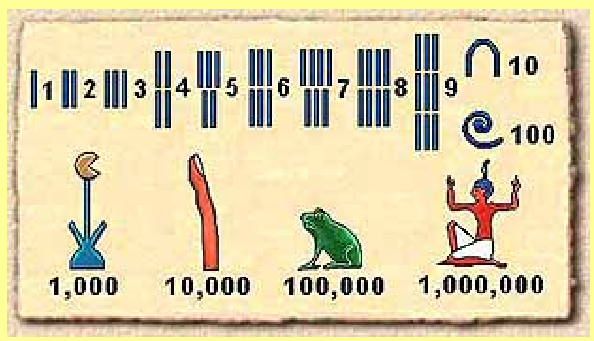
NQF Level: 3 **US No: 7456**

Learner Guide

Primary Agriculture

Use mathematics to investigate and monitor



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agriculture
Department: Agriculture
REPUBLIC OF SOUTH AFRICA

AgriSETA

Before we start…

Dear Learner - This Learner Guide contains all the information to acquire all the knowledge and skills leading to the unit standard:

Title:	Use mathematics to investigate and monitor the financial aspects of personal, business and national issues				
US No:	**7456**	**NQF Level:**	3	**Credits:**	5

The full unit standard will be handed to you by your facilitator. Please read the unit standard at your own time. Whilst reading the unit standard, make a note of your questions and aspects that you do not understand, and discuss it with your facilitator.

This unit standard is one of the building blocks in the qualifications listed below. Please mark the qualification you are currently doing:

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

Please mark the learning program you are enrolled in:

Your facilitator should explain the above concepts to you.

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

This Learner Guide contains all the information, and more, as well as the activities that you will be expected to do during the course of your study. Please keep the activities that you have completed and include it in your **Portfolio of Evidence**. Your PoE will be required during your final assessment.

What is assessment all about?

You will be assessed during the course of your study. This is called *formative assessment*. You will also be assessed on completion of this unit standard. This is called *summative assessment*. Before your assessment, your assessor will discuss the unit standard with you.

Assessment takes place at different intervals of the learning process and includes various activities. Some activities will be done before the commencement of the program whilst others will be done during programme delivery and other after completion of the program.

The assessment experience should be user friendly, transparent and fair. Should you feel that you have been treated unfairly, you have the right to appeal. Please ask your facilitator about the appeals process and make your own notes.

Your activities must be handed in from time to time on request of the facilitator for the following purposes:

- The activities that follow are designed to help you gain the skills, knowledge and attitudes that you need in order to become competent in this learning module.
- It is important that you complete all the activities, as directed in the learner guide and at the time indicated by the facilitator.
- It is important that you ask questions and participate as much as possible in order to play an active roll in reaching competence.
- When you have completed all the activities hand this in to the assessor who will mark it and guide you in areas where additional learning might be required.
- You should not move on to the next step in the assessment process until this step is completed, marked and you have received feedback from the assessor.
- Sources of information to complete these activities should be identified by your facilitator.
- **Please note** that all completed activities, tasks and other items on which you were assessed must be kept in good order as it becomes part of your **Portfolio of Evidence** for final assessment.

Enjoy this learning experience!

How to use this guide ...

Throughout this guide, you will come across certain re-occurring "boxes". These boxes each represent a certain aspect of the learning process, containing information, which would help you with the identification and understanding of these aspects. The following is a list of these boxes and what they represent:

What does it mean? Each learning field is characterized by unique terms and **definitions** – it is important to know and use these terms and definitions correctly. These terms and definitions are highlighted throughout the guide in this manner.

You will be requested to complete **activities**, which could be group activities, or individual activities. Please remember to complete the activities, as the facilitator will assess it and these will become part of your portfolio of evidence. Activities, whether group or individual activities, will be described in this box.

Examples of certain concepts or principles to help you contextualise them easier, will be shown in this box.

The following box indicates a **summary** of concepts that we have covered, and offers you an opportunity to ask questions to your facilitator if you are still feeling unsure of the concepts listed.

My Notes ...

You can use this box to jot down questions you might have, words that you do not understand, instructions given by the facilitator or explanations given by the facilitator or any other remarks that will help you to understand the work better.

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What are we going to learn?

What will I be able to do?

