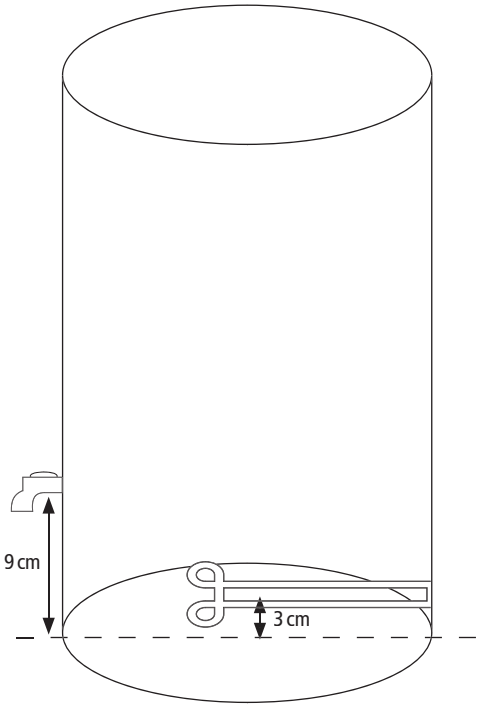
To work out the volume of many objects you multiply the area of the base of the object by the height of the object. Here is an example that you already know:

- Volume of cuboid = area of base (which is a rectangle) × height of cuboid = (length x breadth) × height

The base of a cylinder is a circle. You already know how to work out the area of a circle – you did this when you made circular table cloths.

Area of circle = πr^2

So then the volume of a cylinder = area of base × height
= $\pi r^2 \times h$



The measurements of the working part of the urn.

Activity 6 — Making decorations with paper folding

We begin this activity by exploring patterns and shapes cut out of folded paper. Learners make traditional shelving decorations by cutting patterns on paper with multiple folds. This lays the basis for an investigation into the use of symmetry and transformation of shape in traditional housing decorations, which is done in the next activity.

One of the outcomes range statements states that learners should consider the use of tessellations and symmetry in artifacts and in architecture. Activity 6 and activity 7 situate the mathematical concepts within the context of traditional interior and exterior home decoration. We set the scenario for learners as creating media for a housing conference.

At level 2 learners made cards by cutting out shapes on the fold-line of the card. They predicted what the shape would look like when they opened up the card. This was used to discuss symmetry and asymmetry. In this activity they extend what they know about symmetry and how it relates to patterns made by reflection through doing further paper folding activities.

Learners will use their knowledge of symmetry, gained in level 2, when they look at examples of traditional shelving decorations. Learners then apply what they know about symmetry to other activities: making cards and paper chains for an office birthday party.

This activity prepares learners to meet the following outcomes of Unit Standard 14108:
SO 2: Explore, describe and represent, interpret and justify geometrical relationships: AC 1, 4, 5

ABOUT THIS ACTIVITY
In this activity learners will draw on the images of paper cut-out shapes they developed in level 2 to further understand symmetry. Last year they explored symmetry through cutting shapes on the fold-lines of cards and predicting the results before unfolding the card to check. Learners used these images to understand bilateral symmetry.

Working physically and practically with shapes is the easiest way for learners to develop a sound but intuitive understanding of many geometrical concepts. People develop a good number sense by using numbers regularly, especially with lots of practice in putting them together and taking them apart. So too one can develop a sense of shape by regular practice with putting shapes together and pulling them apart. Work on transforming shapes lays a sound basis for an informal understanding of the properties of shapes under a range of conditions.

As learners work with transforming shapes they develop a set of mind pictures which they will use as the basis for solving problems with shapes and in space.

When learners have cut a shape on the folds they are asked to imagine what it will look like when they unfold it. This trains them to picture one sort of transformation of shape: the reflection of the shape about the line of symmetry and the combining of the two parts of the symmetrical shape. Once learners have some experience of doing this practically they can then begin to imagine and predict what the "unfolded" shapes will look like when they look at illustrations of shapes cut on a fold.

MANAGING THIS ACTIVITY
Help learners to understand the "make-believe context". The language describing the make- believe context is difficult, so it would be best for you to set the scene verbally with the class. Talk with them about the role of office administrator in planning workshops and conferences. Once they have understood the context and start to work practically with the activity they should have no problems.

6.1 Let learners talk about the shelving pattern in picture 1 of the handout. There are two ways this kind of shelving pattern is made:
- Sometimes people make them from clay or plaster.
- Sometimes people make them by folding and cutting paper such as newspaper.

First allow learners to talk freely about the pattern, but try to keep their attention focused on the pattern of the shelving decoration.

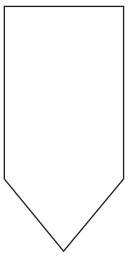
6.1.1 Some learners may know this kind of shelving decoration and others may not.

6.1.2 Yes, there are a number of lines of symmetry in the shelving decoration.

6.1.3 Learners will use their drawings to mark out the basic shape in question, but drawing the patterns will also help them to see the patterns and repetitions in it.

6.1.4 The three movements that they used to make patterns are:
- o Reflection or flipping
- o Rotation or turning
- o Translation or sliding

6.1.5



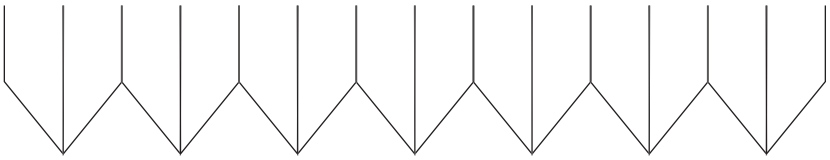
6.1.6 The pattern is made by reflecting the basic shape repeatedly.

6.1.7 The decoration is made by folding paper into a concertina or zig-zag fold and cutting a shape along one end of the paper.

It is the fold in the paper which creates the effect of the shape being reflected, but learners do not need to be able to explain this.

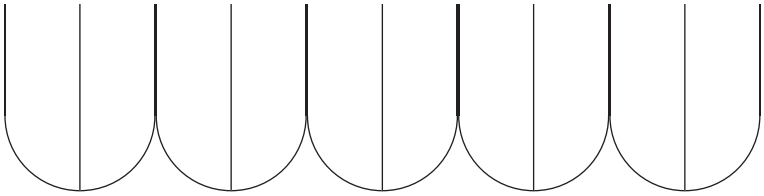
6.2 Learners should be given paper and scissors. Show them how to make a concertina or zig-zag fold. It will be much easier for learners to follow instructions than to have to follow the drawings on the handout to make sense of how to make a zig-zag fold.

Some learners may remember folding paper like this to make paper fans. A fold of about 4 cm works well on A4 paper. However, if learners are going to use their patterns to make shelving decorations then newspaper is best, as it has the length to run along most of the shelf and the width to line the shelf.

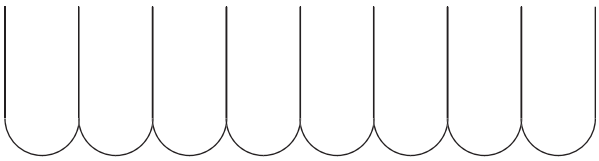


6.3 Let learners first fold the paper and then cut out the shapes on the fold line. Ask them first to draw what the shape will look like when it is unfolded. Then they should unfold the shape and check whether they were correct. Imagining shapes from pictures is always more technically difficult than working with the physical shape that you can handle, turn over and move. However, predicting the shapes will develop their ability to think visually.

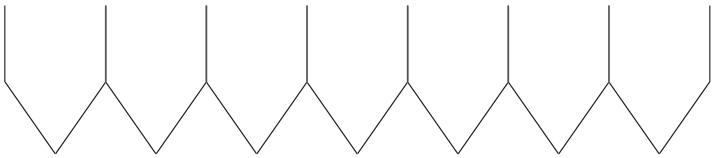
A



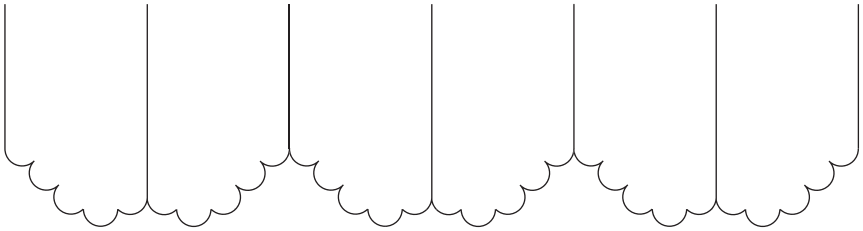
B



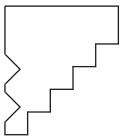
C



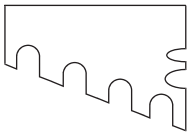
D



6.4



6.5



6.6 Some ways in which the shelving decorations could be used are:

- Making shelving patterns and using these to decorate shelves used for book displays.
- Making patterns from unprinted newsprint and using them to cover the information and/or registration tables.
- Running a competition for the best design and including some pictures and newsprint in the conference bags.

Learners may also have different ideas.

6.7 Remind learners about making chains of paper dolls. Various paper chains can be made e.g. hearts, aeroplanes, cars, fish, various other animals, flowers etc. It is important that learners know that they should ensure that the join between one shape and the next is wide enough to hold when the paper chain is hung up.

Further activities that learners could do are to make paper doilies and decorations for cards by folding and cutting paper squares and paper circles into quarters and eighths along the diagonals. Cut designs along the fold lines and edge lines. Predict what the patterns will look like when they unfold. Different cuts made in different places will give different designs. Talk to learners about what is the same about the designs and what is different about them.

Activity 6 — Making decorations with paper folding

You are employed by a construction firm which is planning an international conference on housing. Your task is to help with the conference preparations in all kinds of ways, including researching designs for the conference media. Your manager gives you the following brief about the conference.

Much of the present low-cost housing is of poor quality and is unattractive. The focus of the conference is on producing homes that people can be proud of and can afford. The aims of the conference are to investigate ways of :

- Providing large-scale cost-effective housing;
- Providing housing which people can be proud of – through investigating ways of incorporating the rich South African traditions of home decoration;
- Using local expertise and unemployed or underemployed people to assist with the project.

She asks you to look at traditional forms of home decoration. Luckily she gives you some examples for you to look at.

She asks you to look at them and prepare a presentation around them. In the presentation you should describe them to management and suggest how they could incorporate these designs into the conference media: conference logo, conference folders, conference posters, etc. She reminds you that several members of senior management like to think about patterns mathematically and suggests that you use mathematical terms in your descriptions.

6.1 Look at picture 1 on the handout. Describe what you see.

6.1.1 Did your granny or great-granny ever decorate her kitchen shelves with cut-out paper patterns like this?

6.1.2 You worked with symmetrical patterns last year. Is this pattern symmetrical?

6.1.3 Copy the pattern.

6.1.4 Last year you worked with three different ways of moving a basic shape to make a pattern. What are the three different movements?

6.1.5 Mark out what is the "basic shape" in the pattern above.

6.1.6 What kind of movement do you need to make with the "basic shape" to produce the pattern?

6.1.7 How do you think the cut-out paper pattern is made? Explain your ideas to a classmates.

6.2 Here is how to make one pattern for a shelving decoration.

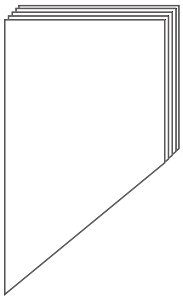
Take a sheet of paper – newspaper works well.

Fold it into a concertina fold – the handout describes how to do this.

Then cut off the bottom as shown in the picture alongside.

What do you think the pattern will look like when you unfold it?

Unfold the newspaper to check.



6.3 Now fold more sheets of paper and make the cuts A – D shown on the handout. Draw what you think the pattern of each decoration will look like.

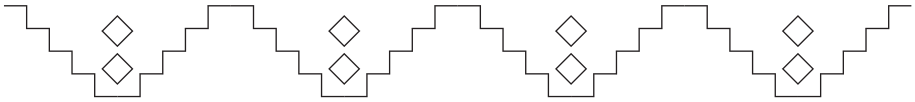
A

B

C

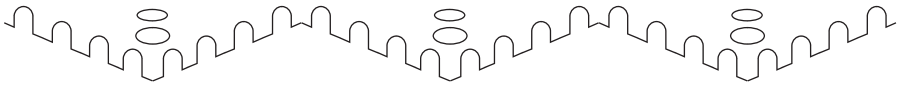
D

6.4 Here is a shelving pattern.



How do you have to cut the paper to get this pattern? Make a drawing first. Then fold and cut paper to see if you were correct.

6.5 Here is another shelving pattern. How do you have to cut the paper to get this pattern? Make a drawing first.



Fold and cut paper to see if you were correct.

6.6 Now think about using the shelving decorations for the conference.

6.6.1 Talk to a partner about how could you use traditional shelving patterns like this in a conference?

6.6.2 Write an explanation that you could give to management which describes how you could use the decorations and also describes the patterns mathematically.

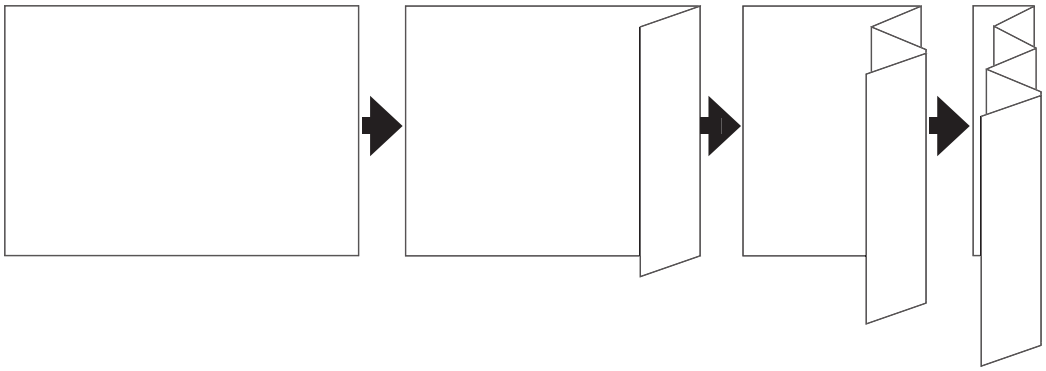
6.7 Now design some of your own paper decorations or paper chains by making cuts on concertina folds. Draw your basic shape below.

Now cut out your paper chain. Use your paper chains to decorate your classroom.

TRADITIONAL SHELVING PATTERNS

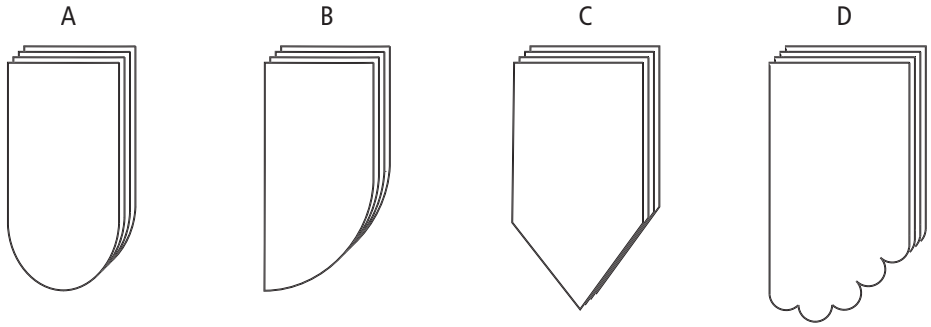
How to make a concertina fold out of paper

Take a sheet of paper and fold one end over



Then flip the paper over and make another fold like the first one, so that you have a zig-zag. Keep doing this until all the paper is folded like a concertina.

Some patterns for folding paper



Activity 7 — Traditional home decorations

In this activity learners explore more about making patterns by studying traditional mural decorations. This activity extends the work they did on pattern in level 2. It forms part of the housing conference context that was introduced in activity 6. It aims to encourage learners to draw on South Africa's rich cultural heritage in ways that not only develop their knowledge but can also be integrated into modern living.

ABOUT THIS ACTIVITY

In this activity learners copy and describe the patterns in a range of traditional mural decorations. They are then asked to either choose one of the designs or to make their own design and motivate how one could use it in the media prepared for a conference on local housing. This allows learners to investigate symmetry and transformations of shapes and to learn the related mathematical language. It allows them to see how the core or basic shape is repeated in different positions and orientations to make a design. All this prepares learners for making their own designs and describing them mathematically.

This activity prepares learners to meet the following outcomes of Unit Standard 14108:
SO 2: Explore, describe and represent, interpret and justify geometrical relationships: AC 1, 3, 4, 5

MANAGING THIS ACTIVITY

Learners should be given worksheet 7 and a copy of handout 7.

When learners copy the patterns it will help them to focus on the details and to see how the "basic shape" is repeated to create the pattern. Explaining how the shape can be moved in particular ways to make the pattern is difficult to do in writing. It is probably better to get learners to demonstrate this with a verbal explanation if necessary. They do not need the skill of explaining it in writing, only the experience of taking part of the pattern and imagining how to move it in different ways.

7.1 This is revision of what they have done at level 2 and level 3 in activity 7.

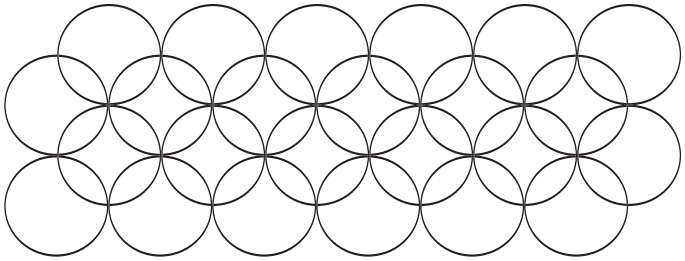
7.1.1 Slide or translate.

7.1.2 Turn or rotate.

7.1.3 Flip or reflect.

7.2 Learners should share their answers here, as not all learners may see all the possible ways to make the designs – especially since this involves taking different parts of the design as the "basic shape".

7.2.1

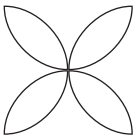


7.2.2 One way to draw the pattern is to make sets of overlapping circles: the circle can be the basic shape.
Another way is to make the petals of the flower the basic shape and to make the design by flipping or rotating the basic petal shape.

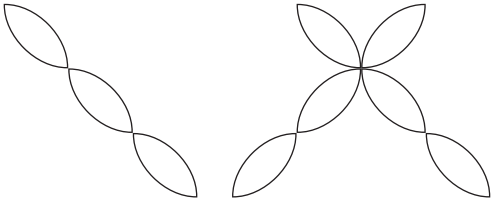
7.2.3.1 If you use the circle (or parts of circles) as the basic shape, then you can slide the circles into the correct positions.

7.2.3.2 If you use the petal shape as your basic shape then you can make the "flower" pattern by rotating the petal into 4 positions.

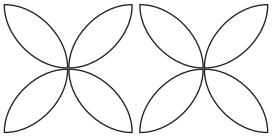
Since each flower shares petals with other flowers you can continue to do this until you have the complete pattern.



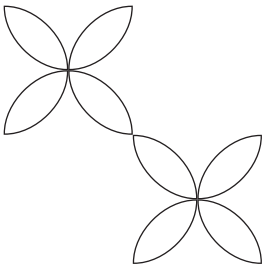
7.2.3.3 You can flip the petal shape 3 times vertically to make a diagonal row and then make a similar diagonal of petals by flipping one petal horizontally



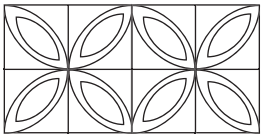
7.2.3.4 Once you have rotated the petal shape to get a flower pattern, you can use this as a secondary shape and repeat it by sliding it to new positions.



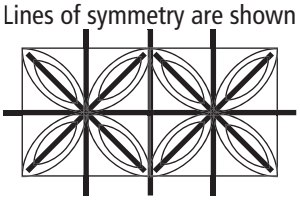
7.2.3.5 Similarly rotate the petal shape to get a flower pattern and then repeat this by flipping the flower shape into new positions.



7.3



7.3.1 Lines of symmetry are shown in bold.



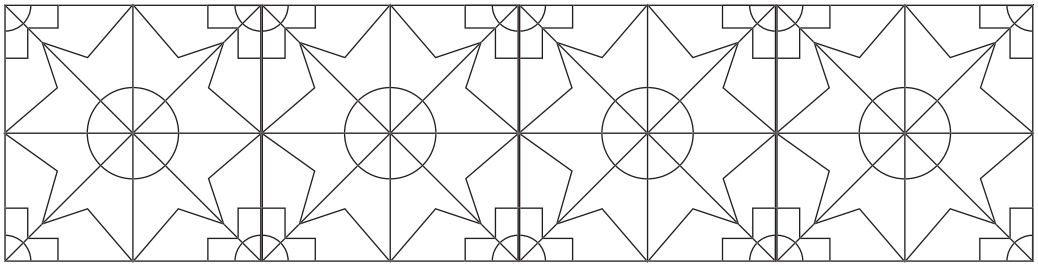
7.3.2.1 You can flip a square with the double petal pattern in it horizontally to get a row of V's and then flip each V- shape to get the second row

7.3.2.2 You can turn a square with the single petal pattern 90 degrees 4 times to make the larger square with the flower pattern in it, then slide this flower pattern along the row.

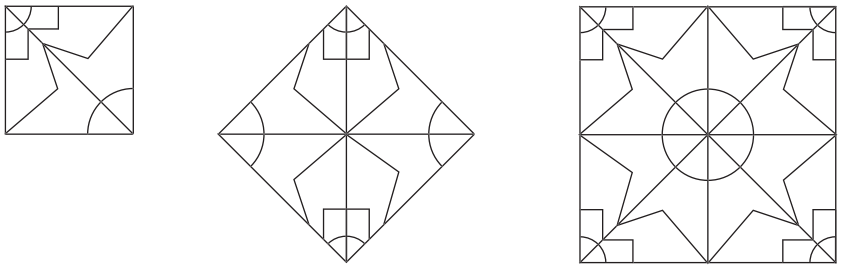
7.4 They both have a flower-type pattern made that can be made with a similar type of shape i.e.

7.5 The petal shape in the pattern in picture 1 is made to form a circular pattern and the pattern in picture 2 is framed by rectangles.

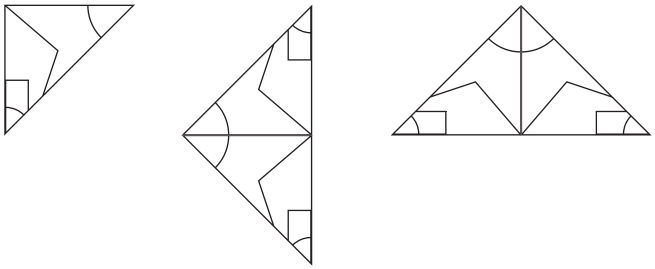
7.6



7.6.1



7.6.2

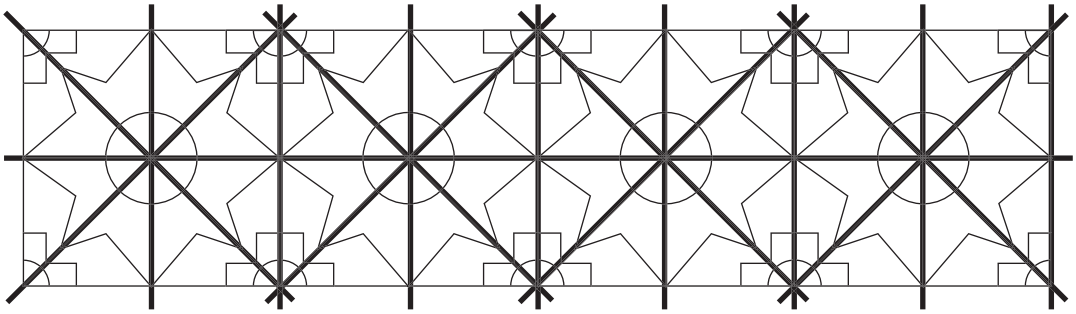


The two big triangles are exactly the same.They just face different directions.

7.6.3 If you use the small triangle as the basic shape, you can either

- o rotate it to make the large square and then slide it to start on the next large square; or you can
- o flip it repeatedly to make the top line of the pattern and then do the same to make the bottom line of the pattern.

7.6.4



7.7 In this question learners should draw on the concepts, designs and language that they have learned in this activity. Their answers will, however, all be different.

Activity 7 — Traditional home decorations

In many parts of South Africa woman have traditionally decorated the outer walls of their homes. In this activity we look closely at some of these patterns. This will help you to learn more about ways of using a simple shape to make a pattern and a decoration. Designs and patterns are usually made by repeating a shape. This can be a simple shape or a collection of shapes within shapes.

Remember, you are employed by a construction firm which is planning an international conference on housing. Your task is to help with the conference preparations in all kinds of ways including suggesting designs for the conference media. Your final task is to explain to management how they could incorporate these designs into the conference media: conference logo, conference folders, conference posters, etc.

7.1 Give three ways in which you can move a basic shape to make a pattern.

7.2 Many traditional mural paintings are based on flowers or plants.
7.2.1 Copy the pattern in picture 1.
7.2.2 Explain how you drew the pattern.
7.2.3 Explain how you can make the pattern from the basic shape by:
7.2.3.1 Only sliding or translating the basic shape.
7.2.3.2 Only rotating the basic shape.
7.2.3.3 Flipping it.
7.2.3.4 Rotating and sliding.
7.2.3.5 Rotating and flipping.

7.3 Copy the design in picture 2.
7.3.1 Is it symmetrical? If so, how many lines of symmetry can you find?
7.3.2 Explain how you can make this pattern by:
7.3.2.1 Flipping only
7.3.2.2 Rotating and flipping.

7.4 What is the same about the patterns in pictures 1 and 2?

7.5 What is different about the patterns in pictures 1 and 2?

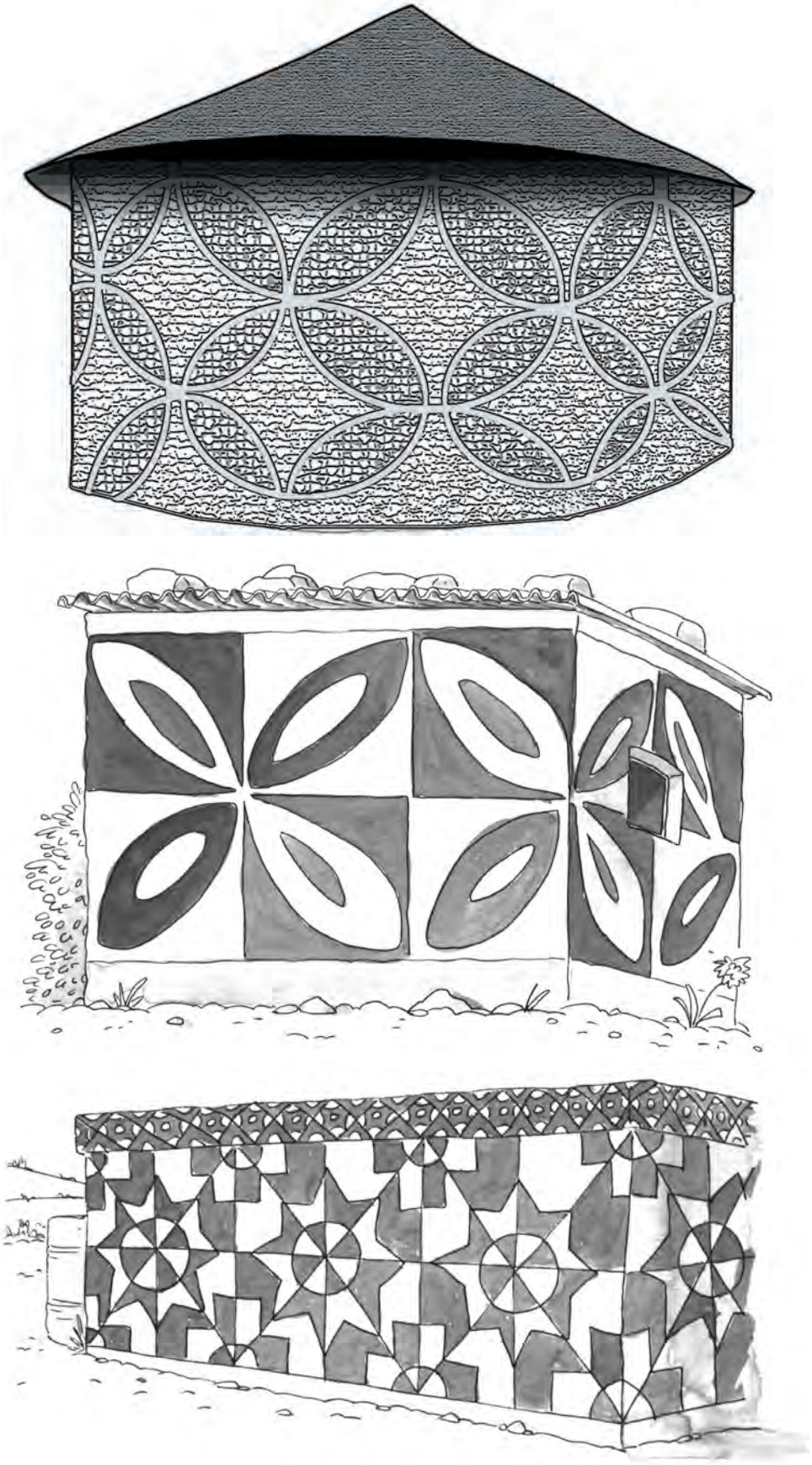
7.6 Copy the main pattern on the wall in picture 3, i.e. ignore the top border pattern.
7.6.1 Show a partner the 3 different sized squares in the pattern. Two of these can each be thought of as a "basic shape" that is repeated.
7.6.2 Now look for two triangular patterns that can be used as the "basic shape".
7.6.3 Explain how you can move the smaller of the two triangles in two different ways to make the pattern.
7.6.4 Mark all the lines of symmetry you can find in your drawing of the pattern.

7.7 Choose one or more designs to use for the conference media. Alternatively you can make up your own pattern.
7.7.1 First talk to a partner about the pattern. Describe the pattern mathematically by talking about it and showing:
- what the basic shape in the pattern is;
- any lines of symmetry; and
- how the basic shape is moved to make the pattern.

7.7.2 Then talk to a partner about how you could use the pattern in the conference media.
7.7.3 Now write an illustrated report in which you:
- Draw your choice of design.
- Explain the pattern mathematically.
- Say how you would use the pattern in the conference media.

Remember that several members of senior management like to think about patterns mathematically and so use mathematical terms in your descriptions.

Picture 1: Sotho mural art on homestead, made by pressing stones into wet plaster



Activity 8 — Assessment

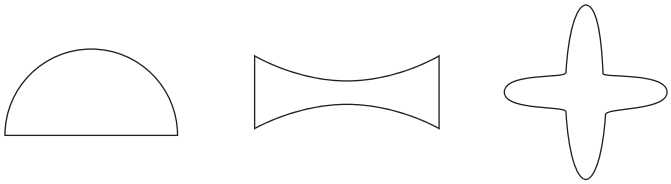
Symmetry, transformations and designs in traditional home decorations

In this assessment learners work with the knowledge that they have gained about designs and patterns: the focus in on symmetry, rotations, reflections and translations. To make the assessment less complex we have placed the assessment within the same context as the related activities, namely traditional mural patterns.

MANAGING THIS ASSESSMENT
Learners should be given Worksheet 8 and a copy of Handout 8.

8.1
- Slide or translate.
- Turn or rotate.
- Flip or reflect.

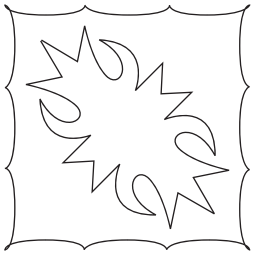
8.2.1



8.2.2 These shapes are translated or slid.

8.2.3 Learners' drawings will all be different.

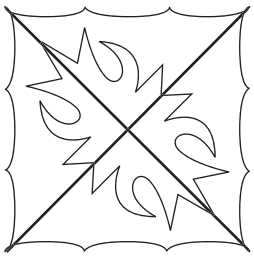
8.3



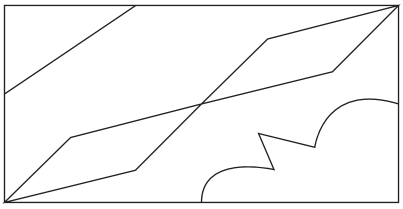
8.3.1 Flipped repeatedly to make up the top row and then flipped again to make up the bottom row.

Some learners may also talk about rotating it to so that 4 parts together form a square. If the basic shape is seen as a square this could also work. If the basic shape is seen as a rectangle, this does not work.

8.3.2



8.4



8.4.1 This square can either be:

- o Rotated to make the larger square and then the larger square slid to make up the pattern.
- o Flipped repeatedly to make up the top row and then flipped again to make up the bottom row.

8.4.2 There are no lines of symmetry in this shape. If the triangle in the top left hand corner were an isosceles triangle, then it would have a line of symmetry running diagonally across it from the top right hand corner to the bottom left hand corner.

Activity 8 — Assessment

Symmetry, transformations and designs in traditional home decorations

In this assessment you will be working with symmetry, as well as translations, rotations and reflections. To make the assessment easier we will continue to use the housing conference context that we used before.

8.1 Give three ways in which you can move a basic shape to make a pattern.

8.2 Picture 1 shows border patterns.

8.2.1 Draw the 3 basic shapes used to make the border patterns.

8.2.2 How are the shapes moved to make the patterns?

8.2.3 Make your own border pattern.

8.3 Draw the basic shape used to make the pattern in picture 2.

8.3.1 How is this shape moved to make the pattern?

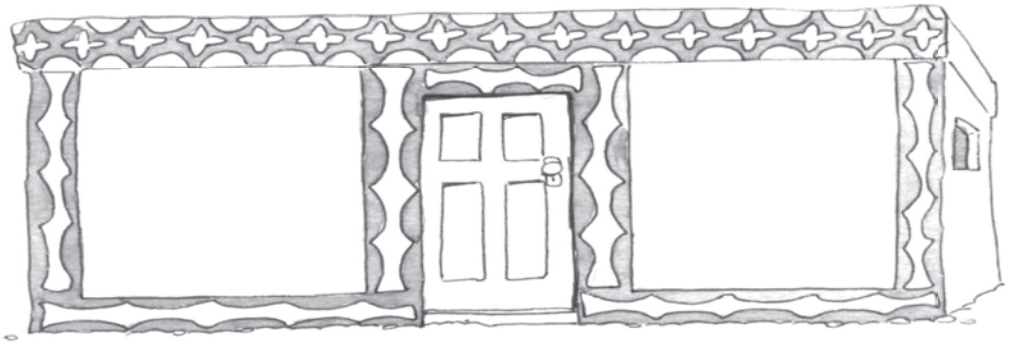
8.3.2 Does this basic shape have any lines of symmetry? If so, draw them in.

8.4 Draw the basic shape used to make the pattern in picture 3.

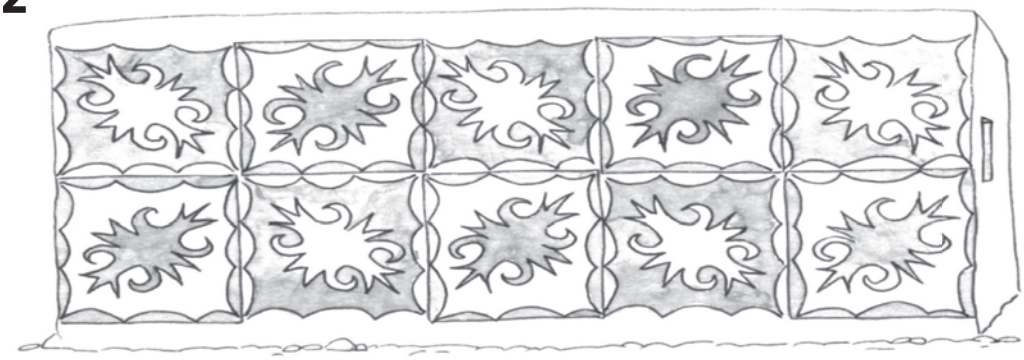
8.4.1 How is this shape moved to make the pattern?

8.4.2 Does this basic shape have any lines of symmetry? If so draw them in.

1



2



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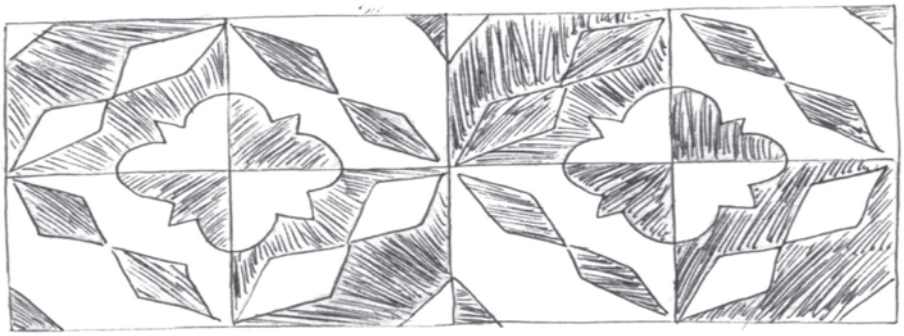
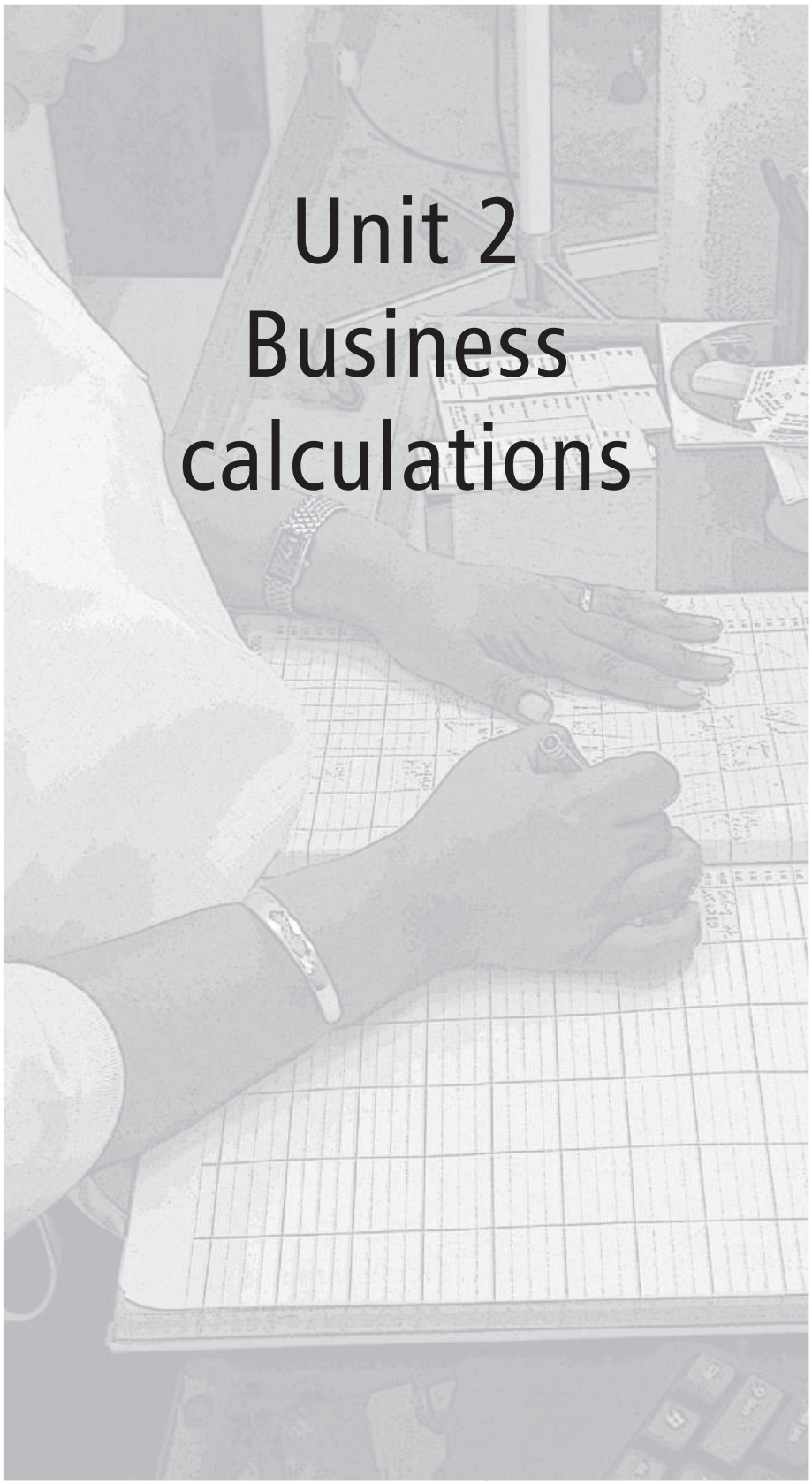


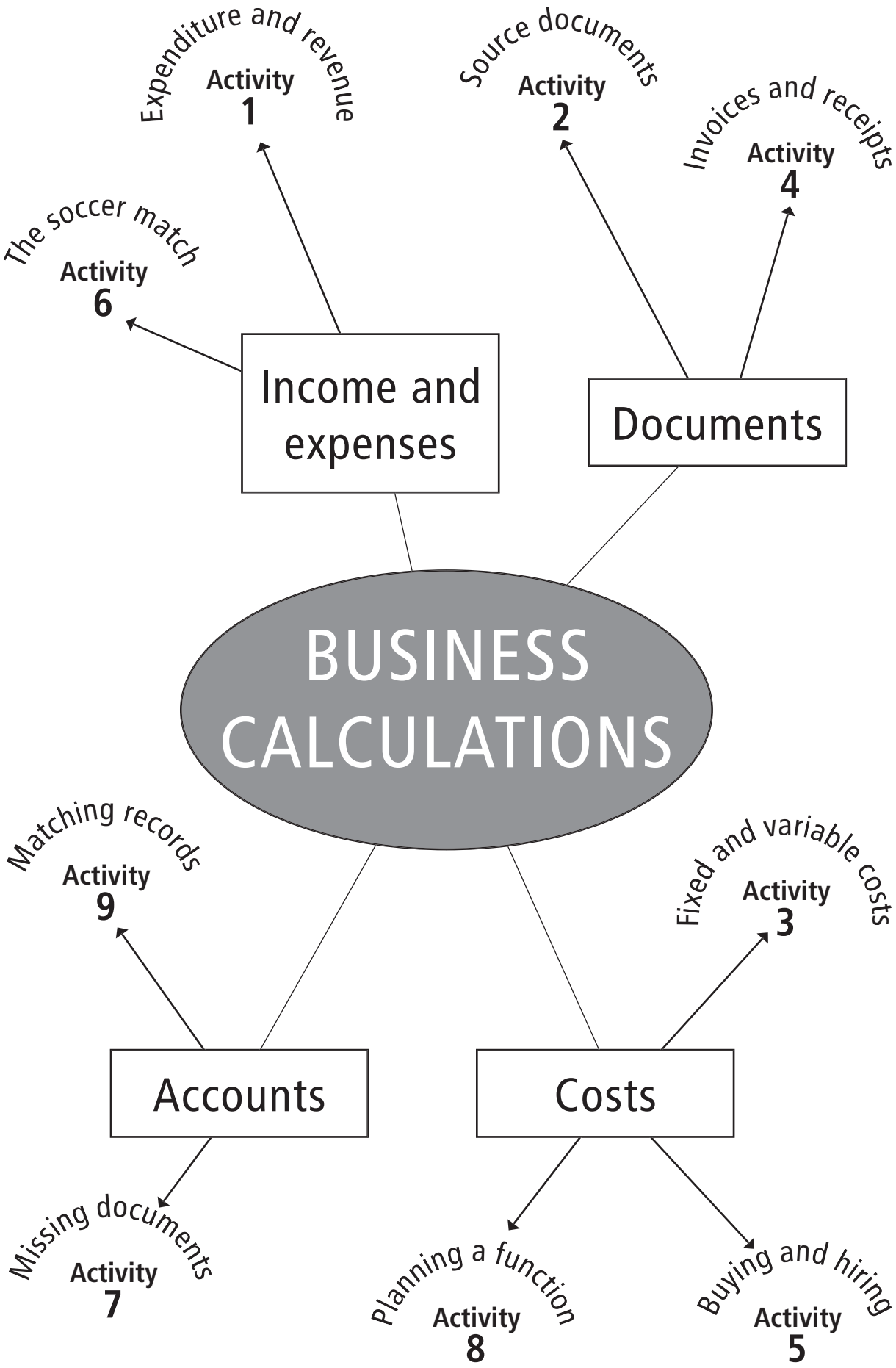
Mathematical Literacy

NQF LEVEL 3



Unit 2 Business calculations

Generic Business Administration


BUSINESS CALCULATIONS
Income and expenses
Documents
Accounts
Costs
Expenditure and revenue
Activity 1
Source documents
Activity 2
Invoices and receipts
Activity 4
The soccer match
Activity 6
Matching records
Activity 9
Fixed and variable costs
Activity 3
Missing documents
Activity 7
Planning a function
Activity 8
Buying and hiring
Activity 5

Overview

In this unit students develop a variety of mathematical skills including:

- Working with expenditure and revenue in the context of a small catering business.
- Identifying various types of source documents and understanding the importance of keeping accurate records.
- Understanding the difference between fixed and variable costs.
- Organising and presenting financial information.
- Understanding the costs relative to a transaction in the context of a sports club.
- Working with different tariffs in the context of organising a soccer match.
- Reconciling transactions with statements of account and identifying shortfalls and refunds after a soccer match.
- Comparing two different financial scenarios and making decisions based on the costs of arranging a function.
- Performing invoicing operations and writing receipts.
- Comparing documents with records and identifying discrepancies.

Activity 1 — Expenditure and revenue
This is a preliminary activity designed to introduce students to the ideas of expenditure and revenue in the context of a small catering business. Students calculate the costs of producing a product and then calculate how many products need to be sold in order to cover costs as well as make a profit. Hence they distinguish between expenditure and revenue and demonstrate an understanding of the costs of a transaction.

Activity 2 — Source documents
In this activity students work with source documents. They identify the types of documents that are used to keep a record of financial transactions in a business and discuss the importance of recording all these transactions. They analyse the features of various different documents and thus identify items of disbursement and revenue from source documents. They also issue a receipt and an invoice and fill in a cheque counterfoil.

Activity 3 — Fixed and variable costs
In this activity students work with the idea of fixed and variable costs. They examine the income statement of a local sports club, perform various calculations, and analyse the circumstances in which cost items can be fixed or variable.

Activity 4 — Invoices and receipts
This activity consolidates ideas from previous activities and so is suitable for assessment purposes. Students organise financial information that has been presented in a variety of different ways, and display it on a table that shows the details of each transaction. They also identify income, expense, fixed and variable costs, and calculate surplus (deficit).

Unit outcomes

The following Unit Standards, Specific Outcomes and Assessment Criteria are addressed by this unit:

Perform routine financial transactions and calculations. (Math Lit.11241)

- Demonstrate the ability to consider a range of options, make decisions about and evidence performance around each of the specific outcomes (SO1).
  - Distinguish between items of expenditure and revenue (AC1).
  - Differentiate between fixed and variable costs (AC2).
  - Perform invoicing operations and post amounts to appropriate accounts (AC3)
  - Reconcile individual transactions with statements of accounts (AC4).
  - Identify items disbursed to be recovered by invoicing (AC5).
- Apply competence in components of practice (SO2).
  - From source documents, identify items of disbursement and revenue (AC1).
  - Demonstrate an understanding of the effect of costs relative to a transaction (AC2).
  - Identify the circumstances in which cost items can be fixed or variable (AC3).
  - From source documents, allocate cost items to the appropriate accounts and apply relevant client tariffs (AC4).
  - By comparing company books and accounts, initiate recovery of shortfalls and refunding of excesses (AC5).

Activity 5 — Buying and hiring
This activity involves the effect of costs relative to a transaction. Students prepare invoices and use documents that require them to calculate costs and also to offset costs against revenue. The context is the sports club again, and the transactions involve improvements to the facilities so that they can be hired out.

Activity 6 — The soccer match
In this activity students calculate expenditure and revenue in the context of a soccer match. They identify costs relative to a possible transaction and compare these with available revenue. They work with different tariffs and calculate how these impact on income and expenditure.

Activity 7 — Missing documents
In this activity students reconcile transactions with records and accounts. They identify items that are missing and begin the recovery process. They work with shortfalls and refunds, and are expected to perform calculations demonstrating an understanding of how these affect income. The context is balancing the finances after a soccer match.

Activity 8 — Planning a function
In this activity students work with variable costs and make decisions based on the calculation of expenditure. They compare two different scenarios and adjust their calculations accordingly. They identify circumstances in which costs can be fixed or variable and demonstrate an understanding of the costs relative to different transactions.

Activity 9 — Matching records
In this activity students compare transaction amounts recorded in a company's books with source documents. They reconcile individual transactions with statements, fill in outstanding amounts, complete receipts and counterfoils and allocate items to the correct accounts. The company is once again the sports club, and students examine the monthly statements.

11241	**Perform Basic Business Calculations**										
		ACTIVITY	1	2	3	4	5	6	7	8	9
SO1	The learner must demonstrate the ability to consider a range of options.										
	AC1	Distinguish between items of expenditure and revenue.	✓	✓	✓	✓	✓	✓		✓	✓
	AC2	Differentiate between fixed and variable costs.			✓	✓		✓		✓	✓
	AC3	Perform invoicing operations and post amounts to the appropriate accounts.		✓			✓		✓		
	AC4	Reconcile individual transactions with statements of accounts.			✓	✓			✓		✓
	AC5	Identify the items disbursed on behalf of the organisation to be recovered in the invoicing process.					✓	✓	✓		✓
SO2	A composite statement of outcomes which expresses applied competence.										
	AC1	From source documents, identify items of disbursement and revenue.		✓		✓		✓	✓	✓	✓
	AC2	Demonstrate an understanding of the effect of costs relative to the transaction.	✓			✓	✓	✓	✓	✓	
	AC3	Identify the circumstances in which cost items can be fixed and/or variable.			✓	✓				✓	
	AC4	From source documents, allocate cost items to the appropriate accounts and apply relevant client tariffs for the calculation of revenue and prepare invoices in a predetermined format.				✓	✓	✓	✓		✓
	AC5	Compare transaction amounts which have been recorded in the company`s books with those reflected on third party statements, and initiate the recovery of shortfalls and the refunding of excesses.							✓		✓

Activity 1 — Expenditure and revenue

ABOUT THIS ACTIVITY

This is a preliminary activity designed to introduce students to the ideas of expenditure and revenue in the context of a small catering business. Students calculate the costs of producing a product and then calculate how many products need to be sold in order to cover costs as well as make a profit. Hence they distinguish between expenditure and revenue and demonstrate an understanding of the costs of a transaction. The Specific Outcomes and Assessments Criteria addressed are SO1: AC1; and SO2: AC2 of Unit Standard 11241.

MANAGING THIS ACTIVITY

This activity could be introduced by asking students what they think the purpose of any business is and what they understand by the words 'expenditure' and 'revenue'. Make sure that your discussion covers the following points. The purpose of any business is to make a profit. Expenditure and revenue are more formal words for income and expenses. Revenue is the amount of money that you as a producer will receive when you sell your product and expenditure is any money that you spend running your business and producing your product. Two important formulae students need to be familiar with are:

Revenue = Quantity sold × Price of one; Profit = Revenue - Expenditure.

Students should each receive a copy of handout 1 and worksheet 1.

1.1 The completed table shows that bobotie for 24 costs the business R188,80.

Cost of producing bobotie for 24 people		
Ingredient	Cost	
6 kg mince beef @ R25,98 per kg	6 × R25,98 =	R155,88
12 onions @ 70c each	12 × 70c =	R8,40
3 tins tomato puree @ R1,50 each	3 × R1,50 =	R4,50
3 tins tomato paste @ R1,09 each	3 × R1,09 =	R3,27
Bread		R2,50
Milk		R2,50
3 eggs @ R15 per dozen	15 ÷ 12 × 3 =	R3,75
Spices, chutney, jam		R3,50
Raisins etc.		R4,50
TOTAL		**R188,80**

1.2 A large bobotie needs to cater for 8 which is one third of the cost of catering for 24 (as in the table above), so divide R188,80 by 3 to get R62,93 in order to break even.