When you have achieved this unit standard, you will be able to:

- Use mathematics to plan and control personal and/or household budgets and income and expenditure.
- Use simple and compound interest to make sense of and define a variety of situations including investments, stokvels, inflation, appreciation and depreciation.

Learning Outcomes

At the end of this learning module, you must is able to demonstrate a basic knowledge and understanding of:

- Budgets.
- Terminology and definitions associated with financial situations.
- Estimation and approximation.
- Compound increase and decrease.

What do I need to know?

It is expected of the learner attempting this unit standard to demonstrate competence against the unit standard:

- The credit value is based on the assumption that people starting to learn towards this unit standard are competent in Mathematics and Communications at NQF level 2

My Notes ...

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Session 1 Budgets and other financial concepts

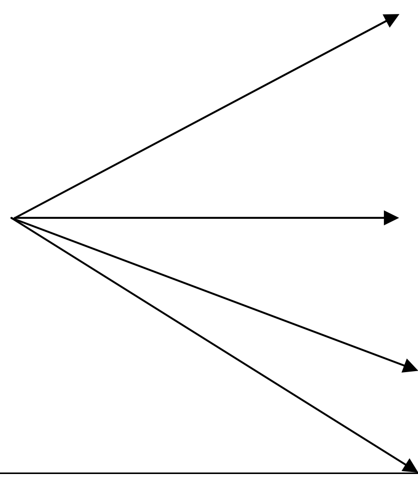
After completing this session, you should be able to:
SO 1: Use mathematics to plan and control personal, regional and/or national budgets and income and expend.

In this session we explore the following concepts:

- Description of a budget.
- Company budgets.
- The budgeting process.
- Profit.

1.1 What is a budget

In your groups discuss your understanding of the word budget.

	Key ideas
Budget 	

Use the ideas you generated to define a budget and write down your definition in the space provided.

BUDGET

Budget	Oxford dictionary defines budget as an estimate or plan of income and expenditure. This plan of expenditure can be drawn weekly, monthly, yearly or even for a longer period, for example, five years, 10 years etc for those people who plan for big projects.

A budget is a plan expressed in financial terms. Budgets can vary in size from a personal budget developed for an individual, to the total annual budget produced by the government for the whole country.

The difference between a forecast and a budget is that a forecast is a prediction of what will happen in a particular situation – it can be a judgement by any competent person – whereas a budget is a target that a business aims to achieve. Moreover, when approved and issued, a budget is a directive to employees to work to achieve the business objectives.

A more precise definition of a budget might therefore be:

Budget	A financial or quantitative statement, prepared in advance of a period of time, reflecting the agreed policies and strategies necessary to meet objectives.

We should all be familiar with the idea of a budget. Few of us embark on any large personal spending project without estimating what it will cost – even if we don't write it down. If, for instance, we are planning to take a holiday, we are likely to spend some time considering where, when, and how we are going to go. Included in this will be an estimate of what it is likely to cost us, so that we can arrange the appropriate funding.

Furthermore, if half way through the holiday we find that we have spent more than we planned, we may have to alter our spending pattern to stay within our total limit. Or alternatively, make arrangements for extra money to be available!

Goal setting

Before you can draw up a personal budget for yourself you set some goals for yourself.

Having trouble meeting your goals? Can't stick to those resolutions that you made? Here are some tips to help you better define your goals, and help you reach them!

- Be specific about what you want to accomplish.

Avoid subjective goals such as, 'I want to save more money each month.' Instead make it a specific goal. In this case, 'I want to save 10% of my income every month.'

- Set realistic goals.

  If you are currently overspending your income by 10% each month, as most Americans are, you can't expect to save 10% in the first month. But you could get to that point in 6 months.

- Break your goals down into measurable, manageable steps.

  It may seem overwhelming to think about reducing your spending in all of your budget categories at once. However, if you cut your spending a little each month in first one category, and then two, etc. it has a domino effect and you can see the benefits right away. Seeing the results immediately helps to keep you motivated and on the path towards your bigger goal.

- Think about your short-term goals and your long-term goals.

  Make sure they are in harmony with each other. If one of your long-term goals is to eliminate all your consumer debt within 5 years, then make sure that one of your short-term goals is to put a certain percentage of your income each month into debt reduction.

- Be flexible in your goals.