1.3 A large bobotie sells at R98, so profit is R98 - R62,93 = R35,07.

1.4 The profit on each is R35,07, so to earn R2 000 profit divide R2 000 by R35,07 to get 57 large boboties.

1.5 Buying a large bobotie for R98 is more economical than buying 8 small boboties which would cost 8 × R15 = R120.

1.6 The total revenue for February is R23 252 and the total expenditure is R23 639, as shown in the table below:

Revenue (income)		Expenditure (expenses)	
Item	Amount	Item	Amount
Chicken breyani	25 × 85 = R2 125	Rent	R3 200
Lamb breyani	30 × 90 = R2 700	Supplies	R5 980
Lasagne	R2 050	Stationery	R225
Bobotie	24 × 98 = R2 352	Telephone	R350
Butternut casserole	10 × 40 = R400	Electricity	R389
Beef curry	20 × 96 = R1 920	Delivery+collection	R495
Lamb curry	25 × 48 = R1 200	Salaries	3 ×R4000 = R12 000
21st function	R7 580		
Function beef lasag.	15 × R105 = R1 575		
Function veg. lasag.	15 × R90 = R1 350		
TOTAL REVENUE:	**R23 252**	**TOTAL EXPENDITURE:**	**R22 639**

1.7 They made a small profit of R613 in February.

1.8 The staff who were paid an expected salary would probably be happy. The owner, on the other hand, would not be happy to receive a total of R613 as salary and profit!

1.9 By far the largest single expense to the business is salaries.

Single portions were seldom bought, possibly because they are relatively more expensive or because people generally use a caterer for a crowd of people.

Activity 1 — Expenditure and revenue

"Delicious Dishes" is a small catering business run by an owner and three employees. They rent premises consisting of a kitchen at the back and an office with counter at the front. As it is a small business, all four people are involved at various times with all aspects of the business. These include ordering supplies, cooking and packaging products, taking orders from clients, telephone and cash till duties, deliveries, and keeping track of the finances. On handout 1 you are given a menu and price list showing the types and sizes of dishes on sale. You are also given various prices of ingredients and a record of one month's activities at "Delicious Dishes". Use this information to answer the following questions:

1.1 Fill in the table below to help you calculate the cost to the business of making bobotie for 24 people (ignore the cost of electricity, rental, packaging etc).

Cost of producing bobotie for 24 people	
Ingredient	Cost
TOTAL	

1.2 What would the price of a large bobotie be in order to break even (that is, just to cover costs without making a profit)?

1.3 How much profit is "Delicious Dishes" making on each large bobotie?

1.4 How many large boboties would have to be sold to make a profit of R2 000?

1.5 Is it more economical for a customer to buy a large bobotie or 8 small boboties? Explain your answer.

1.6 Refer to the list of activities for the month and use the table below to help you calculate the total revenue and expenditure of "Delicious Dishes" for the month of February:

Revenue (income)		Expenditure (expenses)	
Item	Amount	Item	Amount
TOTAL REVENUE:		**TOTAL EXPENDITURE:**	

1.7 Did "Delicious Dishes" make a profit or a loss in February? How much?

1.8 Do you think all four people in the business are satisfied with the activities of February? Explain your answer.

1.9 What is the largest single expense to the business?

1.10 Are there items on the menu that seem unpopular and can you suggest a reason for this?

INFORMATION SHEET

Delicious Dishes — Menu and Price List			
	Small - serves 1	Medium - serves 4	Large - serves 8
Bobotie	R15	R49	R98
Lasagne (with beef)	R14	R50	R105
Lasagne (vegetarian)	R12,50	R45	R90
Beef curry	R14,50	R48	R96
Lamb curry	R14,50	R48	R96
Breyani (chicken)	R12,50	R42	R85
Breyani (lamb)	R13	R45	R90
Butternut casserole	R12	R40	R80

INGREDIENTS AND PRICES FOR BOBOTIE SERVING 24 PEOPLE

6 kg mince beef @ R25,98 per kg
12 onions @ 70c each
3 tins tomato puree @ R1,50 each
3 tins tomato paste @ R1,09 each
1 loaf bread at R2,50
1 litre milk at R2,50
3 eggs at R15 per dozen
Spices, chutney, jam at R3,50
Raisins, lemon, Worcester sauce R4,50

A LIST OF THE ACTIVITIES AT "DELICIOUS DISHES" FOR ONE MONTH

February 1.	Paid rent for the premises: R3 200.
February 3.	Sold 25 large chicken breyani and 30 large lamb breyani.
February 4.	Collected monthly supplies: a total of R5 980 was paid to the supplier.
February 5.	Sold lasagne to the value of R2 050.
February 6.	Paid stationery bill of R225 and telephone bill of R350.
February 10.	Sold 24 large bobotie and 10 medium butternut casseroles.
February 11.	Sold 20 large beef curry and 25 medium lamb curry.
February 15.	Paid electricity bill of R389 and paid deliveries and collections: R495.
February 20.	Paid salaries: R4 000 to each of 3 employees.
February 21.	Catered for a 21st birthday party and received R7 580.
February 25.	Catered for a function: lasagne for 240 people (half beef, half vegetarian).

Activity 2 — Source documents

ABOUT THIS ACTIVITY

In this activity students work with source documents. They identify the types of documents that are used to keep a record of financial transactions in a business and discuss the importance of recording all these transactions. They analyse the features of various different documents and thus identify items of disbursement and revenue from source documents. They also issue a receipt and an invoice and fill in a cheque counterfoil. The Specific Outcomes and Assessment Criteria addressed are SO1: AC1, 3; and SO2: AC1 of Unit Standard 11241.

MANAGING THIS ACTIVITY

This activity could be introduced by a class discussion where the following three questions are put to students for their input and ideas:

Why is it important for a business to keep records of its financial activities?

What are some of the different types of financial transactions that take place regularly in any business?

How many different 'bits of paper' can you think of that record financial activity?

Make sure that the class discussion covers the following ideas. If precise records are not kept, producers are not aware of how much they are earning and therefore how much they can spend without going into debt. They are not able to plan or expand and the business may lose money without anyone being aware of it.

A transaction is any activity that involves the exchange of money. Different types of transactions include:

- costs of equipment and materials eg. machines, fresh produce
- running expenses eg. rent
- salaries of employees
- payments of accounts
- product sales

The 'bits of paper' that prove a transaction has taken place are called source documents. Some examples of source documents are:

- the cash register roll (the customer keeps the till slip, the business keeps the roll)
- receipts (the customer has the original, the business keeps the carbon duplicate)
- the cheque counterfoil (the stub left after tearing out a cheque) or carbonised cheque duplicate in some cheque books
- invoices (both those issued and those received).

Students should receive copies of handout 2 and worksheet 2.

2.1 The receipt issued to S. Smith is the only document recording money received. The amount received was R980.

2.2 The invoice from Vegetable Supplies records that "Delicious Dishes" needs to pay them R270,75 and the cheque counterfoil records that R450,57 was paid to Telkom. Therefore the total paid out was R721,31. Mention to students that a more formal word for money that is paid out is disbursement.

2.3 Yes, all three source documents are dated 2nd May 2005.

2.4 The receipt number is 23 and the transaction that took place is that S. Smith paid an amount of R980 to "Delicious Dishes" for 10 large boboties.

2.5 Invoice No.124 was received by "Delicious Dishes" because they owe the money. It was issued by Vegetable Supplies.

2.6 To get R237,50 we add the four given amounts: R142,50 + R24 + R17,80 + R53,20 = R237,50. To get R33,25 we calculate 14% of R237,50 which is 14 ÷ 100 × R237,50 = R33,25.

2.7 The number on the cheque counterfoil is 002. "Delicious Dishes" paid Telkom R450,57 in payment of the telephone bill.

2.8 The figure R9 980,46 on the counterfoil indicates that the balance in the cheque account was this amount before the current cheque was written.

2.9 The blank space indicates that nothing has been deposited into the cheque account since the last cheque was written.

2.10 R9 980,46 - R450,57 = R9 529,89.

2.11 The receipt should show the following:

RECEIPT No: 34

Date: 15 June 2005

Received from: S. Khan

The sum of: One thousand rand only

For: 25 medium butternut casseroles

Signed: Thandi

For: Delicious Dishes

2.12 25 medium butternut casseroles @ R40 each is 25 × R40 = R1 000. VAT would be 14% of this which is 14 ÷ 100 × R1000 = R140.

2.13 The invoice should indicate the following:

TAX INVOICE NO: 95
BELASTING FAKTUUR DATE: 4 April 2005

TO/AAN: K. Monare

SUPPLIED BY: Delicious Dishes
VERSKAF DEUR:
ADDRESS: 7 Church Street, Industrial Park
ADRESS:

		R	C
2 large beef lasagne @ R105		210	00
5 medium bobotie @ R49		245	00
12 large butternut casserole @ R80		960	00
Total		1 415	00
VAT (14%)		198	10
TOTAL		1 613	10

2.14 The cheque counterfoil should show the following:

No. 006

Date: 5 May 2005
To: City Council
For: Electricity

	R	C
Previous bal.	5400	00
Deposit	500	00
Total	5 900	00
This cheque	375	00
Balance	5 525	00

Activity 2 — Source documents

On handout 2 you have been given three source documents from the records of the catering business "Delicious Dishes", introduced in activity 1. There is a receipt, an invoice and a cheque counterfoil. The following questions apply to these documents.

2.1 Which of the given documents records money that has been received by "Delicious Dishes"? How much is this?

2.2 Which documents record money paid out by "Delicious Dishes"? How much is this?

2.3 Were all these documents written on the same day? Explain your answer.

2.4 What was the receipt number of the document issued to S. Smith? What transaction took place here?

2.5 Consider invoice no. 124. Was this invoice issued by, or received by, "Delicious Dishes"? Explain your answer.

2.6 Show the calculations that were done to arrive at the numbers R237,50 and R33,25 on invoice no. 124.

2.7 What is the number of the cheque counterfoil? Explain 'who paid whom?' , 'how much?' and 'for what?'

2.8 What do you understand by the figure R9 980,46 on the cheque counterfoil?

2.9 Why is there a blank space for deposit on the counterfoil?

2.10 Show the calculation that was done to get the number R9 529,89.

2.11 Using the blank document below, issue a receipt as follows: On 15th June 2005, "Delicious Dishes" received a payment of R1 000 from S. Khan for 25 medium butternut casseroles. Thandi wrote out the receipt which was no. 34.

RECEIPT No: .....

Date: .....

Received from: .....

The sum of: .....

For: .....

Signed: .....Thandi.....

For: Delicious Dishes

2.12 Show by calculation that R1 000 was the correct payment by S. Khan in 2.11 above and calculate the amount of VAT (at 14%) he would have to pay if "Delicious Dishes" was obliged to charge VAT.

2.13 Using the blank document below issue an invoice to K. Monare for 2 large beef lasagnes, 5 medium boboties and 12 large butternut casseroles. It is invoice number 95 and the date of issue is 4 April 2005. Refer to handout 1 for prices.

TAX INVOICE NO:.....
BELASTING FAKTUUR DATE:.....

TO/AAN: K. Monare

SUPPLIED BY: .....
VERSKAF DEUR:
ADDRESS: .....
ADRESS:

		R	C
VAT (14%)			
TOTAL			

2.14 Fill in the blank cheque counterfoil below, showing that you wrote a cheque to the city council for electricity to the value of R375 on the 5th May 2005. Before writing out the cheque your cheque account balance was R5 400 and you have made a R500 deposit since you last wrote out a cheque.

No. 006
Date: .....
To: .....
For: .....

	R	C
Previous bal.		
Deposit		
Total		
This cheque		
Balance		

SOURCE DOCUMENTS

RECEIPT No: 23

Date: 2 May 2005

Received from: S. Smith

The sum of: Nine hundred and eighty rand

For: 10 large bobotie

Signed: Thandi

For: Delicious Dishes

VEGETABLE SUPPLIES
12 Park Street, Woodside
Tel: (021) 149-5689

INVOICE
NO: 124

DATE: 2 May 2005

To: Delicious Dishes
7 Church Street, Industrial Park

Brought from: Vegetable Supplies

38 butternuts @ R3,75 each	R142,50
2 boxes tomatoes @ R12 per box	R24,00
2 bags onions @ R8,90 per bag	R17,80
Courgettes, brinjals, peppers	R53,20
TOTAL	R237,50
VAT (14%)	R33,25
TOTAL	R270,75

No. 002

Date: 2 May 2005
To: Telkom
For: Telephone bill

	R	C
Previous bal.	9 980	46
Deposit		
Total		
This cheque	450	57
Balance	9 529	89

Activity 3 — Fixed and variable costs

ABOUT THIS ACTIVITY

In this activity students work with the idea of fixed and variable cost. They examine the income statement of a local sports club, perform various calculations, and analyse the circumstances in which cost items can be fixed or variable. The Specific Outcomes and Assessment Criteria addressed are SO1: AC1, 2, 4; and SO2: AC3 of Unit Standard 11241.

MANAGING THIS ACTIVITY

Discuss with students the fact that some costs in a business are the same every month regardless of how much business is done or how many products are sold. We call these 'fixed' costs. Examples of fixed costs include rent (which is usually fixed for the year), and salaries of permanent employees. 'Variable' costs are costs which change (vary) depending on how many products you produce. If you produce more, you need more materials and more workers, so your variable costs will be higher. Costs such as electricity, water and telephone have to be paid every month, and although we can estimate approximately how much we will need to pay, they are variable costs because the amounts of electricity and water vary according to our needs and of course telephone costs vary depending on how many calls we make.

Students should each receive a copy of handout 3 and worksheet 3.

3.1 The sources of income are: subscriptions (full members, junior members and family memberships), ticket sales, donations and the hire of facilities.

3.2 The three largest expenses are: i) salaries and wages (R45 560,09), ii) interest on the overdraft facility (R12 000) and iii) repairs and maintenance (R4 589,21).

3.3 The figures have been put in boxes to indicate that they are the parts that make up the whole category. For example, the total figure for 'subscriptions' (R51 397,68) is found by adding full, junior and family subscriptions together (R35 698,25 + R11 012,20 + R4 687,23 = R51 397,68). The 'other income' of R42 338,46 is found by adding ticket sales, donations and hire of facilities:
(R12 898,56 + R23 459,90 + R5 980,00 = R42 338,46).

3.4 The total income is R93 736,14, found by adding subscriptions and other income
(R51 397,68 + R42 338,46 = R93 736,14).
Alternatively, you could add all the parts of the categories to reach the same total.

3.5 No. You can see what they paid but not how many there were.

3.6 The time period is one year (2004).

3.7 To find the annual subscription for full members, take the total paid by full members for the year and divide by the number of full members: R35 698,25 ÷ 70 = R509,98 per year.

3.8 To find the monthly subscription for junior members, take the annual total paid by juniors and divide by the number of junior members to find their annual subscription. Divide this by 12 to find the monthly subscription: (R11 012,20 ÷ 36) ÷ 12 = R25,49.

3.9 To find the average monthly telephone cost, take the total annual telephone cost and divide by 12 months: R2 650,89 ÷ 12 = R220,91.

3.10 The fixed costs are the interest on the overdraft facility, and salaries and wages. These costs stay the same each month, regardless of how many members there are or how many tickets are sold etc.

3.11 The variable costs are electricity, cleaning materials, first aid, repairs and maintenance, telephone and water. These costs vary each month depending on how many people are using the facilities.

3.12 Yes. There is a net surplus of R24 551,43 which is a substantial amount of the annual turnover, and this amount could be spent on chairs, new equipment or repairs.

3.13 The club does not pay rent, but does pay interest on an overdraft. This suggests that the club bought the property and is paying it off. This is not certain, however, and it could be owned by someone else who is allowing it to be used rent free.

3.14 The monthly repayment is R1 000 (R12 000 ÷ 12 months = R1 000).

Activity 3 — Fixed and variable cost

Jacob has recently been given the task of running the finances of the local sports club. He knows that the club has three fields, some spectator stands, a hall with tables and a few chairs, and a small office with a desk, telephone and some of the club records. In order to understand how it was managed in the past, and to help him make decisions about the future, Jacob asked for a copy of the 2004 income statement for the club. Use this statement (given on handout 3) to answer the following questions:

3.1 Name all the different sources of income of the club.

3.2 List the three largest expenses.

3.3 Study the figures in the boxes under income. Why do you think they have been put in boxes? How do they relate to the figures R51 397,68 and R42 338,46?

3.4 What is the total income? Explain which figures have been added to get this result.

3.5 Can you tell how many members belong to the club from this statement?

3.6 What is the given time period of this income statement?

3.7 If there are 70 full members of the club, calculate the annual subscription for full members (assume all members pay their fees!).

3.8 If there are 36 junior members of the club, calculate the monthly subscription for junior members.

3.9 Calculate the average monthly telephone cost for this time period.

3.10 Which of the sports club costs are fixed? Explain your answer.

3.11 Which costs are variable? Explain your answer.

3.12 There is an urgent need for further repairs, new chairs and more sports equipment. Can the club afford to meet any new expenses? Explain your answer.

3.13 Can you tell from the income statement whether the club owns its property?

3.14 What is the monthly repayment on the club's bank loan?

INCOME STATEMENT 2004 — SPORTS CLUB

INCOME

Subscriptions:	R51 397,68

Full members	R35 698,25
Junior members	R11 012,20
Family memberships	R4 687,23

Other income:	R42 338,46

Ticket sales	R12 898,56
Donations received	R23 459,90
Hire of facilities	R5 980,00

TOTAL INCOME	R93 736,14

EXPENSES

Interest on overdraft facility:	R12 000
Electricity:	R879,97
Cleaning materials:	R765,90
First Aid:	R768,00
Repairs and maintenance:	R4 589,21
Salaries and wages:	R45 560,09
Telephone:	R2 650,89
Water:	R1 970,65
TOTAL EXPENSES	**R69 184,71**
NET SURPLUS	**R24 551,43**

Activity 4 — Invoices and receipts

ABOUT THIS ACTIVITY

This activity consolidates ideas from previous activities and so is suitable for assessment purposes. Students organise financial information that has been presented in a variety of different ways, and display it on a table that shows the details of each transaction. They also identify income, expense, fixed and variable cost, and calculate surplus (deficit). Specific Outcomes and Assessment Criteria addressed are SO1: AC1, 2, 4; and SO2: AC1, 2, 3, 4 of Unit Standard 11241.

MANAGING THIS ACTIVITY

This activity needs very little management as all the terms and ideas have been introduced before. Students organise invoices, receipts and various records of the sports club mentioned in activity 3. They complete a given table, which requires that they identify dates, invoice numbers, expense items etc. They are also required to do some calculations.

Students should each receive a copy of handout 4 and worksheet 4.

4.1 No. The columns indicate what the money is used for, but not which amounts are income and which are expenses.

4.2 The expenses are telephone, electricity, bank loan and salaries (cleaning materials and plumber would usually be expenses, but nothing was spent on these here). The income items are donations, subscriptions, tickets and chair hire.

4.3 The telephone bill was paid on 2nd March and the amount paid was R278,98.

4.4 The entry number was 004.

4.5 No. The columns for cleaning materials and plumber are empty.

4.6 Yes. Although items are not separated into income and expenses, the words 'paid' and 'received' give a clear indication of what transaction has taken place.

4.7 Building materials were paid for by cheque (we see this indicated in the brackets -cheque 11) and the amount paid was R2 167,80.

4.8 Receipt 32 written on the 13th March, records that the club received a donation of R200 from T. Medupe. Invoice 35 is an account from the plumbers issued on the 4th March to the sports club for an amount of R406,98. Receipt 21 was issued on 5th March by Plumbing Services to the club showing that the club had paid an amount of R406,98. Cheque counterfoil 123 shows that the club paid Telkom R340,67 on the 5th February. Receipt 33 shows that the club received an amount of R509,98 from G. Smith.

4.9 Receipt 21 was not issued by L. Khan of the sports club, it was issued by Plumbing Services (to the sports club) and so was signed by their representative, J. Smith. Point out to students that receipts can be issued or received. The sports club issued receipts 32 and 33, but received receipt 21.

4.10 The amount R509,98 is the exact amount of a full membership fee, so Jacob can make a reasonably accurate deduction that this was a subscription.

4.11 This is a second telephone bill, but it is dated February 5th so this is last month's bill. Possibly it was not entered into the records for February. Alternatively, it was simply placed in the wrong pile.

4.12 Receipt 21 indicates that this bill was paid by the sports club to Plumbing Services. Point out to students that invoice 35 and receipt 21 both belong to the same event and that there should be a cheque counterfoil also, indicating that payment was made from the sports club's cheque book.

4.13 and 4.14

Revenue (income) in rands				Expenditure (expenses) in rands			
No.	Date	Item	Amount	No.	Date	Item	Amount
002	9/3	Subscrip.	987,45	001	2/3	Tel. Acc.	278,98
004	15/3	Chairs	320,00	003	15/3	Elec.Acc.	287,90
006	24/3	Donation	500,00	005	15/3	Bank	1000*
007	25/3	Tickets	980,68	008	26/3	Salary	3750*
5	26/3	Donation	250,00	9	26/3	Lawn	345,90
6	26/3	Subscrip.	2 039,92	10	27/3	Plumber	346,00
7	27/3	Tickets	254,00	11	27/3	Building	2 167,80
32	13/3	Donation	200,00	21	5/3	Plumber	406,98
33	30/3	Subscrip.	509,98	123	5/2	Tel. Acc.	340,67
		TOTAL REVENUE:	R6 042,03			TOTAL EXPENDITURE:	R8 924,23

4.15 The sports club ran at a deficit of R2 882,20 (R6 042,03 – R8 924,23 = –R2 882,20).

Activity 4 — Invoices and receipts

In activity 3, Jacob analysed the 2004 income statement for the local sports club. Now he has the March 2004 records and is trying to organise them into a single system. He notices that some figures have been recorded in a cash book and others in a daily records book. There are also loose receipts and invoices that have not been recorded anywhere yet. Use this information which is given on handout 4 to answer the following questions:

Refer to the cash book — March entries:

4.1 Does this method of recording financial transactions indicate which are income items and which are expenses?

4.2 List the items that you think are expenses and those that you think are income.

4.3 On what day was the telephone bill paid and how much was it?

4.4 What was the entry number of the chair hire transaction?

4.5 Were any cleaning materials bought between the 2nd and the 26th of March, according to this record?

Refer to the daily records book — March entries:

4.6 Does this method of recording financial transactions indicate which are income items and which are expenses? Explain your answer.

4.7 What method of payment was used to pay for building materials and how much was paid?

Refer to the loose receipts and papers:

4.8 Write a sentence explaining what transaction each of the five documents has recorded.

4.9 Study the three receipts. Given that L. Khan receives all monies on behalf the sports club, why do you think one of them was signed by someone else?

4.10 Consider receipt No. 33. We know that R509,98 was received from G. Smith, but we are not told what this payment is for. Can Jacob make an accurate deduction about what this money was received for (hint: use information from activity 3)?

4.11 Jacob is puzzled by cheque counterfoil No.123, as this seems to be a second telephone bill that was paid. The first telephone bill was recorded in the cash book. Can you explain what has happened?

4.12 Jacob wonders whether invoice no. 35 is an outstanding bill that still needs to be paid. Can you answer this question for him?

4.13 Use the table given below to record all the transactions that have been given on handout 4 (cash book, daily records book and loose documents).

Revenue (income) in rands				Expenditure (expenses) in rands			
No.	Date	Item	Amount	No.	Date	Item	Amount
TOTAL REVENUE:				TOTAL EXPENDITURE:			

4.14 Put an asterisk (*) next to any item that you think is a fixed cost.

4.15 Did the sports club run at a surplus or a deficit in the month of March? How much was this (consider the February telephone bill as one of the March expenses as it was not recorded in February)?

Plumbing Services INVOICE
65 Church Street, NO: 35
Parklands
Tel: (021) 321-6785 DATE: 4/3/04

To: The Sports Club
11th Avenue

For: Plumbing services and parts R357.00

14% VAT R49,98

TOTAL DUE: R406,98

RECEIPT 21

Date: 5 March 2004

Received from: The Sports Club

The sum of: Four hundred and six rand and 98c

For: Plumbing Services

Signed: J. Smith

No. 123

Date: 5 February 2004
To: Telkom
For: Telephone bill

	R	C
Previous bal.	5 430	90
Deposit	-	
This cheque	340	67
Balance	5 090	23

RECEIPT **No. 33**

Date: 30 March 2004

Received from: G. Smith

The sum of: Five hundred and nine rand and ninety-eight cents

For: .....

Signed: L. Kahn

Activity 5 — Buying and hiring

ABOUT THIS ACTIVITY

This activity involves the effect of costs relative to a transaction. Students prepare invoices and use documents that require them to calculate costs and also to offset costs against revenue. The context is the sports club again, and the transactions involve improvements to the facilities so that they can be hired out. The Specific Outcomes and Assessment Criteria addressed are SO1 - AC1, 3, 5; and SO2 - AC2, 4 of Unit Standard 11241.

MANAGING THIS ACTIVITY

Little management is required here. Remind students that to calculate the cost of a number of items, we multiply the number of items by the unit price. Discuss with students the idea that investing in an asset (improving, expanding, changing) can create new opportunities for generating income. It is important, however, to examine the figures carefully and check that the possible income generated is more than the cost of the improvement. It is also important to do a survey to make sure that the target market is in fact interested in buying the product. In this activity the improvement relates to the sports club and the target market is the local community who may be interested in hiring these upgraded facilities for various functions.

Students should each receive a copy of handout 5 and worksheet 5.

5.1 Calculate the cost as follows:

Tino's Table and Chair Outlet:		
5 tables @ R536,00		R2 680,00
130 chairs @ R75		R9 750,00
		R12 430,00
	VAT	R1 740,20
	TOTAL	R14 170,20
Cutlery and crockery		
150 large knives @ R8,75		R1 312,50
150 regular forks @ R8,00		R1 200,00
150 dessert spoons @ R6,50		R 975,00
150 plates @ R9,50		R1 425,00
150 tumblers @ R6,50		R 975,00
	TOTAL	R5 887,50
	COMBINED TOTAL:	**R20 057,70**

Note that VAT was only charged at Tino's, that only 5 tables were needed as we already had 10 and that only 130 chairs were needed as we already had 20.

5.2 2 serving spoons @ R7,20 = R14,40 × 15 tables = R216. A bread knife costs R8,50 × 15 tables = R127,50. Therefore an amount of R343,50 extra would be needed.

5.3 Yes. There would be R24 551,43 - R20 057,70 = R4 493,73 left over.

5.4 Yes. There is R4 493,73 which could be put towards buying a microphone.

5.5 The club makes a profit of R600 (R500 + R250 - R150 = R600).

5.6 The shortfall is R10 800,07 - R 4 493,73 = R6 306,34. Divide this amount by the profit per function to get: R6 306,34 ÷ R600 = 10,5. Therefore the club would need to have 11 functions to cover the shortfall and buy the microphone and sound system.

5.7 The completed invoice:

THE SPORTS CLUB			**INVOICE**
16 11th Avenue,			No: 22
Parklands.			
Tel: (021) 456-765			
			Date: 12th May
To: Ms F. Solomons			
2 School Lane,			
Parklands.			
For:	Hall hire	R500,00	
	Cutlery/Crockery	R250,00	
	Breakage	4 × R6,50	R26,00
		2× R9,50	R19,00
		2× R8,00	R16,00
		Total	R811,00
		Deposit	-R200,00
		TOTAL DUE:	**R611,00**

Note: This invoice could be written in different ways, provided the method of calculation is clear and the total due is the same.

Activity 5 — Buying and hiring

Jacob has spent some days studying the income statements, the monthly expenditure and the state of the facilities at the sports club. In planning for the year ahead he sees that a number of items need replacing and realises that he could use these improvements as a means to generate more income. The hall is big enough to seat 150 people and the club owns 10 tables that can seat 10 each. There are only 20 chairs in good condition, but Jacob thinks that if the club bought more chairs and tables, as well as crockery and cutlery enough for 150, there is a good chance that the hall could be hired out for evening functions requiring a sit-down meal. If there was sufficient demand, this would be a good source of additional income for the club. He also wants to investigate the possibility of buying a microphone, which would make it easier to hear in the hall. He knows that the club has a surplus of R24 551,43 from last year (as calculated in activity 3). Assume for the purposes of this activity that the whole of last year's surplus is money that can be spent.

Use the price lists given on handout 5 to answer the following questions:

5.1 Calculate the costs of buying sufficient rectangular 10-seater tables, standard single chairs, large knives, regular forks, dessert spoons, plates and tumblers to cater for 150.

5.2 How much extra would be needed to cover the costs of two serving spoons per table and a bread knife per table?

5.3 Will last year's surplus cover these expenses (the serving spoons and bread knives were not bought)? Show your calculation.

5.4 Would it still be worth investigating a microphone?

Jacob would like to hire the hall out at R500 for an evening function, with an additional charge of R250 for the hire of crockery and cutlery. He plans to charge a R200 refundable deposit, from which he will deduct the cost price of any breakage. The club will clean up after a function and this will cost the club R150 per function. The club is not a VAT vendor.

5.5 What profit does the club make on each function if crockery and cutlery are hired as well as the hall?

5.6 Jacob has priced a microphone and sound system at R10 800,07. If he uses the R4 493,73 that is left over from last year's surplus, how many functions would be needed to make up the shortfall and buy the system (assume that the hall is hired with cutlery and crockery and without breakage)?

5.7 Using the blank document given below, write out an invoice to Ms. F Solomon for the balance of her account given the following information: Ms F. Solomon paid a R200 deposit on 2nd May to secure a booking for the sports club hall for a function to be held on the 9th May. She asked for crockery, cutlery and tumblers as she wanted to serve a meal. All went well at the function, although 4 tumblers and 2 plates were broken. It also seems that 2 forks went missing. This is invoice number 22 and the date is 12th May 2005. Ms Solomons lives at 2 School Lane, Parklands.

THE SPORTS CLUB **INVOICE**
16 11th Avenue, No: .....
Parklands.
Tel: (021) 456-765

Date: .....

To: .....
.....
.....

For:

Total

Deposit

TOTAL DUE:

PRICE LISTS AND QUOTATIONS

Tino's Table and Chair Outlet

Table :	Round (4)	R250,00
	Round (8)	R420,00
	Rectangle (6)	R380,00
	Rectangle (10)	R536,00
Chairs:	Standard single	R75,00
	Deluxe single	R90,00
Bench:	Standard	R200,00
	Superior	R325,00
Patio:	Table and chair set (4)	R320,00
	Table and chair set (8)	R580,00

All prices are VAT exclusive.

Cutlery and Crockery Emporium

Table knives (large)	*R8,75*
Table knives (small)	*R7,99*
Bread knife	*R8,50*
Carving knife	*R12,00*
Table forks (regular)	*R8,00*
Table forks (fish)	*R6,75*
Dessert spoons	*R6,50*
Serving spoons	*R7,20*
Teaspoons	*R5,50*
Special Combo Unit	*R96,00*
(4 large knives, 4 small knives 4 reg. forks, 4 dessert spoons)	
Plates	*R9,50*
Tumblers	*R6,50*

Activity 6 — The soccer match

ABOUT THIS ACTIVITY

In this activity students calculate expenditure and revenue in the context of a soccer match. They identify costs relative to a possible transaction and compare these with available revenue. They work with different tariffs and calculate how these impact on income and expenditure. The Specific Outcomes and Assessment Criteria addressed are SO1 - AC1, 2, 5; and SO2 - AC1, 2, 4 of Unit Standard 11241.

MANAGING THIS ACTIVITY

Discuss with students some of the issues that should be considered when organising a local soccer match. Raise issues such as ticket price, costs of maintaining the field, who would be interested in watching and what spectators may buy while watching the game. Remind them that if we want to break even, our income must cover all the costs that are involved, and if we want to make a profit, our income must exceed our expected costs.

Students should each receive a copy of handout 6 and worksheet 6.

6.1 'Regular employee salaries' is a fixed cost that the club would have to pay regardless of whether there was a soccer match or not, so R6 506,00 can be subtracted from the estimated costs.

6.2 The types of costs that have been identified are: maintaining the field, maintaining the stands, ablution facilities, perimeter fence and gates, hotdog and cooldrink stalls, labour and invited guests.

6.3 Calculate by adding all costs, except the regular employee salaries. The total is R10 290,00.

6.4 750 could be accommodated in total: 700 sitting and 50 standing.

6.5 Ticket sales and a percentage of the income from the various stalls are the two major sources of income.

6.6

Hotdog and chips	600 @ R2,50	R1 500,00
Cooldrinks	1 000 @ R5,00	R5 000,00
Caps, vuvuzela	200 @ R16,50	R3 300,00
Ice-cream	200 @ R5,00	R1 000,00
	TOTAL:	R10 800,00

The income to the sports club is 10% of R10 800, which is R1 080.

6.7 A variety of answers would be expected here and all are acceptable provided they are backed up with a reason. Students may comment that 1000 cooldrinks is more that one per spectator.

6.8 The total estimated cost of hosting the match is R10 290 less the income from stalls of R1 080, leaving a total cost of R9 210. There are 750 tickets to be sold, so to break even divide the total cost by the number of tickets (R9 210 ÷ 750 = R12,28) to reach an amount of R12,28.

6.9 Increase the total cost of R9 210 by R4 500 to get R13 710. Divide this new total by 750 tickets to reach a price of R18,28 (R13 710 ÷ 750 = R18,28).

6.10 If 700 tickets are sold for Rx the total income is 700x (number of tickets × unit price). If 50 tickets are sold for R0,5x the total income is 50(0,5x) = 25x. Adding the two, we get 725x which must be equal to our total of R13 710 and we find the price by dividing R13 710 by 725 to get R18,91 for a seat and R9,46 for a standing ticket.

6.11 Yes. The seats are about R3 more and the standing room tickets are less, but we could say that Jacob has been successful in keeping prices much the same.

6.12 A variety of opinions would be expected, but in general this is a good price for a ticket. Students may comment that a 'round' figure would be easier to manage in terms of giving change (eg. R19 and R9,50).

Activity 6 — The soccer match

The sports club holds a few matches and competitions every year. Jacob needs to organise a soccer match and realises that it would be a good idea to estimate the expenses and income before deciding on a price for the tickets. He is interested in making a small profit, but realises that if the price of the tickets is high, the number of spectators will drop. He would like to keep the prices much the same as last year's price which was R15,50 per ticket.

Use the information given on handout 6 to answer the following questions:

6.1 Study the estimated costs of hosting a soccer match and identify a fixed cost that can be disregarded because it would be an expense the club would have to pay regardless of whether there was a soccer match or not.

6.2 Name the seven types of costs that have been identified.

6.3 Calculate the estimated cost of hosting the soccer match.

6.4 How many spectators could be accommodated for the match?

6.5 Name the two major sources of income.

6.6 Calculate the expected income from the various stalls and the amount that this would add to the income of the sports club.

6.7 Give your own opinion as to how accurate these estimates are. For example, do you think Jacob was right by estimating 1 000 cooldrinks would be sold, but only 200 ice-creams?

6.8 If all the tickets are sold at the same price, what would the price of a ticket need to be to cover all the estimated costs and break even (assume there were no empty places)?

6.9 Jacob would still like to get table-cloths and serving platters for the hall, costing R4 500. What would the ticket price need to be to make sufficient profit to cover this amount (assume that all tickets are sold at the same price)?

6.10 If all the tickets are sold, but the standing room tickets are sold at half-price, what would the price of a seat and a standing room ticket need to be, to cover the R4 500?

6.11 If Jacob decides on the prices calculated in 6.10, has he succeeded in keeping the tickets at approximately the same price as last year?

6.12 Give your own opinion about the prices chosen by Jacob. For example, would you buy one and think it was a fair price?

ESTIMATED COSTS OF HOSTING A SOCCER MATCH

Maintaining the field:
- Mowing
- Lime and brushes for marking
- Levelling etc R650,00

Maintaining the stands:
- Hire extra stand
- Repairs to existing stands
- Tools to be replaced
- Cleaning R1 940,00

Ablution facilities:
- Cleaning and materials
- Repairs R350,00

Perimeter fence and gates:
- Repairs R200,00

Hotdog and cooldrink stall:
- Repairs R150,00

Labour:
- Regular employee salaries R6 506,00
- Additional casual labourers' wages R3500,00
- Additional cleaners' wages R2000,00
- Ticket sales and collection (volunteers) R0

Invited guests:
- Tickets
- Snacks and beverages
- Gift T-shirt R1500,00

ESTIMATED SOURCES OF INCOME

Ticket Sales:
- 700 seats Price to be decided
- 50 standing room Price to be decided

10% of the takings from:
- Hotdog and chips stall 600 @ R2,50 each
- Cooldrink stall 1 000 @ R5,00 each
- Caps, vuvuzela stall 200 @ R16,50 each
- Ice-cream stall 200 @ R5,00 each

Activity 7 — Missing documents

ABOUT THIS ACTIVITY

In this activity students reconcile transactions with records and accounts. They identify items that are missing and begin the recovery process. They work with shortfalls and refunds, and are expected to perform calculations demonstrating an understanding of how these affect income. The context is balancing the finances after a soccer match. The Specific Outcomes and Assessment Criteria addressed are SO1 - AC3, 4, 5; and SO2 - AC1, 4, 5 of Unit Standard 11241.

MANAGING THIS ACTIVITY

Ask students for ideas as to how the 'money' could be handled on the day of a soccer match, remembering that hundreds of people are coming in at the gates, stalls are busy and many items are being bought for small amounts. Raise questions such as: Where should the money be kept? Who should keep it? How can an accurate record be kept? What happens when a stall runs out of change?

In this activity the money is controlled at a central venue, with stalls 'depositing' every hour and receipts being issued for these amounts. There is still a mixture of papers and information to organise and reconcile at the end of the day. Students should receive a copy of handout 7 and worksheet 7.

7.1 The date of the match was 3rd May as we can see from the dates on all the receipts other than those from early ticket sales.

7.2 H. Gutta signed all the receipts on behalf of the sports club, so we assume he was in charge of the money for the day.

7.3 A total of R4 028 was received from the community centre and each ticket sold was a seat priced at R19, so we calculate the number of tickets by dividing the total received by the price of one seat to get: R4 028 ÷ R19 = 212 tickets.

7.4 We first need to add up all the tickets sold: 42 + 8 = 50 standing room tickets were sold; 15 + 212 + 305 + 35 + 20 + 80 = 667 seats were sold. Therefore, all the standing room tickets were sold, but 33 seats were left over (700 - 667 = 33).

7.5 Income from standing room should be 50 × R9,50 = R475 and from seats should be 667 × R19 = R12 673. Adding these together the expected income from ticket sales is R13 148.

7.6 The expected income from each stall is as follows:

- Hotdogs: 456 × R2,50 = R1 140
- Cooldrinks: 1325 × R5,00 = R6 625
- Ice-cream: 321 × R5,00 = R1 605
- Caps and vuvuzelas: 58 × R16,50 = R957

Hence the total amount that should have been deposited from stalls is R10 327.

7.7 The completed table follows, with asterisks (*) indicating missing items. Students may set the table out in various ways, provided they identify the missing payments.

	Receipt No.	Amounts and actual totals		Expected total
Tickets: High school	36	R684		
Community centre	35	R4 028		
Sports club	47	R5 871		
Gate 1	41	R665		
Gate 2	*	*		*R380 missing
Gate 3	46	R1 520	**Total: R12 768**	**Total: 13 148**
Hotdogs:	37	R210,34		
	39	R186,20		
	50	R527,00		
	51	R216,46	**Total: R1 140**	**Total: 1 140**
Cooldrinks:	40	R600,24		
	42	R1 327,46		
	43	R1 107,91		* missing R2 000
	45	R210,25		
	52	R1 379,14	**Total: R 4 625**	**Total: 6 625**
Caps/vuvuzelas:	*	*		* missing R957 **Total: R957**
Ice-cream:	38	R132,46		
	44	R220,40		
	48	R327,46		
	49	R924,68	**Total: R1 605**	**Total: 1 605**

7.8 Three invoices should be made out numbered 1, 2 and 3 and dated 5th May. They should be made out as follows:

To: Gate 2	For: 20 seats @ R19	Total due: R380
To: Caps/Vuvuzelas	For: 58 items @ R16,50	Total due: R957
To: Cooldrink stall	For: Balance of account	Total due: R2 000

7.9 Each stall receives 90% of its earnings, so hotdogs receive 90% ×R1 140 = R1 026; ice-creams receive 90% × R1 605 = R1 444,50; cooldrinks receive 90% × R6 625 = R5 962,50; and caps/vuvuzelas receive 90% ×R957 = R861,30.

7.10 Calculate the total revenue received as follows: R13 148 (tickets) + R114 (10% from hotdogs) + R662,50 (10% from cooldrinks) + R95,70 (10% from caps/vuvuzelas) + R160,50 (10% from ice-cream) = R14 180,70 in total.

For interest, ask students to compare the actual figures from the soccer match with the estimates in activity 6 and notice that the estimated costs could easily be covered.

Activity 7 — Missing documents

After a successful soccer match, Jacob needs to organise the cash boxes, the receipts, the refunds and all the bits of information that have been received during the week and on the day of the match. He would like to check all the figures against the receipts that have been issued and make any payments or refunds that are still necessary. He knows that the club will only keep 10% of the earnings from the stalls, so each stall gets a refund (each stall should have deposited its total income on the day).

Carefully study the information and receipts given on handout 7 and answer the questions that follow:

7.1 What was the date of the soccer match?

7.2 Who was in charge of collecting money for the sports club and issuing the receipts?

7.3 How many tickets were sold at the community centre?

7.4 Were all the tickets sold for the match? If not, how many were left unsold?

7.5 What income is expected from ticket sales in total?

7.6 Calculate the total expected income of each stall and hence the total amount from stalls that should have been deposited and receipted by the end of the day.

7.7 When counting up the cash, Jacob finds a shortfall of R3 337,00 and decides to match the receipts to the expected income in order to find out where the problem is. Use the given table to identify who owes this money.

	Receipt No.	Amounts and actual totals	Expected total
Tickets: High school Community centre Sports club Gate 1 Gate 2 Gate 3		**Total:**	
Hotdogs:		**Total:**	
Cooldrinks:		**Total:**	
Caps/vuvuzelas:		**Total:**	
Ice-cream:		**Total:**	

7.8 Write out invoices to those who still owe money to the club from the match. Draw up your own invoices using the format of the invoice given below and start numbering invoices from 1. Use the date 5th May and charge total amounts due (before the club pays any refunds).

The Sports Club **INVOICE**
16 11th Avenue, **No**……
Parklands
Tel: (021) 456-765

Date: ……..

To:

For:

TOTAL DUE:

7.9 Calculate the amount that the club should refund each of the stalls, remembering that the club only keeps 10% of the earnings of the stalls.

7.10 Calculate the total revenue received by the sports club from the soccer match.

INFORMATION AND DOCUMENTS FROM THE SOCCER MATCH

Tickets

Tickets were sold at four different venues:

- the high school office
- the sports club office
- the community centre
- at the gates on the day of the match

Ticket prices were set at R19 for a seat and R9,50 for a standing room ticket to try and make it easier for ticket sellers to give change.

Control of incoming cash

Cash was controlled at a central point on the day of the match and receipts were issued by the sports club to all representatives who deposited sums of money. People manning the stalls and gates were encouraged to deposit every hour, so that large sums were not being stored in boxes or under counters.

Information received:

- The high school office sold almost all the standing room tickets - they sold 42 standing room tickets and only 15 seats.
- The community centre deposited R4 028 the day before the match and they sold only seats.
- 305 seats and the remaining 8 standing room tickets were sold at the sports club office.
- Gate 1 sold 35 seats, gate 2 sold 20 seats and gate 3 sold 80 seats.
- 456 hotdogs, 1325 cooldrinks, 321 ice-creams and 58 caps/vuvuzelas were sold.

Receipts issued:

Receipt **35** Date: 2 May Received from: Community centre The sum of: Four thousand and twenty-eight rand only. For: Tickets Signed: H. Gutta (Sports club)	**Receipt** **36** Date: 2 May Received from: The High School The sum of: Six hundred and eighty-four rand only. For: Tickets Signed H. Gutta (Sports club)	**Receipt** **37** Date: 3 May Received from: Lindi The sum of: Two hundred and ten rand and 34c. For: Hotdog sales Signed: H. Gutta (Sports club)
Receipt **38** Date: 3 May Received from: Andrew The sum of: One hundred and thirty-two rand and 46c. For: Ice-cream sales Signed: H. Gutta (Sports club)	**Receipt** **39** Date: 3 May Received from: Lindi The sum of: One hundred and eighty-six rand twenty cents. For: Hotdog sales Signed: H. Gutta (Sports club)	**Receipt** **40** Date: 3 May Received from: S. Solomon The sum of: Six hundred rand and twenty-four cents. For: Cooldrink sales Signed: H. Gutta (Sports club)

Receipt **41** Date: 3 May Received from: *Thami* The sum of: *Six hundred and sixty-five rand only.* For: *Tickets Gate 1* Signed: *H. Gutta* (Sports club)	**Receipt** **42** Date: 3 May Received from: *S. Solomon* The sum of: *One thousand three hundred and twenty-seven rand and forty-six cents.* For: *Cooldrink sales* Signed: *H. Gutta* (Sports club)	**Receipt** **43** Date: 3 May Received from: *S. Solomon* The sum of: *One thousand one hundred and seven rand 91c.* For: *Cooldrink sales* Signed: *H. Gutta* (Sports club)
Receipt **44** Date: 3 May Received from: *Andrew* The sum of: *Two hundred and twenty rand 40c.* For: *Ice-cream sales* Signed: *H. Gutta* (Sports club)	**Receipt** **45** Date: 3 May Received from: *S. Solomon* The sum of: *Two hundred and ten rand and twenty-five cents.* For: *Cooldrink sales* Signed: *H. Gutta* (Sports club)	**Receipt** **46** Date: 3 May Received from: *S. Khan* The sum of: *One thousand five hundred and twenty rand only* For: *Gate 3 Tickets* Signed: *H. Gutta* (Sports club)
Receipt **47** Date: 3 May Received from: *Jacob* The sum of: *Five thousand eight hundred and seventy-one rand.* For: *Club ticket sales* Signed: *H. Gutta* (Sports club)	**Receipt** **48** Date: 3 May Received from: *Andrew* The sum of: *Three hundred and twenty-seven rand 46c.* For: *Ice-cream sales* Signed: *H. Gutta* (Sports club)	**Receipt** **49** Date: 3 May Received from: *Andrew* The sum of: *Nine hundred and twenty-four rand and 68c.* For: *Ice-cream sales* Signed: *H. Gutta* (Sports club)
Receipt **50** Date: 3 May Received from: *Lindi* The sum of: *Five hundred and twenty-seven rand only.* For: *Hotdog sales* Signed: *H. Gutta* (Sports club)	**Receipt** **51** Date: 3 May Received from: *Lindi* The sum of: *Two hundred and sixteen rand and 46c.* For: *Hotdog sales* Signed: *H. Gutta* (Sports club)	**Receipt** **52** Date: 3 May Received from: *S. Solomon* The sum of: *One thousand three hundred and seventy-nine rand and fourteen cents.* For: *Cooldrink sales* Signed: *H. Gutta* (Sports club)

Activity 8 — Planning a function

ABOUT THIS ACTIVITY

In this activity students work with variable costs and make decisions based on the calculation of expenditure. They compare two different scenarios and adjust their calculations accordingly. They identify circumstances in which costs can be fixed or variable and demonstrate an understanding of the costs relative to different transactions. The Specific Outcomes and Assessment Criteria addressed are SO1 - AC1, 2; and SO2 - AC1, 2, 3 of Unit Standard 11241.

MANAGING THIS ACTIVITY

This activity requires very little management as all the ideas have been introduced in previous activities. It draws together the contexts of the sport club and the catering firm "Delicious Dishes" in an activity where students calculate the costs of catering for a function in the sports club hall and compare this with the prices offered at a restaurant. All necessary information has been reprinted in handout 8, so this is a self-contained activity suitable for evaluation purposes.

Students should each receive a copy of handout 8 and worksheet 8.

8.1 Calculate the cost by multiplying the cost of one meal by the number of people, and adding 10% to the total, reaching an amount of R4 620 (R35 × 120 = R4 200, add R420 to get R4 620). The cost of beverages would not be included in this. She can afford this option only if her guests buy their own drinks. If not, this option would exceed her budget of R4 800.

8.2 The cost of meal option B is R60 × 120 = R7 200, plus 10% (R720), giving a total of R7 920. This whole cost is fixed. Once again, the cost of beverages is not included (this would be a variable cost). She cannot afford this option as she only has R4 800 to spend.

8.3 The completed table is given below:

Items	**Costs**	**Totals**
Sports club		
Hire hall	R500	R500,00
Hire cutlery and crockery	R250	R250,00
Deposit	R200 (refundable, so not included)	
Delicious Dishes		
Lamb breyani	5 large @ R90	R450,00
Vegetable lasagne	5 large @ R90	R450,00
Beef curry	5 large @ R96	R480,00
Delivery and heating	10% × R1 380	R138,00
Salads	12 × R36	R432,00
Beverages	120 × R13	R1 560,00
Ice-cream	120 × R2,50	R300,00
Chocolate sauce	120 × R1,20	R144,00
Invitations	120 × R0,50	R60,00
Postage	R20	R20,00
Music	-	0
Serving	-	0
Cleaning	-	0
Total		**R4 784,00**

8.4 The price per head is R4 784,00 ÷ 120 = R39,87. The fixed costs are the hire of the hall and the hire of cutlery and crockery. The cost of the various dishes is fixed, but the catering is a variable cost as different choices could be made. Ayesha can just afford this option, with R16 left over.

8.5 A variety of responses would be expected here, although the sports club is clearly the best option as beverages are included in the total cost. Students should mention some of the following:

- Guests would have to pay for beverages at the restaurant (if Ayesha paid she would exceed her budget).
- No dessert was offered in meal option A at the restaurant, while ice-cream and chocolate sauce would be served at the sports club.
- Guests would not be able to dance at the restaurant.
- Both venues have cleaning afterwards included in the price.
- Ayesha would need to do less work if the restaurant was chosen.
- The restaurant might not play the music that Ayesha wanted.

Activity 8 — Planning a function

Ayesha wants to arrange a large family celebration and needs to decide whether she should hold the function at the 'Corner Restaurant' or at the local sports club hall. Both venues are close to her home and each offers a different possibility for a function. She realises that the restaurant would require much less work on her part, but she is quite prepared to cook or make salads if necessary. She will ultimately make the decision based on what she can afford. She has saved R4 800 for the function and wants to do something as nice as possible. She would like to invite 100 guests plus 20 family members. Use the information, prices and notes given on handout 8 to answer the following:

8.1 Calculate the cost of holding the function at the 'Corner Restaurant' if Ayesha chose meal option A (remember to add the service charge). What costs would not be included in this? Can she afford this option?

8.2 Calculate the cost of holding the function at the restaurant with meal option B. What costs are fixed? Can she afford this option?

8.3 Use the table below to help you calculate the cost of holding the function at the sports club:

Items	**Costs**	**Totals**
Sports club Hire hall Hire cutlery and crockery Deposit		
Delicious Dishes Lamb breyani Vegetable lasagne Beef curry Delivery and heating		
Salads		
Beverages		
Ice-cream Chocolate sauce		
Invitations Postage		
Music		
Serving		
Cleaning		
Total		

8.4 What is the price per head if Ayesha chooses the sports club? Which of the costs are fixed and which are variable? Can she afford this option?