  For example, you have a goal of setting aside 3% of your income into your 'emergency fund' each month until it reaches a balance of R3,000… and then you have an unexpected car repair that requires you to use all the money. Just stay on track and keep depositing that 3% each month. After all, that's what the emergency is for, unexpected emergency expenses.

- Review your goals periodically and make adjustments if needed.

  When you check your progress, you may find you are reaching your goal faster than you thought. Why not use this extra motivation to increase the goal? Set those expectations a little higher!

- And last but not least, always write your goals down!

  Putting them in writing will help you to remember them, help your commitment level and help to keep you motivated.

Personal Budget

A basic budget plan knows how much income you will have, how much money you will spend, and how much money, if any, will be left over. Using the information available to you from your bank statement you only know how much money is available at that moment. It doesn't inform you of how much you will need to get through till the next payday or if there will be enough money, after paying all your accounts, to allow you to make that purchase you're contemplating.

If you were paid a fixed amount once a month there is a very easy way to budget your money. You could take a stack of envelopes and label them with the names of all the accounts and expenses you will need to pay during the upcoming month. They could be "Rent", "Utilities", "Car Payment", "Food", etc. Then you would place the amount needed to pay each expense into its envelope. When all the envelopes had the required amounts, the money left over, if any, is the "expendable" money that you are free to spend on non-budgeted items.

As you paid each item you would obtain the required money from the proper envelope. At the end of the month any money left in an envelope could be redistributed along with the new month's income and you would be ready to start over. Using this system you would always know how much money you had available by simply inspecting the envelopes. Any deviations from the "budgeted" amounts are quickly observed and corrections could be made.

While this type of budgeting is very simple, it is not practical for most of us. First, it requires that all payments be made in cash. This alone will eliminate the plan in all but a few cases. Also, most of us have an income that is spread out, in one form or another, during the month. A weekly pay period is an example that would make the above plan very difficult to operate.

An alternative to the use of actual envelopes would be to create your budget on paper. You could project your monthly income and create accounts from which to debit or credit money as accounts are paid and income is received. A Sample Budget in paragraph 1.1.3 explains such a written type of budget.

Most budgets fail not because budgeting is bad, but because your average budget is nothing more than a page of lies. Sounds harsh? Not really. When most people sit down and decide that a budget is necessary, they take out a piece of paper and write down how they would like to spend their money. This wish list does not take into account their real financial life. It doesn't account for the pocket change and fun money that is spent on incidentals or even those regular expenses that were simply overlooked.

The best thing to do at the start of the budgeting process is to track all of your expenses for thirty days, no matter how big or how small. Write down the amount each time you spend money on lunch during the work week, whether it's lunch altogether or buying a cool drink to go along with one you brought from home. You even need to account for buying a pack of bubblegum or a candy bar. It may not be much, but it still costs you money. Track the amount of money you spend on taxi fares, and see how much you spend in a typical month with all of the different places you need to drive.

Each time you go out to the grocery store, track what you are spending. Even though something is a necessity, it still costs money. You have to be sure you know precisely what it's costing you. Take the time to look at your grocery account and make sure that you're taking advantage of the entire sale prices offered.

Plan your trips carefully, map out each need so that you can stay within your ideal price range. Impulse shopping at the grocery store is just as dangerous as impulse shopping anywhere else. In fact, a lot of people do not even realize that they fall off the budget wagon when they are there. Since it is so much easier to rationalize something as a necessity (even when you don't really need those extra desserts or pizza pies that are on sale), you can find your grocery accounts skyrocketing. It is very important to make a list and stick to it when you are at the grocery store, or you will find yourself in money trouble.

A lot of people buy small things at convenience stores on their way to work. They figure that the extra Rand or two for a doughnut and coffee in the morning doesn't really count against them. Guess what? It still costs you money. Even if you stop for a generic cup of coffee and a doughnut at your local deli, it will still cost you about ten Rands for that little indulgence. Multiply that by five. That's fifty Rands a week for which you didn't account, which would work out to two hundred Rands in an average month. Do you still think that stop for a quickie breakfast is something you can ignore?

As an important side note, remember that even if you are making a purchase on credit, you are still spending that money. The cash may still be in your bank account at that moment, but for all intents and purposes you have spent it and need to account for it as an expense. That money is still going to come out of your account when the credit card account arrives.