8.5 Which is the best option? Write a paragraph explaining your choice.

PRICES AND INFORMATION COLLECTED

Delicious Dishes — Menu and Price List			
	Small — serves 1	Medium — serves 4	Large — serves 8
Bobotie	R15	R49	R98
Lasagne (with beef)	R14	R50	R105
Lasagne (vegetarian)	R12,50	R45	R90
Beef curry	R14,50	R48	R96
Lamb curry	R14,50	R48	R96
Breyani (chicken)	R12,50	R42	R85
Breyani (lamb)	R13	R45	R90
Butternut casserole	R12	R40	R80
Note: "Delicious Dishes" can deliver hot meals half an hour before a function for a 10% charge.			

The sports club prices

Hire of hall:	R500
Hire of cutlery/crockery	R250
Deposit (refundable)	R200

Corner Restaurant

Quotation:

Meal A (main course only)	R35 per person
Meal B (includes coffee and sweets)	R60 per person
Beverages	Sold separately at the function
Venue hire	Included in meal price
Music	Restaurant's choice
Service charge	10% of the cost of the function
Space	Seats 80 with dance floor or 120 without dance floor

An extract from Ayesha's notebook:

Notes and ideas for the big bash!

If we use the sports club option we need to:

- *Hire the hall*
- *Hire cutlery and crockery*
- *Pay deposit - will be refunded*
- *Contact "Delicious Dishes" and order 5 large lamb breyani, 5 large vegetable lasagne and 5 large beef curry to be delivered hot*
- *Make own salads - allow R36 for a salad serving 10*
- *Order beverages - allow R13 per person*
- *Order ice-cream - allow R2,50 per person*
- *Make chocolate sauce for ice-cream - allow R1,20 per person*
- *Photocopy 120 invitations on attractive thin cardboard-allow 50c each and R20 to cover those that need posting*
- *Organise music - ask family to bring CD's and borrow speakers from next door - no charge*
- *Serve the meal - ask friends to help - no charge*
- *Clean up afterwards - included in the hall hire - hooray!*

Activity 9 — Matching records

ABOUT THIS ACTIVITY
In this activity students compare transaction amounts recorded in a company's books with source documents. They reconcile individual transactions with statements, fill in outstanding amounts, complete receipts and counterfoils and allocate items to the correct accounts. The company is once again the sports club, and students examine the monthly statements. The Specific Outcomes and Assessment Criteria addressed are SO1 - AC1, 2, 4, 5; and SO2 - AC1, 4, 5 of Unit Standard 11241.

MANAGING THIS ACTIVITY
Little management is required here. Students are expected to study a set of receipts and cheque counterfoils, which they match to two statements. Various documents are missing and some statements have not been entered. Students fill in the missing items and hence complete and correct the monthly records of the sports club.

Students should receive copies of handout 9 and worksheet 9.

9.1 In general we expect that the receipts should match the income and the cheque counterfoils should match the expenses.

9.2 The missing line item is receipt number 033 which should be filled in as follows:

No.	Date	Hall hire	Donations	Subscription	Crockery hire	Ticket sale	Matches	10% from stalls			Totals
033	30			R506							

9.3 The completed receipts follow (choose any names):

RECEIPT **023** Date: *15 July* Received from: *Lindi* The sum of: *Two hundred and fifty rand only.* For: *Crockery Hire* Signed: *H. Gutta* (Sports club)	**RECEIPT** **024** Date: *15 July* Received from: *Thandi* The sum of: *Seven hundred and fifty rand only.* For: *Hall and crockery hire* Signed: *H. Gutta* (Sports club)	**RECEIPT** **025** Date: *15 July* Received from: *John* The sum of: *Eight hundred and seventy-six rand only.* For: *Matches* Signed: *H. Gutta* (Sports club)
RECEIPT **026** Date: *26 July* Received from: *Andrew* The sum of: *Four hundred and fifty rand only.* For: *Donation* Signed: *H. Gutta* (Sports club)	**RECEIPT** **027** Date: *27 July* Received from: *Ahmed* The sum of: *Nine hundred and eighty rand and sixty-eight cents.* For: *Ticket sales* Signed: *H. Gutta* (Sports club)	

9.4 The missing line item is counterfoil no. 62 which should be filled in as follows:

No.	Date	Telephone	Equipment	Cutlery and crockery	Electricity	Sound system	Bank loan	Cleaning and repairs	Plumber	Salaries	Totals
62	30								R340		

9.5 The fixed costs are the bank loan and the salaries. Although telephone, electricity and others are regular monthly expenses, they vary in amount depending on consumption and are therefore not fixed.

9.6 The completed counterfoils follow (be flexible about names chosen):

No. 56
Date: 15 July
To: The City Council
For: Telephone bill

	R/c
Previous bal.	R4 714
Deposit	-
This cheque	R299
Balance	R4 415

No. 58
Date: 15 July
To: Bank
For: Bank loan

	R/c
Previous bal.	R3 948
Deposit	-
This cheque	R1 000
Balance	R2 948

No. 60
Date: 27 July
To: Sound shop
For: Sound system

	R/c
Previous bal.	R1 968
Deposit	-
This cheque	R786
Balance	R1 182

No. 61
Date: 27 July
To: Staff
For: Salaries

	R/c
Previous bal.	R1 182
Deposit	-
This cheque	R3 750
Balance	-R2 568

9.7 This means that R200 was deposited since the last balance of R5 193, so the new starting balance is actually R5 393. If we subtract R679 from this we arrive at R4 714.

9.8 The previous balance on counterfoil no. 62 is -R2 568 and the closing balance is R92 (after adding R3 000 and subtracting R340).

9.9 The cheque account balance is R92 as counterfoil 62 was the last amount recorded.

9.10 Calculate the cash income for July by adding all income items (including the R506 from the missing line item 033) to get an amount of R5 768,68. Calculate expenses by adding all expense items (including the missing amount of R340 paid to the plumber) to get an amount of R8 588.

Activity 9 — Matching records

On handout 9 you have been given incomplete statements of the cash income and the cheque expenses for the sports club for the month of July. You have also been given an incomplete record of the receipts issued, and the cheque counterfoils collected, for July. Study these carefully and use them to answer the following questions:

9.1 Choose the correct words to complete the following sentence. In general we expect that the receipts should match the …(income or expenses) and the cheque counterfoils should match the …(income or expenses).

9.2 By studying the given documents, identify the missing line item in the cash income statement and fill it in on the table.

9.3 Complete the missing receipts using the information given on the income table (choose any names for the clients).

9.4 Identify the missing line item on the expenses statement and fill it in on the table.

9.5 Which of the expenses are fixed costs?

9.6 Complete the incomplete cheque counterfoils using the information given on the expenses table.

9.7 Explain what the R200 means on counterfoil 55 and show how the balance of R4 714 was calculated.

9.8 Fill in the previous balance and the balance on counterfoil No. 62.

9.9 What was the balance in the cheque account at the end of July?
Calculate the total cash income and the expenses for July.

STATEMENTS AND DOCUMENTS FOR THE MONTH OF JULY

CASH INCOME

No.	Date	Hall hire	Donations	Subscription	Crockery hire	Ticket sale	Matches	10% from stalls			Totals
021	2	R500									
022	12			R987							
023	15				R250						
024	15	R500			R250						
025	15						R876				
026	26		R450								
027	27					980,68					
028	30		R120					R87			
029	30							R262			

EXPENSES (CHEQUE ACCOUNT)

No.	Date	Telephone	Equipment	Cutlery and crockery	Electricity	Sound system	Bank loan	Cleaning and repairs	Plumber	Salaries	Totals
54	6	R287									
55	9			R679							
56	15				R299						
57	15							R467			
58	15						R1000				
59	24		R980								
60	27					R786					
61	29									R3750	

RECEIPTS

RECEIPT **021** Date: *15 July* Received from: *H. Hendriks* The sum of: *Five hundred rand only.* For: *Hire of the hall* Signed: *H. Gutta* (Sports club)	**RECEIPT** **028** Date: *30 July* Received from: *S. Smith* The sum of: *Two hundred and seven rand only.* For: *Donation and stalls* Signed: *H. Gutta* (Sports club)	**RECEIPT** **033** Date: *30 July* Received from: *T. Nguka* The sum of: *Five hundred and six rand.* For: *Subscriptions* Signed: *H. Gutta* (Sports club)
RECEIPT **022** Date: *12 July* Received from: *K. Humann* The sum of: *Nine hundred and eighty-seven rand only.* For: *Subscriptions* Signed: *H. Gutta* (Sports club)	**RECEIPT** **029** Date: *30 July* Received from: *Andrew* The sum of: *Two hundred and sixty two rand.* For: *Stalls* Signed: *H. Gutta* (Sports club)	**RECEIPT** Date:..... Received from: The sum of: For: Signed: *H. Gutta* (Sports club)
RECEIPT Date:..... Received from: The sum of: For: Signed: *H. Gutta* (Sports club)	**RECEIPT** Date:..... Received from: The sum of: For: Signed: *H. Gutta* (Sports club)	**RECEIPT** Date:..... Received from: The sum of: For: Signed: *H. Gutta* (Sports club)
RECEIPT Date:..... Received from: The sum of: For: Signed: *H. Gutta* (Sports club)	**RECEIPT** Date:..... Received from: The sum of: For: Signed: *H. Gutta* (Sports club)	**RECEIPT** Date:..... Received from: The sum of: For: Signed: *H. Gutta* (Sports club)

CHEQUE COUNTERFOILS

No. 59
Date: 24 July
To: F. Renza
For: Equipment (hall)

	R/c
Previous bal.	R2 948
Deposit	-
This cheque	R980
Balance	R1 968

No. 54
Date: 6 July
To: The Postmaster
For: Telephone

	R/c
Previous bal.	R5 480
Deposit	-
This cheque	R287
Balance	R5 193

No.55
Date: 9 July
To: Crockery Emporium
For: Crockery and cutlery

	R/c
Previous bal.	R5 193
Deposit	R200
This cheque	R679
Balance	R4 714

No. 57
Date: 15 July
To: Cleaning services
For: Cleaning and repairs

	R/c
Previous bal.	R4 415
Deposit	-
This cheque	R467
Balance	R3 948

No. 62
Date: 30 July
To: Plumber
For: Plumbing services

	R/c
Previous bal.	?
Deposit	R3 000
This cheque	R 340
Balance	?

No.
Date:
To:
For:

	R/c
Previous bal.	
Deposit	
This cheque	
Balance	

No.
Date:
To:
For:

	R/c
Previous bal.	
Deposit	
This cheque	
Balance	

No.
Date:
To:
For:

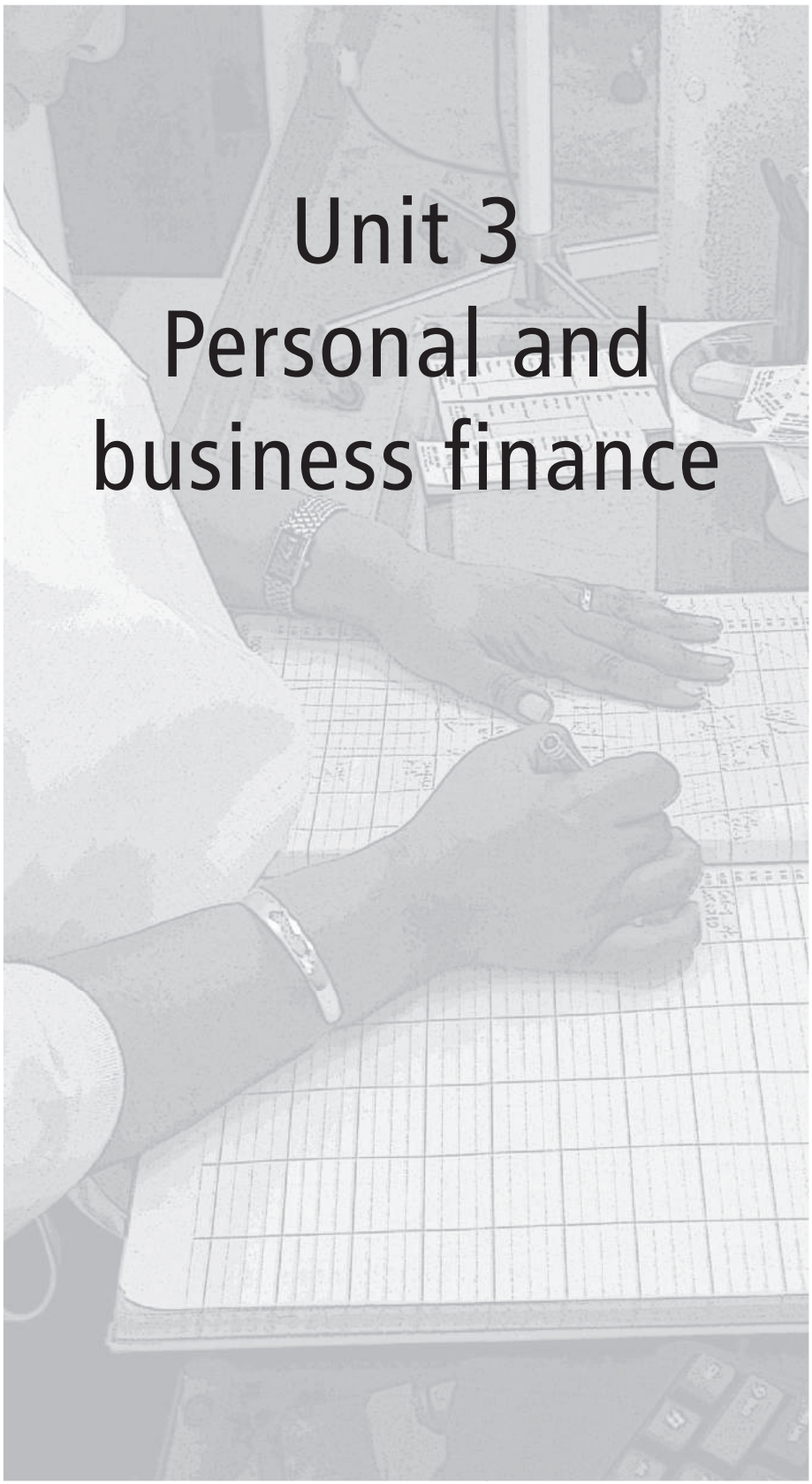
	R/c
Previous bal.	
Deposit	
This cheque	
Balance	

No.
Date:
To:
For:

	R/c
Previous bal.	
Deposit	
This cheque	
Balance	

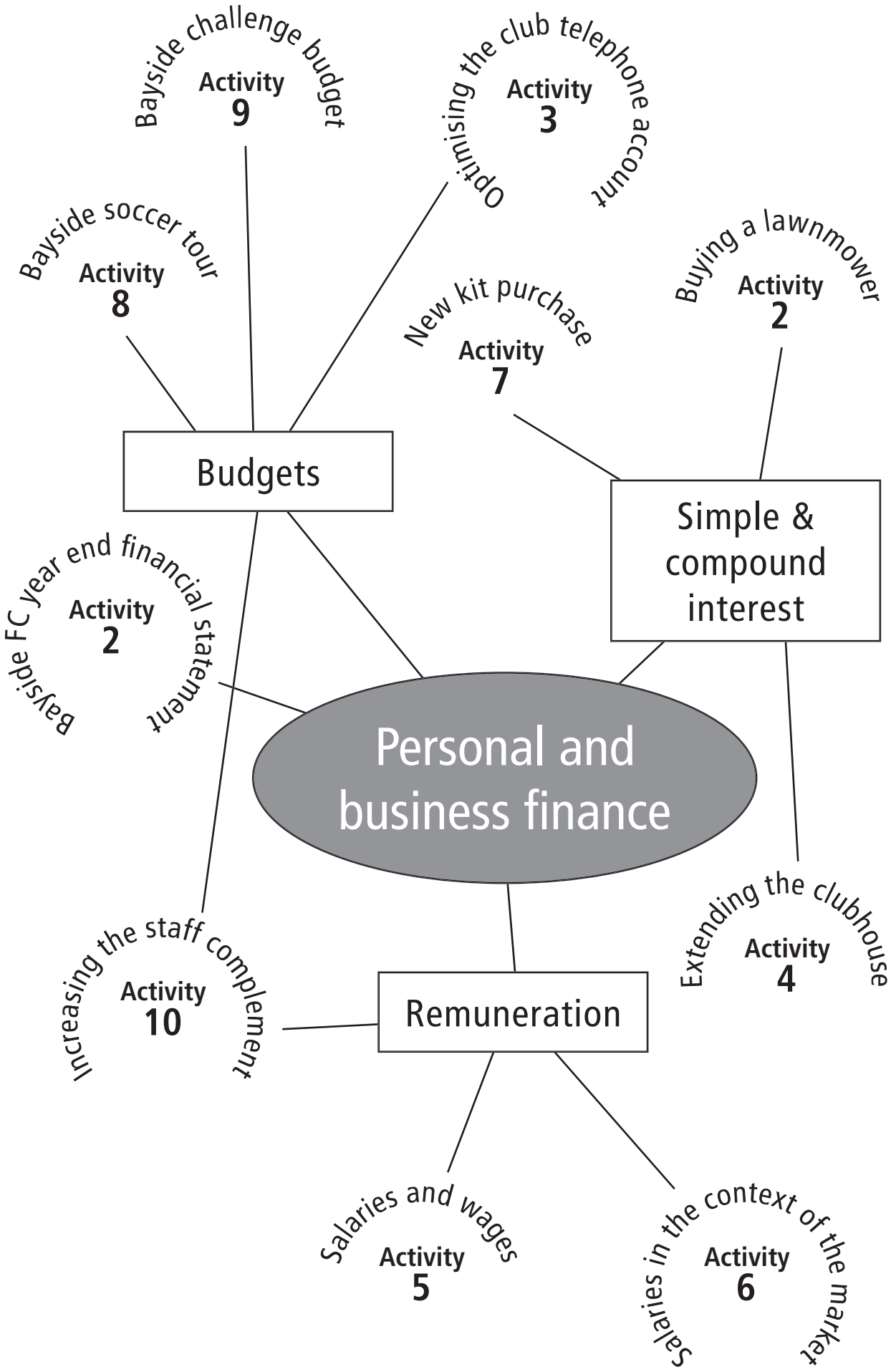
Mathematical Literacy

NQF LEVEL 3



Unit 3
Personal and business finance

Generic Business Administration


Bayside challenge budget
Activity 9
Optimising the club telephone account
Activity 3
Bayside soccer tour
Activity 8
New kit purchase
Activity 7
Buying a lawnmower
Activity 2
Budgets
Simple & compound interest
Bayside FC year end financial statement
Activity 2
Personal and business finance
Extending the clubhouse
Activity 4
Increasing the staff complement
Activity 10
Remuneration
Salaries and wages
Activity 5
Salaries in the context of the market
Activity 6

Overview

This unit deals with the mathematics associated with financial management in a small business.

The aim of this unit is to increase students' familiarity with and understanding of mathematics in a small business context by equipping them with mathematical vocabulary and skills to help them. Students should learn to use mathematics, understand mathematics and voice an opinion using mathematics in a business context.

The unit consists of ten activities in which aspects of business finance are explored in the context of a soccer club. Each activity is a stand-alone activity, but the thematic thread runs throughout. Topics such as income and expenditure statements, budgets, remuneration, inflation, hire purchase and interest are addressed. The activities require simple calculations, understanding, analysis and the application of knowledge.

Activity 1: The Bayside Soccer Club year-end financial summary
In this activity students are introduced to a financial summary. First the terminology and layout of the summary are explored. Then income and expenditure are analysed and compared with figures of the previous year. The students are asked to make recommendations to increase profitability. Finally the students are asked to suggest appropriate budgeting for the next financial year. Students need to be familiar with calculations involving percentage.

Activity 2: Buying a lawnmower
In this activity the students examine the financing options for buying a lawnmower for the club. A study and comparison of buying on hire-purchase versus taking out a bank loan is made. The ideas of simple and compound interest are introduced.

Activity 3: Optimizing the club telephone account
In this activity the students familiarise themselves with telephone accounts and tariffs so that they can make recommendations to optimize expenditure on calls. With the use of tables and formulas, the students critically examine options and formulate a policy based on their findings.

Activity 4: Extending the clubhouse
In this activity students explore options in taking out a building loan. An understanding of compound interest is developed. The students critically evaluate repayment options for a bond, by exploring the effects of changing the term, interest and repayment amounts. Finally students get an opportunity to use what they have learned to draw up their own spreadsheet.

Activity 5: Salaries and wages
In this activity the students look at and compare options involving pay package. They are required to perform

Unit outcomes

The following Unit Standards, Specific Outcomes and Assessment Criteria are addressed by this unit:

Use mathematics to investigate and monitor the financial aspects of personal and business issues (9011).

- Use mathematics to investigate and interpret business budgets with respect to income and expenditure (SO1).
  - Financial Statements are interpreted in order to describe profits and losses realistically.
  - Calculations are carried out using computational tools efficiently and correctly and solutions are verified in terms of the context.
  - Percentages and ratio are used effectively to compare planned budgets to end of financial year statements.
  - Analyses of budgets and financial statements are presented in different ways that makes for easy monitoring and control.
- Use simple and compound interest to make sense of and define a variety of situations (SO2).
  - Methods of calculation are appropriate to the problem types.
  - The effect of compound interest quoted as effective or nominal is described in terms of rates of change, different functional representations and common applications.
  - Computational Tools are used efficiently and correctly and solutions obtained are verified in terms of the context or problem.
  - Solutions to calculations are used effectively to define the changes over a period of time.
- Use mathematics to debate aspects of remuneration in the workplace (SO3)
  - Values are calculated correctly.
  - Mathematical calculations are used to compare, interpret and describe aspects of remuneration.
  - Debating points are well based on well-reasoned arguments and are supported by mathematical information.

calculations involving ratio and percentage and to interpret graphs and tables. At the end of the activity the students use what they have learnt to analyse and debate aspects of remuneration.

Activity 6: Salaries in the context of the market
In this activity the students develop their understanding of pay package and explore options in remuneration. The students learn to compare the salary of an employee with the market and make informed predictions following the market pattern.

Activity 7: New kit purchase
This activity looks at the costs involved in the purchase of a new kit for a soccer team. The students perform calculations involving mark up, discounts and foreign exchange and finally critically analyse the budget.

Activity 8: Bayside soccer tour
In this activity the students prepare a cost analysis for a soccer team tour to a foreign country. The activity involves the reading, analysis and comparison of information from a variety of sources, including tables and graphs. Calculations involving substitution into formulas and percentage are performed.

Activity 9: The Bayside challenge budget
In this activity students prepare a budget sheet for a fund raising activity. Income and expenditure are analysed and compared with figures from the previous year. The students are asked to make recommendations to increase profitability and to suggest appropriate budgeting for the next financial year.

Activity 10: Increasing the staff complement
This activity looks at the decisions that need to be made by management regarding affordability, equity and market relatedness, when a business wishes to increase its staff complement. In this activity the students compare actual and budgeted costs and then extrapolate to budget for future growth.

9011	**Use mathematics to investigate and monitor the financial aspects of personal and business issues**											
		ACTIVITY	1	2	3	4	5	6	7	8	9	10
SO1	Use mathematics to investigate and interpret business budgets with respect to income and expenditure.											
	AC1	Financial statements are interpreted in order to describe profits and losses realistically.	✓						✓		✓	
	AC2	Calculations are carried out using computational tools effectively and correctly and solutions obtained are verified in terms of the context.	✓		✓				✓	✓	✓	✓
	AC3	Percentages and ratio are used effectively to compare planned budgets to end-of-year financial statements	✓						✓	✓	✓	✓
	AC4	Analyses of budgets and financial statements are presented in different ways that make for easy monitoring and control.	✓		✓				✓	✓	✓	✓
SO2	Use simple and compound interest to make sense of and define a variety of situations.											
	AC1	Methods of calculation are appropriate to the problem types.		✓		✓			✓			
	AC2	The effect of compound interest quoted as effective or nominal is described in terms of rate of change, different functional representations and common applications.		✓		✓			✓			
	AC3	Computational tools are used efficiently and correctly and solutions obtained are verified in terms of the context or problem.		✓		✓			✓			
	AC4	Solutions to calculations are used effectively to define the changes over a period of time.		✓		✓			✓			
	AC5	Formulae to calculate solutions to problems are appropriate and used with understanding.		✓					✓			
SO3	Use mathematics to debate aspects of remuneration in the work place.											
	AC1	Values are calculated correctly.					✓	✓				✓
	AC2	Mathematical calculations are used to compare, interpret and describe aspects of remuneration.					✓	✓				✓
	AC3	Debating points are based on well-reasoned arguments and are supported by mathematical information.					✓	✓				✓

Activity 1 — The Bayside Soccer Club Year End Financial Summary

ABOUT THIS ACTIVITY

In this activity students are introduced to a financial summary. First the terminology and layout of the summary are explored. Then income and expenditure are analysed and compared with figures of the previous year. The students are asked to make recommendations to increase profitability. Finally the students are asked to suggest appropriate budgeting for the next financial year. Students need to be familiar with calculations involving percentage.
This activity is aligned with unit standard 9011 and addresses AC 1, 2 , 3 and 4 of SO1.

MANAGING THIS ACTIVITY

1.1 Monies received from any source = income
Funds used = expenditure
Unused funds = surplus
Shortfall of funds = deficit

1.2 The inclusion of the figures for the year ending in May 2000 is made so that the members can compare the current financial activities of the club with prior activities. This gives them a better understanding of how the club is doing e.g. it is growing, it is overspending, it is in financial trouble etc.

1.3 Yes. The word "overall" leads us to the summary of income and expenditure. Here it can be seen that in both years the income exceeded the expenditure and therefore a profit was made in both years.

1.4 % increase = (2001 income – 2000 income) ÷ 2000 income × 100

$$= \frac{(173221{,}64 - 133831{,}11)}{133831{,}11} \times 100$$

= 29% (rounded to the nearest %)

1.5 % increase = (2001 expenditure – 2000 expenditure) ÷ 2000 expenditure × 100

$$= \frac{150362{,}18 - 118747{,}05)}{118747{,}05} \times 100$$

= 27% (rounded to the nearest %)

1.6 Yes. The income (which was already greater than the expenditure) has increased by a bigger % than the expenditure.

1.7 The greatest surplus is in the Other category (R36 717,23).
The greatest deficit is in the Club Running category (-R22 000,53).

1.8 Largest expenditure is Wages (R75 352,00).
Largest income is Subscriptions (R95 908.28).

1.9 Significant additional income comes from:
- Sponsorship
- Bar sales
- Hall hire

1.10 The answers here could cover a wide range. Use a class discussion to compare suggestions and rank them in order of effectiveness. Suggestions may include the following :
- The club could hold more events like the Bayside Challenge that attract sponsorship.
- Increasing the number of events could also boost bar sales and could be used as an opportunity to increase income from catering.

- The club could develop the hiring of the hall as an income producer by advertising more widely or giving special offers for special customers or days.
- Annual subscriptions could be increased.

Areas mentioned here could be any expenditure from the Club Running Expenses e.g. the electricity or telephone. Discussion on the pros and cons of reducing costs in areas such as wages, insurance, security could follow.

Activity 1 —

The Bayside Soccer Club Year End Financial Summary

At the Bayside Soccer Club Annual General Meeting the treasurer, Anthea November, presents the summary for the financial year 1/6/2000 to 31/5/2001. The financial summary is presented to the club members to inform them of the financial status of their club. A copy of the summary is attached to the back of this activity.

Examine the summary and answer the questions that follow.

1.1 To understand the summary you need to know the meaning of the terms that are used. Find words in the summary that mean each of the following:

- Monies received from any source
- Funds used
- Unused funds
- Shortfall of funds

1.2 If the summary is for the financial year ending in May 2001, why do you think that the figures for the year ending in May 2000 are also shown?

1.3 Was the club profitable overall in 2000 and 2001? Give a reason for your answer.

1.4 Calculate the % increase in total income from 2000 to 2001.

1.5 Calculate the % increase in total expenditure from 2000 to 2001.

1.6 Do your answers in 1.4 and 1.5 support your answer in 1.3. Explain.

1.7 The summary is divided into three categories — *Club Running*, *Sponsorship* and *Other*. In 2001, which of the categories yielded:

- the greatest surplus?
- the greatest deficit?

1.8 Identify for 2001:

- the largest expenditure under *Club Running Expenses* .
- the largest income amount under Income From *Members*.

1.9 It is clear that membership subscriptions (fees) do not bring in sufficient funds to cover the club expenses and the club has other significant ways of acquiring funds. Identify three other large income producers.

1.10 The club wants to increase its savings for future development. Identify three areas in the summary where the club could consider increasing its income to become more profitable.

1.11 Identify an area in the summary where the club could consider reducing expenditure to become more profitable.

BAYSIDE SOCCER CLUB
FINANCIAL SUMMARY FOR THE YEAR 1/6/2000 TO 31/5/2001

	MAY 2001	MAY 2000
SUMMARY		
INCOME	R 173221.64	R 133831.11
EXPENDITURE	R 150362.18	R 118747.05
NET MOVEMENT IN BANK ACCOUNT	R 22859.46	R 15084.06

ANALYSIS OF INCOME/EXPENDITURE

1. CLUB RUNNING

INCOME FROM MEMBERS	**R 126040.28**	**R 88860.50**
Subscriptions	R 95908.28	R 63037.50
Match Entry Fees	R 8400.00	R 8100.00
Takings from Car Park	R 16157.00	R 13100.00
SAF Levy	R 5025.00	R 3275.00
Donation	R 550.00	R 1348.00
CLUB RUNNING EXPENSES	**R 148040.81**	**R 116394.52**
Wages	R 75352.00	R 65523.48
Electricity	R 6372.91	R 7931.68
Water/Rent (SPM)	R 972.95	R 913.37
Gas	R 4474.50	R 5153.00
Petrol	R 2019.73	R 1325.39
Telephone	R 3783.09	R 3480.12
Security	R 1850.64	R 1948.73
Postage	R 428.30	R 772.10
Printing & stationery	R 486.84	R 338.40
E Mail Sub	R 1618.00	R 1473.00
Insurance	R 2326.55	R 2339.68
Sas Levy	R 5025.00	R 3275.00
Trophies & badges	R 936.42	R 380.35
St John's Ambulance donation	R 600.00	
House and grounds	R 11148.37	R 9638.65
*roof sheeting/repairs	R 22605.52	
*lawn mower	R 805.94	
* new fireplace	R 3150.00	
**side door		R 1200.00
**roof repairs		R 4059.76
**roller	R 1944.31	R 861.00
**flags		R 1195.75
** outside bench	R 500.00	R 1580.00
Mnet rental		R 358.00
Functions	R 1639.74	R 2647.06
NET SHORTFALL	**-R 22000.53**	**-R 27534.02**

2. SPONSORSHIP

NET INCOME FROM SPONSORSHIP	**R 8142.76**	**R 12824.37**
Bayside Challenge	R 8142.76	R 12824.37

3. OTHER

OTHER INCOME	**R 39038.60**	**R 32146.24**
Bar (net profit)	R 17295.52	R 13961.09
Catering	R 1315.00	
Sale of balls		R 1179.20
Sale of kit		R 2000.00
Sale of tog bags		R 30.00
Hall Hire	R 16005.00	R 11963.30
Interest	R 4423.08	R 3012.65
OTHER EXPENDITURE	**R 2321.37**	**R 2352.53**
Liquor licence	R 250.00	R 250.00
Bank Charges	R 2071.37	R 2102.53
NET SURPLUS/DEFICIT	**R 36717.23**	**R 29793.71**

BANK ACCOUNT - CURRENT	**R 23952.18**
BANK ACCOUNT - INVESTMENT	**R 43000.00**
STOCK ON HAND	**R 13444.30**

Activity 2 — Buying a Lawnmower

ABOUT THIS ACTIVITY

In this activity the students examine the financing options for buying a lawnmower for the club. A study and comparison of buying on hire-purchase versus taking out a bank loan is made. The ideas of simple and compound interest are introduced.

This activity is aligned with unit standard 9011 and addresses AC 1, 2, 3, 4 and 5 of SO2.

MANAGING THIS ACTIVITY

2.1 Deposit = R19 750,00 × 20%
= R3 950,00

2.2 *Actual total payment = deposit + number of months cash price*

Number of months	6	12	18	24
Total payment	R20 777,00	R21 604,16	R22 656,50	R23 436,32

2.3 *Interest = total payment - cash price*

Number of months	6	12	18	24
Total payment	R20 777,00	R21 604,16	R22 656,50	R23 436,32
Cash price	R19 750,00	R19 750,00	R19 750,00	R19 750,00
Interest	R1 027,00	R1 854,16	R2 906,50	R3 686,32

2.4 *% interest = (interest ÷ cash price) × 100*

Number of months	6	12	18	24
%	5,2	9,4	14,7	18,7

2.5 Answers should be discussed. The student could cover any of the following:

	6 months	24 months
Advantages:	• pay less overall • pay off more quickly – this leaves funds for other uses	• lower installments • leaves funds available for other uses
Disadvantages	• higher installments	• paying more overall

2.6 The bank does not require a deposit, therefore the full amount is divided into installments.
The bank charges a higher interest rate.
(Some students may, point out that compound interest, by its nature, causes higher growth.)

2.7 *Actual payment = installment × number of installments*

6 months	12 months	18 months	24 months
R20 646,48	R21 227,76	R21 808, 98	R22 397,52

2.8 A = 16 772,32 – 3 441,08
= 64 331,24

B = 10 043,90 + 123,61
= 10 167,51

C $= 3\,378{,}56 \times \frac{17}{12}$
= 47,86

2.9 Payments are made in rands and cents and therefore values have been rounded off to the nearest cent. For this reason the last payment caters for the difference created by the rounding to bring the final balance to 0.

2.10 This is a topic for discussion. Students should be made aware that the costs involved are driven by the % interest that is charged. Each case requires investigation if a valid comparison is to be made. Answers in this example could include the following:

Bank loan		Hire purchase	
Advantages	Disadvantages	Advantages	Disadvantages
• No deposit required • The interest payable decreases after each payment	• Higher repayments • Higher total cost	• No need to arrange finance with the bank first before purchase • Lower total cost	• Deposit (you have to pay 20% of the price up front)

Activity 2 — Buying a Lawnmower

The Bayside Soccer Club needs a new lawnmower. *Masterlawn* sells the one they want, a Turfking 3000, for a cash price of R19 750,00.

Masterlawn can also sell the lawnmower on hire purchase. This means that interest is added to the cash price and then the club is required to pay a deposit of 20% of the original cash price up front and sign an agreement to pay off the balance in installments over a period of time.

2.1 How much is the deposit?

There is a choice of four repayment periods. The table below shows the monthly repayment amounts after the 20% has been paid.

6 months	12 months	18 months	24 months
R2 804,50	R1 471,18	R1 039,25	R811,93

2.2 For each of the different repayment periods, calculate how much the club actually pays *Masterlawn* for the lawnmower.

2.3 In each case *Masterlawn* has added a percentage to the cash price. This is called interest. How many rands of the total cost of each payment option is interest?

2.4 Calculate the interest rate for each repayment period as a percentage by using the formula below:

((total cost – cash price) ÷ cash price) × 100

2.5 Discuss the advantages and disadvantages of paying over 6 months or 24 months.

Anthea November, the club treasurer, also looks into the possibility of borrowing the total amount from the bank. This would mean that the club could pay the cash price in full to *Masterlawn* and sign an agreement with the bank to pay off the loan in installments over a period of time. The bank does not require a deposit. The table below shows the monthly repayment amounts to the bank.

6 months	12 months	18 months	24 months
R3 441,08	R1 768,98	R1 211,61	R933,23

2.6 What do you think are possible reasons for the repayments to the bank being higher than the repayments to the shop?

2.7 For each of the different repayment periods, calculate how much the club actually pays the bank.

Masterlawn added a single interest amount which differed for each payment period. This is called simple interest. The bank charges the same interest (17% a year) for all the time periods but the interest is calculated and added on each month. This is called compound interest.

2.8 The table below shows how the total cost is calculated for the 6 month bank loan using compound interest. Study the table, then calculate and write down the missing values labelled A, B and C.

	Interest on outstanding balance	Outstanding total	Payment	Remaining balance
Start of loan period	0.00	19750.00	0.00	19750.00
End of first month	279.79	20029.79	3441.08	16588.71
End of second month	183.61	16772.32	3441.08	A
End of third month	153.75	13484.98	3441.08	10043.90
End of fourth month	123.61	B	3441.08	6726.44
End of fifth month	93.20	6819.64	3441.08	3378.56
End of sixth month	C	3441.07	3441.07	0.00
		Total paid to bank	20646.47	

Interest rate = 17% per annum.
But interest is calculated monthly so

Monthly interest rate = $\frac{17}{12}\%$

End of first month = $19\,750 \times \left[\frac{17}{12}\right]\% = 279{,}79$

2.9 Why do you think the last repayment was different?

2.10 List the advantages and disadvantages of each of the two ways of financing the purchase.

Activity 3 — Optimizing the Club Telephone Account

ABOUT THIS ACTIVITY

In this activity the students familiarise themselves with telephone accounts and tariffs so that they can make recommendations to optimize expenditure on calls. With the use of tables and formulas, the students critically examine options and formulate a policy based on their findings.

This activity is aligned with unit standard 9011 and addresses AC 1 and 4 of SO1.

MANAGING THIS ACTIVITY

3.1 a) 7am-7pm weekdays = Standard Time
7pm-7am weekdays, Fri 7pm–Mon 7am = Callmore Time

b) Minimum charges are:
- 48,4 cents for local calls
- 86,8 cents for long distance calls

3.2 Draw the students' attention to the different units (seconds and minutes, rands and cents, etc.) and the need to convert from one to the other when calculating.

A 2 mins 24 secs = (2 × 60) + 24 seconds
= 144 seconds
cost = rate × duration of call
cost = (0,63 × 144) cents
= 90,72 cents
= R0,91 (rounded to the nearest cent)

B 5 mins 32 secs = (5 × 60) + 32 seconds
= 332 seconds
cost = rate × duration of call
cost = (0,83 × 332) cents
= 275,56 cents
= R2,76 (rounded to the nearest cent)

C 10 mins 3 secs = (10 × 60) + 3 seconds
= 603 seconds
cost = rate × duration of call
cost = (0,25 × 603) cents
= 150,75 cents
= R1,51 (rounded to the nearest cent)

D cost = rate × duration of call
cost = (0,63 × 54) cents
= 34,02 cents
but the minimum charge is 48,4 cents
∴ cost = 48,4 cents

3.3 A **cost = rate for 1st 60 secs + 2nd rate × (duration of rest of call ÷ 30)**

$$\text{cost} = 1{,}84 + 0{,}92 \times \frac{90 - 60}{30}$$

= R2, 76

B 2 mins 53 secs $= (2 \times 60 + 53)$ seconds

$= 173$ seconds

cost = rate for 1st 60 secs + 2nd rate × (duration of rest of call ÷ 30)

cost $= 1{,}84 + 0{,}92 \times \dfrac{173 - 60}{30}$

$=$ R5,31 (rounded to the nearest cent)

C 3 mins 45 secs $= (3 \times 60 + 45)$ seconds

$= 225$ seconds

cost = rate for 1st 60 secs + 2nd rate × (duration of rest of call ÷ 30)

cost $= 1{,}17 + 0{,}59 \times \dfrac{225 - 60}{30}$

$=$ R4,42 (rounded to the nearest cent)

3.4 Cost of cellular call $= 1{,}90 + 0{,}95 \times \dfrac{93 - 60}{30}$

$= 2{,}945$

$=$ R2,95

Cost of land line call $= (0{,}63 \times 93)$ cents

$= 58{,}59$ cents

$= 59$ cents

Difference $=$ R2,36

3.5 Total number of calls $= 213 + 1 + 12 + 10 + 101$

$= 337$

% cellular calls $= \dfrac{101}{337} \times 100$

$= 30\%$ (rounded to the nearest %)

% cost $= \dfrac{245{,}68}{665{,}69} \times 100$

$= 37\%$ (rounded to the nearest %)

Calls to cellular phones are charged at a much higher rate than landline calls therefore the average cost per call is higher (R2,43 per call as compared with an average of R1,30 per call for a landline call) .

3.6 348 mins $= 348 \times 60$ seconds

$= 20880$ seconds

cost $= 20880 \times 0{,}63$ cents

$= 13154{,}4$ cents

$=$ R131,54

R131,54 would be spent on calls.

But the *XtraTime 400* local service costs R105,26 + VAT

$\therefore$ saving $=$ R131,54 – (R105,26 + 14%)

$=$ R12,28

3.7 The *XtraTime 400 local* package would benefit the club if they typically made more than 400 minutes of local calls in Standard Time. Since the 348 minutes used is less than the 400 free minutes allowed, we know that all the local call costs charged for in this account must be for calls made in CallmoreTime. *XtraTime 400 local* is not, therefore, a package that will make a significant reduction to an account with this profile.

3.8 This is an open question that needs to touch on all the information that has been examined. Discussion could cover some of the following aspects:

- The best saver would be to cut down on the number of calls made in general.

- There is little room for saving where calls are part of club business e.g.
  - international calls
  - long distance calls
- From the calculations above we can determine that R145,36 is spent on local calls during Callmore Time. This may indicate that a large number of personal calls are being made after hours. However, it must also to be noted that a club, by its nature, runs the bulk of its activities after hours and this may therefore be an area in which the number of calls cannot be reduced.
- Calls made to cellular phones are more expensive than calls to land lines. Club phone users should be encouraged to:
  - call cellular phones only where necessary.
  - use landlines where possible.
- The *Xtratime 400 local* package does not make a significant saving for the club.

Activity 3 — Optimizing the Club Telephone Account

It is minuted at a meeting that the Bayside Soccer Club committee is concerned about the rising telephone account. They ask that the treasurer, Anthea November, should look into it. Anthea visits the Telkom office and gets the Telkom tariffs and the club phone account. Answer the following questions and help to optimize the account.

Use the handouts headed:
- An Extract from the Telkom Tariffs
- Telephone Account Extract

3.1 One of the tables on the Telkom Tariff sheet shows the call rates for calls made to destinations within South Africa. These calls are charged at different rates depending on the:
- distance;
- time of day; and
- day of the week.

All landline calls have a minimum charge.

(a) What are the different times of day on which charges are based? What does Telkom call these times?

(b) What are the minimum charges for calls made to places within South Africa?

3.2 The cost of a call is calculated in the following way:

Cost = rate × duration of call*

* If the answer to the calculation above works out at less than the minimum charge, then the minimum charge will apply.

Examples:

A local call made on a Tuesday at 22:03:21 lasting 53 seconds would be calculated as follows:

Cost = 2,25 × 53 = 13,25 cents, but 13,25 < 48,4 ∴ cost is 48,4 cents

Tuesday at 22h00 is during Callmore Time *Minimum charge*

Use the tariffs on the handout to calculate the costs of the following calls:

Note:
- Time of day is given in hours, minutes and seconds and using the 24 hour convention.

Call	Type	Day	Time (hh:mm:ss)	Duration (mm:ss)
A	Local	Monday	08:30:00	02:24
B	Long distance	Saturday	09:15:20	05:32
C	Local	Tuesday	20:46:15	10:03
D	Local	Friday	12:20:00	00:54

3.3 The second table gives the tariffs for making calls to cellular phones.

Calls to cellular phones are calculated at two rates: one rate for the first minute and another for the rest of the call per 30 seconds or part thereof. Calculate the cost of the following calls to cellular phones:

Call	Destination	Time (hh:mm:ss)	Day	Duration (mm:ss)
A	MTN	08:30:00	Friday	0:90
B	Cell C	11:09:15	Wednesday	2:53
C	Vodacom	21:40:15	Friday	3:45

3.4 If Anthea were to make a 93 second call to a cellular phone at 11am on a Tuesday, how much more would it cost the club than an identical call to a landline number?

Now consider the Bayside Soccer Club telephone account. Refer to the handout Telephone Account Extract

3.5 What percentage of the total number of calls is to cellular phones? How does this differ from the percentage of the total cost attributed to calls to cellular phones? What is the reason for this difference?

3.6 Telkom offers a package called *XtraTime 400 local* that allows for 400 free minutes of local calls on Standard Time per month for R105,26 excluding VAT. Thereafter calls are charged at the normal rate.

If local calls on Standard Time make up 348 minutes of the local calls charge on the account, how many rands could the club save if it went onto *XtraTime 400 local*?

3.7 Do you think it is worthwhile for the club to sign up for the *XtraTime 400 local* package as a way of cutting costs?

3.8 Use the information that you have gained from this activity to suggest a reasonable club telephone usage policy for calls made from club phones, if the aim is to reduce the amount spent. Consider areas such as:

- Type of call
- Number of calls
- Times at which calls are made
- *XtraTime 400 local*
- Personal calls

An Extract from the Telkom Tariffs

Note: All call rates include VAT

CALL RATES (National)

	STANDARD TIME Cents per second	CALLMORE TIME Cents per second	MINIMUM CHARGE Cents
Local (including 0860 calls)	0.63	0.25	48.4
Long Distance (including 0861 calls)	1.65	0.83	86.8

Callmore Time:	7pm-7am weekdays. Fri 7pm–Mon 7am
Standard Time:	7am-7pm weekdays.

CELLULAR PHONES

		RATE GROUP 1	RATE GROUP 2
		Peak Time: 7am – 8pm weekdays	Off - Peak Time: 8pm – 7am weekdays & Fri 8pm – 7am Mon
Vodacom	1st 60 seconds	R1.90	R1.17
	30 sec	R0.95	R0.59
MTN & Cell C	1st 60 seconds	R1.84	R1.13
	30 sec	R0.92	R0.56

Telephone Account Extract

Usage		
Call Type	No of calls	Cost
Access: Basic telephony services Calls from service no 021 788 3467 **XtraTime 400 local; 348 free minutes used**		
Local	213	R276.90
Long Distance	1	R17.77
International	12	R109.37
Special service / numbers	10	R5.97
Mobile	101	R245.68
Subtotal		**R655.69**
Total (usage)		**R655.69**

Activity 4 — Extending the Clubhouse

ABOUT THIS ACTIVITY

In this activity students explore options in taking out a building loan. An understanding of compound interest is developed. The students critically evaluate repayment options for a bond, by exploring the effects of changing the term, interest and repayment amounts. Finally students get an opportunity to use what they have learned to draw up their own spreadsheet.

This activity is aligned with unit standard 9011 and addresses AC 1, 2 , 3 and 4 of SO2.

MANAGING THIS ACTIVITY

4.1 VAT (valued added tax) at 14% is added. Students can be helped to understand that it is efficient to calculate 114% of the total rather than calculate 14% and then add it to the principal amount:

$$\text{VAT inclusive cost per m}^2 = 2000 \times \frac{114}{100}$$
$$= \text{R}2\,280{,}00$$
$$\text{Total cost} = 2280 \times 83$$
$$= \text{R}189240{,}00$$

4.2
$$\text{Permissible annual repayment} = 230\,840 \times \frac{30}{100}$$
$$= \text{R}69\,252{,}00$$
$$\text{Permissible monthly repayment} = \frac{69252}{12}$$
$$= \text{R}5\,771{,}00$$

4.3
$$\text{Principal value} = \text{R}189\,240{,}00$$
$$\text{Term} = 2 \text{ years}$$
$$\text{Final amount} = \text{R}211\,681{,}62$$
$$\text{Repayment amount} = \text{R}8\,820{,}07$$

4.4 The principal value remains the same.
The term has doubled to 4 years.
The repayment amount has dropped to R4 891,01.

4.5
$$\text{Interest in month no. 6} = \text{R}153\,157{,}69 \times \frac{11}{12}\,\%$$
$$= \text{R}1403{,}95 \text{ (rounded to the nearest cent)}$$

$$\text{Interest in month no. 20} = \text{R}42\,913{,}05 \times \frac{11}{12}\,\%$$
$$= \text{R}393{,}37 \text{ (rounded to the nearest cent)}$$

4.6 The factor driving the change here is the term — in Option 1 the term is 2 years and in Option 2 the term is 4 years. The change in term causes the total interest, the total payments and the monthly repayment to change.

4.7 A change in the principal amount to be loaned, or a change in the interest rate, would cause a change in the repayments.

4.8 The max allowable repayment to the bank is R5 771,00.
The repayments in option 1 are R8820,07
$\therefore$ the club cannot afford option 1.

4.9 Students may legitimately argue in favour of either statement, therefore their reasons are important.

Students who chose A may use arguments such as:

- If the club chooses a term that requires a repayment at the top of the bank's allowance then they will save on the interest they pay (note option 2 accrues R45 528,32 in interest whereas option 1 only accrues R22 441,62).
- The loan with the shorter term and higher repayments leaves the club debt free earlier.

Students who chose B may use an argument such as:

- The club understands that it will pay more interest but prefers to pay the lower installments. In this way the club is still able to borrow the money required and by saving on the installments can apply the savings to other needs that the club has each month.

4.10 Students' spreadsheets should show the following:

- The loan is paid up in full in July 2007 — which is a time period 8 months shorter than the period in option 2.
- The total payment made is R226 113,61 — which is R8 654,71 less than in option 2.
- The total interest paid is R36 873,61 — which is R8 654,71 less than in option 2.

Activity 4 — Extending the Clubhouse

The Bayside Soccer Club decides to improve their facilities. They have plans drawn up by an architect and get a building contractor to quote for the job.

4.1 If the contractor quotes a rate of R2 000,00 a square metre excluding VAT, and the architect's plans reflect that the extensions will add a further 83 m^2 to the club house, how much will the extensions cost?

Decisions need to be made regarding a bank loan to cover the extension costs. According to the particular bank's regulations, a company may contribute a maximum of 30% of their gross (i.e. before deductions) monthly income towards loan repayments.

4.2 The club had a gross annual income of R230 840 in 2003. Based on this and the Bank's regulations, calculate the maximum monthly amount that the Bayside Soccer Club can contribute towards a loan repayment.

The treasurer of Bayside Soccer Club, Anthea November, draws up some spreadsheets to show the committee (see handouts). The calculations show the principal value of the loan (i.e. how much they are borrowing), the term (i.e. the length of time given to repay the loan), the final amount that will have been paid by the end of the term (i.e. the loan value + interest) and the monthly repayments required.

4.3 What are the principal amount, term, final amount and monthly installments shown in the spreadsheet "Clubhouse extensions – Option 1"?

4.4 Compare your answers from option 1 with the equivalent answers in option 2. What has changed?

The bank charges interest of 11% per annum (i.e. for a year) but it is calculated monthly (i.e. at $\frac{11}{12}$ % per month). For example:

$$\text{Interest in month no 1} = \text{R}189\,240 \times \frac{11}{12}\,\% = \text{R } 1\,734{,}70$$

Each month the interest is added to the total owed and the next interest is calculated on the new total. Interest calculated in this way is called compound interest.

4.5 On the option 1 spreadsheet the interest calculations for month 6 and month 20 are omitted. Calculate the missing amounts (show all your working).

4.6 Each month the club will need to make a repayment to the bank. The repayment is calculated to ensure that the loan plus all the interest is repaid in full within the agreed term. In option 1 and option 2 the repayment amounts are different. Which factor changes the repayment amount?

4.7 Name two other factors that could change the repayment amount.

4.8 According to the particular bank's regulations (refer back to 4.2), can the club afford option 1?

4.9 From what you have learned so far, which of the following would you say is good advice to the club committee – give clear reasons for your choice:

A Make the highest possible repayments that you can afford, so that the loan is paid off as quickly as possible.

B Choose a long term so that repayments are low.

4.10 Develop your own spreadsheet to compare what happens when you choose to pay the maximum permissible monthly repayment. Work with the same principal value, interest rate and term as option 2, but change the repayments to R5 711,00.

Clubhouse Extensions — Option 1

% annually	**11**	Interest Rate (monthly)	0.0092
Term in Years	**2**	Term (in months)	24.00
Loan Amount	**189,240.00**	Principal Value	189,240.00

	Months Elapsed	Interest Portion	Capital Portion	Total Payment	Balance
Mar-2004					189240.00
Apr-2004	1	1734.70	7085.37	8820.07	182154.63
May-2004	2	1669.75	7150.32	8820.07	175004.32
Jun-2004	3	1604.21	7215.86	8820.07	167788.46
Jul-2004	4	1538.06	7282.01	8820.07	160506.45
Aug-2004	5	1471.31	7348.76	8820.07	153157.69
Sep-2004	6		7416.12	8820.07	145741.57
Oct-2004	7	1335.96	7484.10	8820.07	138257.47
Nov-2004	8	1267.36	7552.71	8820.07	130704.76
Dec-2004	9	1198.13	7621.94	8820.07	123082.82
Jan-2005	10	1128.26	7691.81	8820.07	115391.01
Feb-2005	11	1057.75	7762.32	8820.07	107628.69
Mar-2005	12	986.60	7833.47	8820.07	99795.22
Apr-2005	13	914.79	7905.28	8820.07	91889.95
May-2005	14	842.32	7977.74	8820.07	83912.20
Jun-2005	15	769.20	8050.87	8820.07	75861.33
Jul-2005	16	695.40	8124.67	8820.07	67736.66
Aug-2005	17	620.92	8199.15	8820.07	59537.51
Sep-2005	18	545.76	8274.31	8820.07	51263.20
Oct-2005	19	469.91	8350.15	8820.07	42913.05
Nov-2005	20		8426.70	8820.07	34486.35
Dec-2005	21	316.12	8503.94	8820.07	25982.41
Jan-2006	22	238.17	8581.90	8820.07	17400.51
Feb-2006	23	159.50	8660.56	8820.07	8739.95
Mar-2006	24	80.12	8739.95	8820.07	0.00
		Total Interest	**22,441.62**		
			Total Capital	**189,240.00**	
				Total Payments	**211,681.62**

Clubhouse Extensions — Option 2

% anually	11	Interest Rate (monthly)	0.0092
Term in Years	4	Term (in months)	48.00
Loan Amount	189,240.00	Principal Value	189,240.00

	Months Elapsed	Interest Portion	Capital Portion	Total Payment	Balance
Mar-2004					189240.00
Apr-2004	1	1734.70	3156.31	4891.01	186083.69
May-2004	2	1705.77	3185.24	4891.01	182898.45
Jun-2004	3	1676.57	3214.44	4891.01	179684.02
Jul-2004	4	1647.10	3243.90	4891.01	176440.11
Aug-2004	5	1617.37	3273.64	4891.01	173166.47
Sep-2004	6	1587.36	3303.65	4891.01	169862.83
Oct-2004	7	1557.08	3333.93	4891.01	166528.90
Nov-2004	8	1526.51	3364.49	4891.01	163164.40
Dec-2004	9	1495.67	3395.33	4891.01	159769.07
Jan-2005	10	1464.55	3426.46	4891.01	156342.61
Feb-2005	11	1433.14	3457.87	4891.01	152884.75
Mar-2005	12	1401.44	3489.56	4891.01	149395.18
Apr-2005	13	1369.46	3521.55	4891.01	145873.63
May-2005	14	1337.17	3553.83	4891.01	142319.80
Jun-2005	15	1304.60	3586.41	4891.01	138733.39
Jul-2005	16	1271.72	3619.28	4891.01	135114.11
Aug-2005	17	1238.55	3652.46	4891.01	131461.65
Sep-2005	18	1205.07	3685.94	4891.01	127775.71
Oct-2005	19	1171.28	3719.73	4891.01	124055.98
Nov-2005	20	1137.18	3753.83	4891.01	120302.15
Dec-2005	21	1102.77	3788.24	4891.01	116513.91
Jan-2006	22	1068.04	3822.96	4891.01	112690.95
Feb-2006	23	1033.00	3858.01	4891.01	108832.95
Mar-2006	24	997.64	3893.37	4891.01	104939.57
Apr-2006	25	961.95	3929.06	4891.01	101010.51
May-2006	26	925.93	3965.08	4891.01	97045.44
Jun-2006	27	889.58	4001.42	4891.01	93044.01
Jul-2006	28	852.90	4038.10	4891.01	89005.91
Aug-2006	29	815.89	4075.12	4891.01	84930.79
Sep-2006	30	778.53	4112.47	4891.01	80818.32
Oct-2006	31	740.83	4150.17	4891.01	76668.14
Nov-2006	32	702.79	4188.22	4891.01	72479.93
Dec-2006	33	664.40	4226.61	4891.01	68253.32
Jan-2007	34	625.66	4265.35	4891.01	63987.97
Feb-2007	35	586.56	4304.45	4891.01	59683.52
Mar-2007	36	547.10	4343.91	4891.01	55339.61
Apr-2007	37	507.28	4383.73	4891.01	50955.89
May-2007	38	467.10	4423.91	4891.01	46531.97
Jun-2007	39	426.54	4464.46	4891.01	42067.51
Jul-2007	40	385.62	4505.39	4891.01	37562.12
Aug-2007	41	344.32	4546.69	4891.01	33015.44
Sep-2007	42	302.64	4588.37	4891.01	28427.07
Oct-2007	43	260.58	4630.43	4891.01	23796.64
Nov-2007	44	218.14	4672.87	4891.01	19123.77
Dec-2007	45	175.30	4715.71	4891.01	14408.07
Jan-2008	46	132.07	4758.93	4891.01	9649.14
Feb-2008	47	88.45	4802.56	4891.01	4846.58
Mar-2008	48	44.43	4846.58	4891.01	0.00
	Total Interest	45,528.32			
		Total Capital	189,240.00		
			Total Payments	234,768.32	

Activity 5 — Salaries and Wages

ABOUT THIS ACTIVITY

In this activity the students look at compare options involving pay package. They are required to perform calculations involving ratio and percentage and to interpret graphs and tables. At the end of the activity the students use what they have learnt to analyse and debate aspects of remuneration.

This activity is aligned with unit standard 9011 and addresses AC 1, 2, and 3 of SO3.

MANAGING THIS ACTIVITY

5.1

Overtime rate = 30 × 15
= R45

Sundays/Holidays rate = 30 × 2
= R60

Week's earnings = (40 × 30) + (5 × 45) + (5 × 60)
= R1 725

5.2 Soccer season

Earnings per week = (40 × 30) + (3 × 45) + (3 × 60)
= R1515,00

Earnings per month = R1515 × 4
= R6060,00

Earnings for soccer season = R6060 × 6
= R36 360,00

Off-season

Earnings per week = 32 × 30
= R960,00

Earnings per month = R960 × 4
= R3 840

Earnings for off-season = R3 840 × 6
= R23 040,00

Average annual income = R36 360 + R23 040,00
= R59 400,00

5.3

Net income = R59 400 – (R59 400 × (18 +1)%)
= R48 114,00

5.4

Earnings for soccer season = 40 × R30 × 4 × 6
= R28 800,00

Earnings for off-season = R23 040,00

Average Annual Income = R28 800 + R23 040,00
= R51 840,00

Ahmed's average annual income decreases by R7 560,00 without overtime.

5.5

Tax = R49 178,49 × 18%
= R8 852,13 (rounded to the nearest cent)

Pension = R49 178,49 × 8%
= R3 934,28 (rounded to the nearest cent)

UIF = R49 178,49 × 1%
= R491,78 (rounded to the nearest cent)

Net income = R49 178,49 × 73%
= R35 900,30 (rounded to the nearest cent)
Check = R8 852,13 + R3 934,28 + R491,78 + R35 900,30
= R49 178,49

5.6 Joshua's monthly income available for medical aid $= \frac{\text{R35 900,30}}{12} - 2500$
= R491,69

Cost of *Premier* = R686 + R626 + (R220 × 2)
= R1 752,00
Joshua's share = R1 752 × 40%
= R700,80
∴ *Premier* is too expensive.

Cost of *Maxi* = R430 + R355 + (R199 × 2)
= R1 183,00
Joshua's share = R1 183 × 40%
= R473,20
∴ *Maxi* is the best affordable cover for Joshua.

5.7 This question could be handled as a class discussion. Points may include some of the following reasons:
- A salaried worker has more security. His earnings are regular and guaranteed while he is employed. An hourly paid worker may not earn if he is unable to work.
- Joshua's salary includes benefits (e.g. pension and, potentially, medical aid).

Activity 5 — Salaries and Wages in the Context of the Market

The Bayside Soccer Club employs only two full-time staff. They are Joshua, who supervises the day-to-day running of the clubhouse and Ahmed, who takes care of the grounds. Joshua is a salaried employee but Ahmed is paid by the hour. Club members do all other work on a voluntary basis.

Ahmed works a minimum of 30 hours a week. For up to 40 hours a week he is paid a rate of R30 an hour. Hours worked, on days other than Sundays and public holidays, in excess of 40 hours are considered overtime and are paid at 1½ times the standard hourly rate. Sundays and public holidays are paid at double the standard rate.

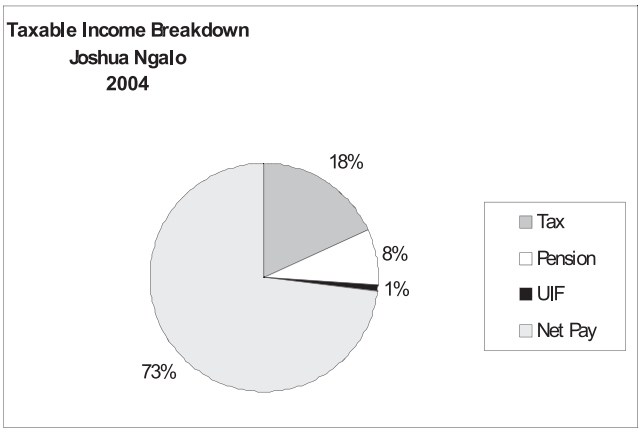
5.1 If Ahmed works for 45 hours on weekdays and 5 hours on Sunday in a busy week in season, how much will he earn that week?

5.2 On average, Ahmed works 43 hours a week (week days only) and 3 hours on a Sunday in the soccer season (April to September at Bayside) and 32 hours a week in the off-season (October to March). What is his average annual income (work with 4 weeks = 1 month)?

5.3 The income calculated in 5.2, above, is Ahmed's annual income before deductions. 18% is deducted for tax and 1% for UIF (Unemployment Insurance Fund). How much is his net pay (i.e. income after deductions)?

5.4 If the club were to decide that Ahmed must stop all overtime work, what effect would this have on Ahmed's average annual income as calculated in 5.2?

5.5 Joshua's taxable income is R49 178,49. The pie chart below shows how it is apportioned. Calculate the Rands value of each of the sections (check that your answers add up to the taxable income).



5.6 The club committee has proposed that Joshua enroll with Encounter Medical Aid. Joshua will be expected to pay 40% of the cost and the Bayview Soccer Club will contribute the other 60%. *Encounter* offers three options:

	Option 1	Option 2	Option 3
	Premier	Maxi	Core
Member	R686	R430	R370
Per adult dependent	R626	R355	R306
Per child dependent	R220	R199	R171

Note: Member = Joshua, Adult dependent = Joshua's wife

Joshua would like the best possible cover, but needs at least R2 500 per month of his net pay to cover his day-to-day living expenses. He is married with two children.

Determine by calculation which package (if any) is the best that he can afford on his current salary.

5.7 What do you think are the advantages of being a salaried worker like Joshua over being paid by the hour like Ahmed?

Activity 6 — Salaries in the Context of the Market

ABOUT THIS ACTIVITY

In this activity the students develop their understanding of pay package and explore options in remuneration. The students learn to compare the salary of an employee with the market and make informed predictions following the market pattern.

This activity is aligned with unit standard 9011 and addresses AC 1, 2, and 3 of SO3.

MANAGING THIS ACTIVITY

6.1 Joshua is paid between the 25th and 50th percentile

6.2 Difference = R56 750 – R56 527
= R223,00

Joshua's salary is R223,00 below the market 50th percentile

6.3 Difference = R76 267 – R68 743
= R7 524,00

Joshua's salary is R7524,00 above the market 50th percentile

6.4 Highest % increase (15%) in 2001
Highest Rands increase (R6934) in 2007

6.5 The students need to be made aware of the effect of a percentage increase.
The bigger the original figure, the bigger a percentage of it will be.
Here we see that:

15% of R34 219 = R5132.85

and

10% of R69333 = R6933.30

Because the 'base'is bigger, even a lower percentage increase yields a larger Rand increase.

6.6 The increase is in keeping with inflation.

6.7 The club was already addressing the need to increase Joshua's salary. Increases were all well above inflation and would therefore boost his pay in relation to the market.

6.8 Answers will vary here and should be discussed. The % move in the 50th percentile has been dropping slightly each year. If the move is 6% in 2007 then it is fair to extrapolate a ±5,8% move in 2008.

$\therefore$ R68 743 × 105,8% = R72 730,09

Accept any answers that are correctly calculated and extrapolating in the right direction!

6.9 This is an open-ended question. Discussion could cover the following areas:

- Retention — clearly if the club places a high value on Joshua's services, this needs to be reflected in his remuneration package. If Joshua's performance consistently meets the standards agreed, or exceeds them it should be plain to the club committee that the club cannot afford to lose Joshua before the 2010 World Cup.
- Motivation — generally speaking, the more a worker is paid, the more he will value his job and the better he will feel about his work. The club needs workers who feel good about their lifestyles and good about the place that they work. Of course, it needs to be recognized that more pay does not always equal more work. A point will be reached where no matter how much the worker is paid, better work cannot be achieved with the available resources and in the available time.
- The club must consider their resources. There is little point in raising Joshua's salary beyond the means of the club. Any increase must be budgeted for.

Activity 6 — Salaries in the context of the market

Joshua Ngalo is the Clubhouse Supervisor for the Bayside Soccer Club. He is a valued employee, playing a key role, and the club wants to be sure to retain his services by strategically remunerating him well. One of the club members, who works in this field, is approached to do an analysis of Joshua's pay against the market trend for his job description. His findings and strategy for change are summarized in the graph and table entitled *Monthly Remuneration – Tabular Comparison* on the handout. Refer to the handout and answer the following questions:

6.1 On the graph the market is divided into percentiles. These show the highest 25% of earners in this category above the 75th percentile and go down to the lowest 25% below the 25th percentile. Which of the following words would best describe Joshua's remuneration in 2003:

- paid above the market's 75th percentile
- paid between the market's 50th and 75th percentile
- paid between the market's 25th and 50th percentile
- paid below the market's 25th percentile

The member advising the club suggests that if the club wishes to keep Joshua in its employ it needs to pay him between the market's 50th and 75th percentile. The graphs and tables outline a strategy to increase Joshua's pay.

6.2 What is the difference between Joshua's pay and the market 50th percentile salary in 2003?

6.3 How will Joshua's salary relate to the market 50th percentile by 2007 if the strategy is followed?

6.4 In which year does his salary undergo the highest:

- percentage increase?
- Rand increase?

6.5 Explain why, in years 2005 to 2007, the Rand increase amounts are each larger than in the year before, even though the percentage increase is falling over the same period?

6.6 Why do you think that the % move of the SA 50th percentile ranges between 6% and 9% for the time shown? (What is driving the figures in the National survey higher each year?)

6.7 Consider the proposed strategy for 2005, 2006 and 2007. Now review the progress made between 2000 and 2004. Was the club on the right track already or not? Give a reason for your answer.

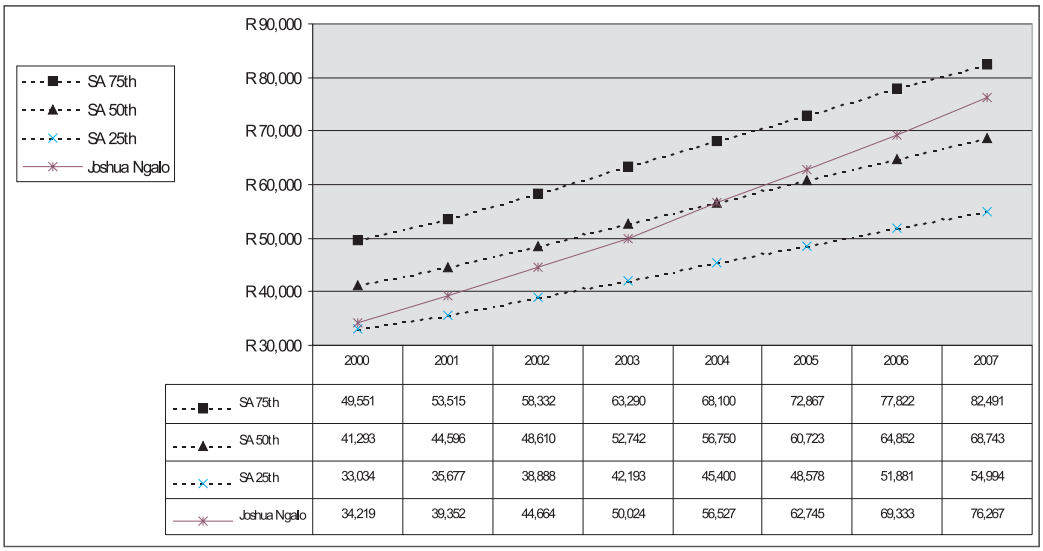
6.8 Following the trend in the SA 50th % move, extrapolate (i.e. make an informed prediction following the established pattern) the SA 50th percentile salary for 2008. Clearly show all steps with reasons.

6.9 The club intends to host international teams in the 2010 World Cup. Joshua's efficiency and capability are seen as key given his track record and his extensive knowledge of the club's operations. The committee intends recruiting further people for a rapidly expanding operation in due course. At this stage it is expected that Joshua will become the Club Manager. At the same time the committee is becoming very concerned about other clubs head hunting good club staff. With this in mind, if you were advising the club committee, would you:

- Leave Joshua's remuneration between the 50th and 75th percentiles
  Or
- Continue to move his salary to a higher position – above the 75th percentile

Give good reasons to the committee in support of the advice you are giving.

Annual Total (Gross) Remuneration - Tabular Comparison								
Clubhouse Supervisor - Joshua Ngalo								
Comparison with Natonal Survey	2000	2001	2002	2003	2004	2005	2006	2007
SA 75th	49,551	53,515	58,332	63,290	68,100	72,867	77,822	82,491
SA 50th	41,293	44,596	48,610	52,742	56,750	60,723	64,852	68,743
SA 50th % Move		8.00%	9.00%	8.50%	7.60%	7.00%	6.80%	6.00%
SA 25th	33,034	35,677	38,888	42,193	45,400	48,578	51,881	54,994
Data, above, is in respect of jobs in the SA Market generally.								
Data, below, is in respect of Joshua Ngalo, the Clubhouse Supervisor, over some years.								
Joshua Ngalo	34,219	39,352	44,664	50,024	56,527	62,745	69,333	76,267
J. Ngalo % Move		15.00%	13.50%	12.00%	13.00%	11.00%	10.50%	10.00%
Compar-Ratio	83	88	92	95	100	103	107	111



Activity 7 — New Kit Purchase

ABOUT THIS ACTIVITY

This activity looks at the costs involved in the purchase of a new kit for a soccer team. The students perform calculations involving mark up, discounts and foreign exchange and finally critically analyse the budget.

This activity is aligned with unit standard 9011 and addresses AC 1, 2, 3 and 4 of SO1 and AC 1, 2, 3, 4 and 5 of SO2.

MANAGING THIS ACTIVITY

7.1 Number of players in all 4 teams = (11+2) × 4
= 52
Total cost per player = 200+65+24
= R 289,00
Total cost of kitting out all four teams = 52×289
= R15 028,00

7.2 Discounted price of one shirt = R200 – 45%
= R110,00
Cost of printing logo = R25
∴ Cost of discounted shirt with logo = R135,00

7.3 Original cost of shirts = 52×200
= R10 400,00
Saving = 10 400 – (52 × 135)
= R3 380,00

7.4 Selling price = 135+33%
= R179,55

7.5 Saving = 25 × 15%
= R3,75

7.6 €39 × 7,68 = R299,52

7.7 Cost per pair of boots = 299,52 + 5%
= 299,52+14,97
= R314,49

7.8 Total cost of 1 kit = 314,49+(135-3,75)+65+24
= R534,74

7.9 Fan merchandise = 131,25 × 48
= R6 300,00
Total cost of kits = 534,74 × 52
= R27 806,48
Total expenditure = 6 300,00 + 27 806,48
= R34 106,48

7.10 Income from fan merchandise = 179,55 × 48
= R8 618,40
Total income = 8 618,40 + 27 806,48
= R36 424,88

7.11 Total profit = 36 424,88 – 34 106,48
= R2 318,40

7.12 Students should be made aware that the budget is calculated by increasing by 5% compounding each year
e.g (R175 × 105%) × 105% = R192,94

Budgeted Prices

Standard soccer shirt	R 192,94
Soccer shorts	R 60,64
Socks	R 23,15
Boots	R 275,63

7.13

ITEMS	No.	Budgeted per item	Actual cost per item	Actual total cost	Income from sales	NET profit or loss
Shirts	100	192,94	131,25	13 125,00	15 443,40	2 318,40
Shorts	52	60,64	65,00	3 380,00	3 380,00	0,00
Socks	52	23,15	24,00	1 248,00	1 248,00	0,00
Boots	52	275,63	299,52	15 575,04	15 575,04	0,00
Total	256	552,36	523,52	33 703,04	35 841,44	2 318,40

7.14 Yes. Not only did the club manage to purchase the kit for less than the total budgeted amount by taking advantage of deals available, but they also managed to sell some kit at a profit.

Activity 7 — New Kit Purchase

The Bayside Soccer Club has to order in new kit and find the most cost effective option. They have a senior team, two over-19 teams and a junior team, each with eleven players and two substitutes. The club kit consists of a shirt, shorts, socks and boots for each player.

7.1 Using this extract of the price list from their suppliers Sports Inc., what will it cost in total to kit out all four teams (boots excluded)?

Standard soccer shirt	R 200
Soccer shorts	R 65
Soccer socks	R 24

Sports Inc. says it will discount all the soccer shirts by 45% if Bayside gets the Sports Inc. logo printed on them.

Pronto Print will print the Sports Inc. logo on the number of shirts needed at a price of R 25 per shirt.

7.2 What is the total cost of a discounted shirt with the printed logo?

7.3 How much will they save by taking up this offer?

7.4 Bayside decides to order some extra shirts for fan merchandise. If their mark up is 33%, what will their selling price be?

7.5 *Pronto Print* offers a discount of 15% for ordering in bulk (100 or more). If the club gets 100 shirts printed in total, how much less will they be paying per shirt for the printing?

The Bayside Soccer Club's other supplier, *Foot Sportz*, gets boots imported from Italy at a cost of €39 a pair. The currency exchange rate used is taken on the day of purchase and the cost in rands is given by the formula:

€ × 7.68 = 1R

7.6 What does a pair of boots cost in rands?

7.7 Usually *Foot Sportz* would mark up a pair of boots by 35% but as part of the sponsorship deal they sell them to Bayside at a mark up of only 5%. How much is Bayside paying for a pair of boots?

7.8 What is the total cost of a kit for one player?

7.9 What has the club's total expenditure been?

7.10 Calculate the income generated by selling 1 full kit to each player at cost and the rest of the shirts at the mark up cost for fans.

7.11 Calculate the total profit.

7.12 The cost per item two years ago was as follows:

Standard soccer shirt	R 175
Soccer shorts	R 55
Socks	R 21
Boots	R 250

The club used a conservative inflation rate of 5% to calculate what to budget for this year's kit renewal. What costs did they therefore budget for each item?

7.13 Copy out the table below and use what you have found out above to complete it:

ITEMS	No.	Budgeted per item	Actual Cost per item	Actual total cost	Income from Sales	NET profit or loss
Shirts						
Shorts						
Socks						
Boots						

7.14 By comparing the club's budgeted figures to the actual figures in the table, assess whether or not you think the club has dealt with purchasing new kit cost-effectively.

Activity 8 — Bayside Soccer Tour

ABOUT THIS ACTIVITY

In this activity the students prepare a cost analysis for a soccer team tour to a foreign country. The activity involves the reading, analysis and comparison of information from a variety of sources, including tables and graphs. Calculations involving substitution into formulas and percentage are performed.

This activity is aligned with unit standard 9011 and addresses AC 1, 2, and 3 of SO1.

MANAGING THIS ACTIVITY

8.1 Difference = 844,5946 – 791,1392
= 53,4554
You can buy 53,46 more dollars on Thursday.

8.2 This question can be used as a springboard for a discussion.
The Zimbabwean dollar is not stable (It moves from 842,4600 dollars to 791,1392 dollars and back up to 844,5946 dollars against the rand in 7 days!). This instability can be linked to a political and economic instability in Zimbabwe. In January 2003 the annual inflation rate in Zimbabwe was 200% and in April 2004 the inflation rate was 583,7%.

8.3 BWP100,00 = R$(100 \times \frac{1}{0,7243})$
= R138,06 (rounded to the nearest cent)
BWP25,50 = R$(25,50 \times \frac{1}{0,7243})$
= R35,21 (rounded to the nearest cent)

8.4 See completed control sheet at the end of solution 8.10.
Students need to be guided as to whether they are calculating values correctly as they go along.

8.5 See completed control sheet at the end of solution 8.10.

8.6 See completed control sheet at the end of solution 8.10.

8.7 A Travel Wallet would be secure because:
- only a person with the correct PIN (personal identity number) can withdraw money from an ATM using the card
- theft of the card does not mean that the money itself is stolen — a stolen card can be cancelled
- only the money which is withdrawn is exchanged at the exchange rate for that day, so that if the rate is unfavourable the balance of the money is not affected
- Great Britain pounds are a stable currency so the fluctuating value of the Zimbabwe dollar will not cause all the money to devalue as it could if the coach carried all the money in cash.

and convenient because:
- it is small and easy to carry
- it allows access to money at any valid ATM

8.8

	PROS	CONS
Anthea's way	Less money is spent on transaction fees	Coach has to carry more money on him
Coach's way	More money is spent on transaction fees	Better security and convenience for coach

8.9 Cost of Busabout = R4 000,00 – 15%
= R3 400
Cost of The Speedy Bus Company = R4 500,00 – R750,00
= R3 750
Busabout is more economical.

8.10 See control sheet.

Individual Member's Contribution = Final ÷ Total number of players
= R9928,95 ÷ 26
= R381.88

CONTROL SHEET Bayside Tour 2004								
Accomodation	**Destination**	**Currency**	**Cost in Local Currency**	**Exchange Rate**	**Cost in Rands**	**Deposit in Local Currency**	**Balance due in local currency**	**Balance due in Rands**
	Gaborone	BWP	6750.00	0.7289	9260.53	2025.00	4725	6482.37
	Francestown	BWP	5400.00	0.7289	7408.42	1620.00	3780	5185.90
	Bulawayo	ZWD	2280405.00	844.5946	2700.00	1026182.25	1254222.8	1485.00
	Harare	ZWD	1824324.00	844.5946	2160.00	820945.80	1003378.2	1188.00
Sub Totals					21528.95			14341.27
Transport					3400.00			
Total Costs					24928.95			
Subsidy					15000.00			
Total due from players					9928.95			

Activity 8 — Bayside Soccer Tour

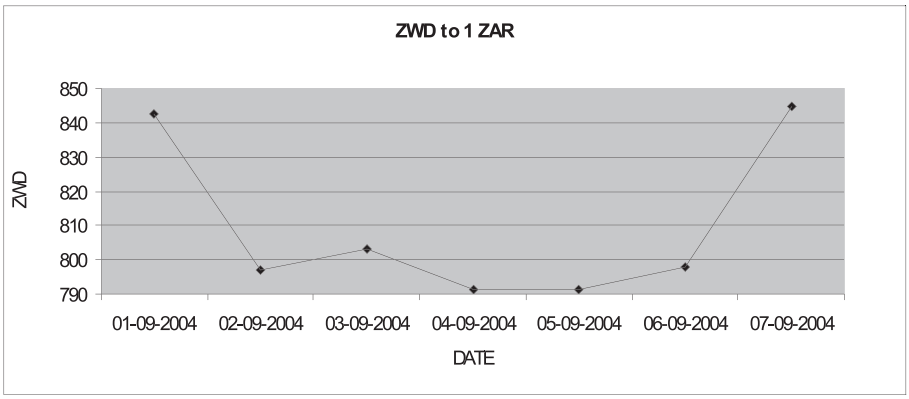
The Bayside Over 19A and B teams are going on tour to Zimbabwe and Botswana. The club can subsidise the tour by R15 000,00 and needs to budget to calculate the costs to be carried by the tour members.

Botswana and Zimbabwe have a different currency to South Africa and each other. The exchange rates change daily.

8.1 Refer to the table below. How many more Zimbabwe dollars (ZWD) could you buy with R1,00 (ZAR) on Thursday 6 September 2004 than you could buy on Wednesday 5 September 2004?

DATE	ZWD to 1 ZAR
01/09/04	842,4600
02/09/04	796,8127
03/09/04	803,2129
04/09/04	791,1392
05/09/04	791,1392
06/09/04	798,0846
07/09/04	844,5946

8.2 The graph below tracks the changes in the value of the Zimbabwean dollar against the South African rand described in the table above. Comment on the changes over the days shown in the graph. What reasons can you think of for this trend?



8.3 If on Thursday 6 September the ZAR : BWP (SA rands : Botswanan pula) exchange rate is 1 : 0,7243, how many 5rands could you buy with:

- BWP100,00?
- BWP25,50?

8.4 The control sheet for the tour budget is on the handout entitled *Bayside Tour 2004*. The accommodation costs for the tour are shown in Zimbabwe dollars and Botswanan Pula. The exchange rates, on the day that the accommodation is booked, are shown in the table below. Calculate the equivalent Rand values and fill them in on the control sheet.

	Value to 1 South African rand on 7/9/04
Zimbabwe dollars	844,5946
Botwsanan pula	0,7289

8.5 Anthea, the treasurer, pays a deposit to each of the hotels that the teams will stay in on their tour. The deposits are shown on the control sheet in local currency. The balance needs to be paid by the coach on arrival at the hotels in local currency. Calculate how much he needs to pay at each hotel.

8.6 Calculate, at the same rate of exchange as 8.4, how many rands the payments in 8.5 come to.

Anthea now has to make the choice of which currency exchange option to use. She chooses a *Travel Wallet* as a secure and convenient solution. A *Travel Wallet* is a card that is loaded up (like a phone card) with a stable currency, like British pounds, and can be used at any ATM machine (the ATM will calculate the local currency equivalent at the exchange rate on the day it is used).

8.7 Do you agree that a Travel Wallet would be a "secure and convenient solution". Justify your answer.

8.8 There is a standard fee of £1,50 (one-and-a-half British pound) for every ATM transaction. Anthea recommends that when the coach draws the money to pay for the hotel he also draws out extra cash for other uses. The coach prefers to draw out the extra cash in separate transactions as he needs it. Discuss the pros and cons of each approach.

8.9 The club will hire a bus to transport the teams for the duration of the whole tour.
Busabout Tours quotes R4 000,00 but offers a discount of 15% if payment is made in full up front.
The Speedy Bus Company quotes R4 500,00 but offers a R750,00 discount if full payment is made in advance.
Anthea chooses the more economical option. Fill in the appropriate cost under "Transport" on the control sheet.

8.10 Total the "Cost in rands" column of the control sheet. Subtract the club subsidy. This total represents total money to be paid by the team members. If each of the soccer teams going on tour has 11 members and two reserves and the coach's costs are covered by the subsidy, calculate how much each soccer team member needs to contribute towards the tour costs.

CONTROL SHEET Bayside Tour 2004								
Accomodation	**Destination**	**Currency**	**Cost in Local Currency**	**Exchange Rate**	**Cost in Rands**	**Deposit in Local Currency**	**Balance due in local currency**	**Balance due in Rands**
	Gaborone	BWP	6750.00	0.7289		2025.00		
	Francestown	BWP	5400.00	0.7289		1620.00		
	Bulawayo	ZWD	2280405.00	844.5946		1026182.25		
	Harare	ZWD	1824324.00	844.5946		820945.80		
Sub Totals								
Transport								
Total Costs								
Subsidy					15 000,00			
Total due from players								

Activity 9 — The Bayside Challenge Budget

ABOUT THIS ACTIVITY

In this activity students prepare a budget sheet for a fund raising activity. Income and expenditure are analysed and compared with figures from the previous year. The students are asked to make recommendations to increase profitability and to suggest appropriate budgeting for the next financial year.

This activity is aligned with unit standard 9011 and addresses AC 1, 2, 3 and 4 of SO1.

MANAGING THIS ACTIVITY

9.1 2002 was a better operating year.

In 2003 the Bayside Challenge brought in a lower actual income and had higher expenses than 2002, hence the profit of R2 642,76 in 2003 was significantly lower than the profit of R 13824,37 in 2002. In 2003 the entry fees recorded were lower than in 2002, which indicates that more people entered the tournament in 2002. Students will need to understand that expenses are likely to increase annually because of inflation.

9.2 No.

Without knowing the entry fee per player it is not possible to work out how many players there were.

9.3 $$\frac{income}{fee} = \frac{8700}{20}$$

Number of entrants = 435

9.4 Income from fees can be boosted by:

- Increasing the entrance fee per person — this will boost the income even if the number of entrants remains the same.
- Increasing the number of entrants — this could be achieved by improved marketing of the event.

9.5 % of 2003 income from sponsorship $= \frac{23000}{31200} \times 100$

= 74% (rounded up to the nearest %)

9.6 The club did not expect sponsorship from *Sports Inc.* in 2003. The budget column shows planned income and expenditure. As there is no entry against *Sports Inc* in the budget column for 2003 it is clear that sponsorship was not expected from them.

9.7 Estimated increase $= \frac{25\,000 - 20\,000}{20\,000} \times 100$

= 25%

There are a number of possible reasons that could be given here. Students may have something in the following vein:

- *Foot Sportz* had a bad financial year and cut the funds allocated to sponsorship.
- *Foot Sportz* was disappointed with the publicity that the Bayside Challenge brought them in 2002.
- Another group attracted sponsorship from Foot Sportz and so they split their sponsorship budget.
- 25% is well above inflation and therefore possibly unrealistic.

9.8 Expected 2004 sponsorship $= 23\,000 \times \frac{115}{100}$

= R26 450

9.9 The club did not budget in 2003 for postage and photocopying. R406,50 appears in the actual column but not in the budget column.

9.10 A deficit is shown in brackets — it this case the club budgeted for a loss of R260,00.

9.11 Difference = 2003 Actual – 2003 Budget
= 2 642,76-(-260,00)
= R2 902,76

There may need to be some discussion about the double negative.

9.12 The answers given here will vary and could include any of the following:
- Fund raisers suchas the sale of food during matches.
- Advertising / marketing to increase numbers and attract more sponsorship.

9.13/9.14 The answers given here will vary.

The budget should allow for an increase of at least 5% in sponsorship and expenses due to inflation. Any other significant changes must be justified with a valid explanation. There is little point in running the event at a loss. The students should aim for a realistic profit and avoid a deficit as there was in the 2003 budget.

Check that the students' calculations are accurate. Below is a conservative sample budget.

Sample Budget

BAYSIDE CHALLENGE
BUDGET 2004

	BUDGET 2004	ACTUAL 2003	BUDGET 2003	ACTUAL 2002
INCOME	32760.00	31200.00	33700.00	32487.19
FOOT-SPORTZ SPONSORSHIP	24150.00	23000.00	25000.00	20000.00
ENTRY FEES	8610.00	8200.00	8700.00	9250.00
SPORTS INC SPONSORSHIP				3000.00
CATERING NET INCOME				237.19
EXPENDITURE	30010.00	28557.24	33960.00	18662.82
POSTERS	1575.00	1500.00	1000.00	250.00
T-SHIRTS	5830.00	5550.00	8160.00	5596.32
LITHO PRINT FOR LOGO				110.00
PLAYER MEALS	420.00	400.00	1500.00	444.00
PETROL	700.00	663.49	2100.00	320.00
FIRST AID TEAM CONTRIBUTION	7875.00	7500.00	6500.00	1000.00
NFA CONTRIBUTION	3000.00	2850.00	2500.00	2000.00
REFEREE BRIEFING	150.00	139.25	500.00	492.50
FIRST PRIZE	5250.00	5000.00	7000.00	6000.00
CASH PRIZES	1840.00	1750.00	3000.00	1750.00
JOSHUA	525.00	500.00	300.00	300.00
SECURITY GUARDS	1260.00	1200.00	400.00	400.00
OTHER PRIZES	1155.00	1098.00	1000.00	
POSTAGE/PHOTOCOPYING	430.00	406.50		
PROFIT/(LOSS)	2750.00	2642.76	-260.00	13824.37
TRANSFER TO EVENTS ACCOUNT				3000.00
FINAL PROFIT TO CLUB	2750.00	2642.76	-260.00	10824.37

Activity 9 — The Bayside Challenge Budget

The Bayside Soccer Club holds an annual soccer tournament called the "Bayside Challenge". For an event of this kind it is necessary to budget. A budget is a plan for income and expenses in the future, based on income and expenditure in the past.

Refer to the handout entitled "Bayside Challenge", which shows budgeted and actual costs in 2002 and 2003 as well as a blank column for the 2004 budget.

9.1 In which year was the Bayside Challenge more "successful"? Give a reason for your answer.

9.2 Do the income figures inform the reader how many players took part in the tournament?

9.3 If it is known that the entry fee in 2003 was R20 per player, how many players entered?

9.4 Name two ways in which the income from entry fees could be boosted.

9.5 In 2002 the actual income from sponsorship was 71% of the total income, calculated as follows:

$$\frac{23\,000 + 3\,000}{32\,487.19} \times 100 = 71\%$$

What percentage of the actual income came from sponsorship in 2003?

9.6 Which sponsor did not contribute in 2003?

Was the club expecting sponsorship from this sponsor? How do you know this?

9.7 In 2003 *Foot Sportz* increased their 2002 sponsorship by 15%, calculated as follows:

$$\frac{23\,000 - 20\,000}{20\,000} \times 100 = 15\%$$

What percentage increase had the club estimated in their 2003 budget?

Suggest one reason why *Foot Sportz* might have decided to give a lower increase than the club had budgeted for.

9.8 In 2004, what sponsorship could the club expect from Foot Sportz if they were to increase their 2003 sponsorship by 15% again?

9.9 For which actual expense, in 2003, did the club not budget?

9.10 In 2002 the club committee budgeted a loss of R260 on the Bayside Challenge. How is a deficit (as opposed to a profit) shown on the budget sheet?

9.11 By how many rands was their actual profit/deficit different from their budgeted one?

9.12 What else could the club do to increase income / profit if it wants to?

9.13 Use what you have learned so far to prepare a "Bayside Challenge" budget for 2004. Fill in your budget in the "Budget 2004" column of the handout.

Suggested Steps

- Determine each amount as being increased from the 2003 level by 5%, as part of the adjustment necessary to match the inflation rate.

(Inflation is the rate at which the cost of goods and services increases.)

- Adjust each of the above by deciding whether you see a need to adjust it "up" or "down", in terms of what you imagine, feel or know the expenses might be for "The Bayside Challenge" in 2004.

9.14 Write a brief explanation of each of the budgeted amounts you have made. It may be helpful to imagine you are the manager of the club and you have to present your budget, for 2004, to the club committee, which is responsible for approving it.

BAYSIDE CHALLENGE
BUDGET 2004

	BUDGET 2004	ACTUAL 2003	BUDGET 2003	ACTUAL 2002
INCOME		31200.00	33700.00	32487.19
FOOT-SPORTZ SPONSORSHIP		23000.00	25000.00	20000.00
ENTRY FEES		8200.00	8700.00	9250.00
SPORTS INC SPONSORSHIP				3000.00
CATERING NET INCOME				237.19
EXPENDITURE		28557.24	33960.00	18662.82
POSTERS		1500.00	1000.00	250.00
T-SHIRTS		5550.00	8160.00	5596.32
LITHO PRINT FOR LOGO				110.00
PLAYER MEALS		400.00	1500.00	444.00
PETROL		663.49	2100.00	320.00
FIRST AID TEAM CONTRIBUTION		7500.00	6500.00	1000.00
NFA CONTRIBUTION		2850.00	2500.00	2000.00
REFEREE BRIEFING		139.25	500.00	492.50
FIRST PRIZE		5000.00	7000.00	6000.00
CASH PRIZES		1750.00	3000.00	1750.00
JOSHUA		500.00	300.00	300.00
SECURITY GUARDS		1200.00	400.00	400.00
OTHER PRIZES		1098.00	1000.00	
POSTAGE/PHOTOCOPYING		406.50		
PROFIT/(LOSS)		2642.76	(260.00)	13824.37
TRANSFER TO EVENTS ACCOUNT				3000.00
FINAL PROFIT TO CLUB		2642.76	(260.00)	10824.37

Activity 10 — Increasing the Staff Complement

ABOUT THIS ACTIVITY

This activity looks at the decisions that need to be made by management regarding affordability, equity and market relatedness, when a business wishes to increase its staff complement. In this activity the students compare actual and budgeted costs and then extrapolate to budget for future growth.

This activity is aligned with unit standard 9011 and addresses AC 1, 2 and 3 of SO1, and AC 1, 2 and 3 of SO3.

MANAGING THIS ACTIVITY

This activity might best be tackled in groups. Discussion about the club committee's choices should be encouraged. Some of the answers, once calculated, must be filled in on the handout. The use of the handout as a summary allows the student to see the whole remuneration plan.

10.1 % increase of staff $= \frac{10 - 2}{2} \times 100$

$= 400\%$

10.2 % increase $= \frac{62\,745 - 56\,527}{56\,527} \times 100$

$= 11\%$

10.3 % Increase $= \frac{69\,333 - 62\,745}{62\,745} \times 100$

$= 10{,}5\%$

10.4 Budgeted remuneration = R51 840 x 115%

= R59 616,00

See table below.

10.5 Groundsman's remuneration = (head groundsman's remuneration × 65%) ×118%

= R45 725,47

See table below.

10.6 Total for budgeted remuneration in 2005 = R 287 489,47

% increase from 2004 to 2005 $= \frac{287\,489 - 108\,367}{108\,367} \times 100$

$= 165{,}29\%$

2004				2005			2006		
Staff Position	No.	Budget	Actual	Staff Position	No.	Budget	Staff Position	No.	Budget
Club Supervisor	1	55000.00	56527.00	Club Manager	1	62745.00	Club Manager	1	69333.00
Groundsman	1	52000.00	51840.00	Head Groundsman	1	59616.00	Head Groundsman	1	61865.00
				Club Secretary	1	44000.00	Club Secretary	1	47461.00
				Groundsman	1	45725.47	Groundsman	1	46779.00
							Barman	1	40677.00
							Driver	1	35372.00
				Cleaner	1	27528.00	Cleaner	1	30758.00
				General Worker	2	47875.00	General Workers	3	80238.00
	2	107000.00	108367.00		7	287489.47		10	412483.00

10.7 Rand increase from 2004 to 2006 = R304 116,00

% increase from 2004 to 2006 = 280,64%

10.8 If viewed in the light of exciting growth plans for the Bayside Soccer Club, the rapid increase in staff may seem sensible.

On the other hand, from a financial point of view growth of staff numbers needs to be affordable by the club from month to month — even in the soccer "off season".

The committee needs to decide carefully how much money goes towards remuneration and how much is spent on carrying out plans for development.

10.9 Examples of that might be left vacant in 2005 (with possible reasons):

- Club secretary — members of the club could continue to help out with some of this work load. Also, the newly promoted club manager (see graph) will be able to describe the position of secretary more accurately after some time has passed. This may lead to appointing, say, a secretary, on a more junior level with much lower remuneration. The club can then plan to train the person for a larger role in the organization as it grows.
- Groundsman — the head groundsman could still maintain the club grounds as before but, in 2005, with the assistance of the 2 general workers.
- Cleaner — one of the General Workers could be assigned cleaning duties.

10.10 The student, here, should be expected to "brainstorm" ways of increasing income. In a group discussion each student could outline his/her "first choice" for increasing income. Ideas might include increasing membership fees, increasing the number of members, fund raising activities and attracting more sponsorship.

10.11 Some aspects for noting in the graph:

- The line reflecting the survey, per job, is relatively smooth (it reflects data from a number of other organizations).
- The line reflects the club's remuneration. Comparing this line to the surveyed levels will provide information for managing the club's remuneration.
- The two highest paid individuals are paid "at levels higher than the survey".
  All other staff members are paid at lower levels.
- The groundsman and secretary, in the scenario, are paid nearest to the survey level (in rand terms).

10.12 The cost of bringing the groundsman's remuneration to the level of the survey would be an additional R 2 221,00 per annum.

10.13 Some reasons for not increasing all remuneration to "survey levels", all at once:

- This avoids commitment of large sums of money which the club can't afford while it is still a small, growing organization.
- The survey level is generally appropriate for staff members who are already competent in their jobs. One strategy is for the club to pay only enough to attract a new recruit into the job. (Later on the staff member's performance can be rewarded well each year – this should keep the individual motivated and the increasing costs can be covered carefully by the club's rising income.)

Group discussion could touch on which jobs need to be paid nearer to the survey levels than others. These are important strategic decisions, for example to recognize valuable experience and performance and not to lose staff members to other organizations.

10.14 In the light of previous questions, well-motivated reasons for paying these two experienced employees above survey levels can be shared in discussion. One factor which contributes to the level that staff members are paid is whether their services are scarce in the market. For example, if it is difficult to attract and retain the services of a good club groundsman, capable of maintaining and improving fields dramatically, the club may well decide to pay the head groundsman consistently "well above the surveyed level" for other clubs.

Activity 10 — Increasing the Staff Complement

To understand how various needs of an organisation can affect the cost of employing people, consider the following scenarios. (A scenario is a sequence of imagined events.)
In this case the scenario develops in terms of exciting changes which the committee of the Bayside Soccer Club is anticipating. Some aspects of these include a club that is much more prominent, teams playing much more important and profitable fixtures with sponsorship increasing dramatically as the club grows.

With a view to the future, when the Bayside Soccer Club needs to be a much larger organisation, the committee decides to review the staffing of the club to better understand when, and how, the number of staff needs to grow and to be able to budget for these costs. Remuneration costs already form the biggest part of the club's expenditure. The committee needs to form a picture of how the remuneration costs may need to grow and how these changes can be afforded.

The current situation, in 2004, sees the club with 2 members of staff who receive payment. The rest of the work is done by members who receive no payment (honorary work). The committee realises that many of these club members will not be able to continue helping the club as they have been doing if the club grows as anticipated.

Members of the committee develop the scenario, above, in more detail and estimate that when the interest in soccer will be great, in 2010, the Bayside Soccer Club may employ 30 people. The committee plans to have 10 employees on the staff by 2006.

10.1 Calculate the percentage increase of staff from 2004 to 2006.

Budgeting – refer to the handout
For the club supervisor in 2004 (becoming the club manager in 2005), calculate the following increases:

10.2 The percentage increase from "Actual in 2004" to "Budget in 2005".

10.3 The percentage increase from "Budget in 2005" to "Budget in 2006".

Promoting
The groundsman in 2004 is promoted in 2005 to the position of head groundsman. The committee grants an increase of 15%.

10.4 Calculate, in rands, the head groundsman's budgeted remuneration in 2005, from the actual level in 2004. Fill in your answer in the relevant space in the table on the handout.

Recruiting
In 2005 the club plans to recruit 5 new members of staff. One of these is a new groundsman who is appointed, as a trainee, at a remuneration level 65% of that of the head groundsman. Very soon the committee realises that the new groundsman is showing promise. On the other hand the committee becomes aware that a rival club may be trying to "headhunt" him and make him an attractive offer. The committee decides that the "trainee" period is over and grants the groundsman an increase of 18%.

10.5 Given the above, calculate in rand terms, what the groundsman's final remuneration would be in 2005. Record your result in the table on the handout.

Consideration of some aspects of the scenario

10.6 Calculate the total for budgeted remuneration, in 2005, and record the result in the table on the handout. Next, express the increase from the 2004 actual total to the 2005 budgeted total as a percentage.

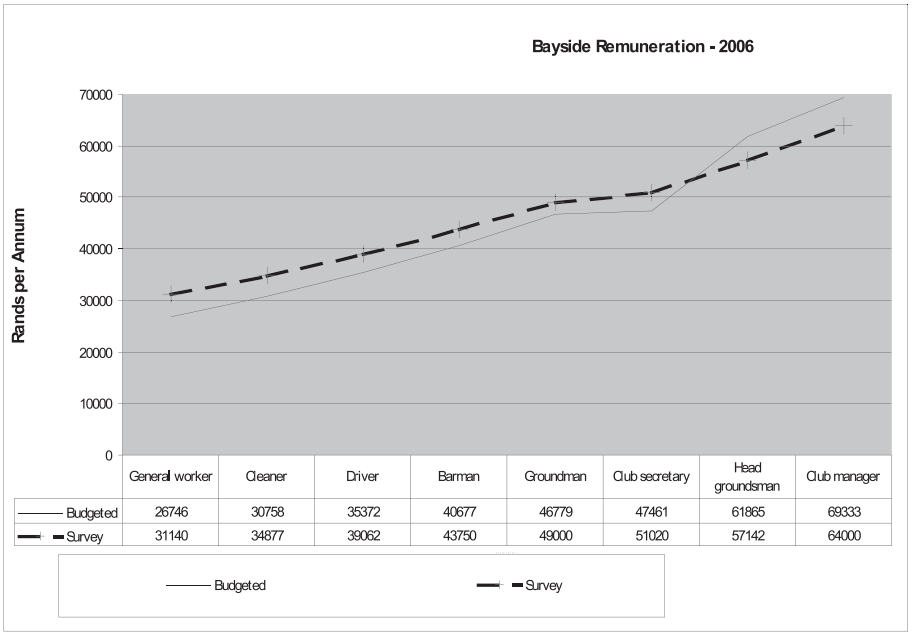
10.7 Calculate the increase from the 2004 actual total to the 2006 budgeted total in rands. Now express the increase as a percentage.

10.8 Do the increases, in 10.6 and 10.7, seem realistic? Explain your answer.

10.9 Indicate two staff positions, budgeted for the first time in 2005, that might be left "'vacant" to cut costs. Give reasons for your suggestions.

10.10 Suggest three ideas that might increase income in a soccer club. Give good reasons for your answer in each case.

Below is the graph of the future scenario (including a survey of similar sports clubs "made at the end of 2006"):



	General worker	Cleaner	Driver	Barman	Groundman	Club secretary	Head groundsman	Club manager
Budgeted	26746	30758	35372	40677	46779	47461	61865	69333
Survey	31140	34877	39062	43750	49000	51020	57142	64000

10.11 Comment on the graph in a few sentences. (List some impressions the graph gives you and suggest possible reasons for them.)

10.12 If the club committee, in 2006, were to decide to manage remuneration levels to generally be "in line" with the market, as surveyed, calculate what it would cost to bring the groundsman to the survey level.

10.13 Give two reasons why increasing all of the remuneration amounts to be "the same as the survey of other clubs", all at once, is not necessarily a good idea.

10.14 The two highest paid employees are also the ones whose remuneration is higher than the surveyed levels for their jobs. Consider the graph again and give a possible reason as to why this might be the case.

2004				2005			2006		
Staff Position	No.	Budget	Actual	Staff Position	No.	Budget	Staff Position	No.	Budget
Club Supervisor	1	55000.00	56527.00	Club Manager	1	62745.00	Club Manager	1	69333.00
Groundsman	1	52000.00	51840.00	Head Groundsman	1		Head Groundsman	1	61865.00
				Club Secretary	1	44000.00	Club Secretary	1	47461.00
				Groundsman	1		Groundsman	1	46779.00
							Barman	1	40677.00
							Driver	1	35372.00
				Cleaner	1	27528.00	Cleaner	1	30758.00
				General Worker	2	47875.00	General Workers	3	80238.00
	2	107000.00	108367.00		7			10	412483.00