Your goal is a balanced budget that will help you minimize costs, pay your accounts and save money for the future. You will need to use, plenty of tools in order to make your plan work.

- The first tool is your own hard work and dedication.
- The second tool is knowledge, of your own spending needs and habits.

After you construct your budget, the next step is to make sure that it works. As time goes on, a lot of people find that they overestimated one expense and underestimated another. More often than not, when first attempting to make a working budget, they figure that certain expenses are a lot lower than they actually are. Once they find out that they are spending more than they initially thought, they have to go back and work with the figures to make them right. That's okay. Nobody is going to make the figures perfect on the first try. It might take a couple of tries to make a budget that truly reflects your lifestyle.

If that's the case, then don't be afraid to adjust the budget to reflect the actual costs of your day-to-day living expenses. It cannot be stressed enough that you need to account for everything in your daily routine. The more detail you put into your plan, the more complete the picture is and the fewer surprises you will have along the way. If you are eating steaks for dinner but your ledger says you are paying for a can of beans, then your budget plan will do you no good.

When you look at your accounts at the end of the month, you will have a hard time figuring out why you seem to be spending forty dollars more each week on food than you projected. A budget is a living document, meaning that it is a document meant to reflect how you truly live. Make a change if you need to make one. There is nothing worse than starting down the road, just to realize you've got the wrong map.

Conversely, you may need to change a part of your lifestyle that is costing you more than it should. You may find that you need to go out to fewer movies or go out to eat a little less. Maybe you do need to look at your situation and find a cheaper alternative to steak dinners. Maybe you would be better served by making pasta a few nights a week. Maybe you need to rely on groceries more than eating out. Even fast food, cheap as it is, is the type of expense you may need to cut back on to make your budget work. Just like anything else, it costs you money.

It feels great to have a detailed map to your destination laid out, but unless you follow it you are still going to get lost. Work with it and it will work for you.

My Notes …

ACTIVITY

Please complete Activity **1:**

Discuss and complete

(a) Individually, reflect on this question and discuss in your groups and identify three or more sources of money.

Where does your money come from?

(b) How do you plan to distribute your money at the end of the month? Discuss and identify items you plan to spend money on?

(c) List all the things you spend your money on when you earn salary at the end of the month and write the amounts you spend on each one of the items.

Use the table below for recording

Item	Expected amount

The table above will serve as a base for your expenditure plan.

(d) How much is your expenditure plan costing you if your net salary is R900, 00 per month?

(e) List and compare your expenditure plan with other members within your group.

(f) Discuss whether your net salary can cover afford your expenditure plan.

ν **A Sample Budget**

You can add and subtract to your heart's desire, both figures and categories, but this sample should give you a basis to build on. Budgeting is always a matter of adjusting your plan to make the most of what you have.

Savings	35
Regular savings: R25	
Emergency savings: R10	
Food	280
Groceries: R200	
College lunches: R80	
Accommodation	200
Utilities	90
Electricity: R30	
Paraffin: R20	
Cell phone: R40	
Clothing	35
Buying other clothes: R30	
Dry cleaning, zippers, thread, etc.: R5	
Medical	40
Optometrist: R10	
Other; hospital, medicine, doctor: R30	
Entertainment	20
Transportation (Taxi , Train, Bus)	180
Church or other organization	20
Total	900

Expenses can be divided into three categories:

- Fixed expenses

  Stay the same every month e.g. accommodation

- Variable expenses

  Can change from one month to the next e.g. groceries

- Irregular expenses

  Come up in some months but not in others e.g. medical expenses or buying a new television set.

ACTIVITY

Please complete Activity **2.1-2.4:**

Activity 2.1

You still earn R900, 00 per month. Plan how you would distribute and allocate this amount according to your expenses over one month.

Use the table below to allocate your money accordingly.

Income R900, 00

Item	**Amount**	**Outstanding amount of debt**	**% of total expenditure**
Pay for accommodation			
School fees			
Food and cleaning detergents			
Electricity			
Transport			
Medical expenses			
Insurance			
Burial Society/ Stokvel			
Entertainment			
Savings			
Overdraft			
Clothing account			
Total expenditure			
Total Income			100%
Shortfall/ variance			

a) Is your monthly net salary enough to cover your living expenses? If not, what should you do to live within your means?

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b) Assume prices will go up by 10% next month on all items. Calculate the new cost of after the increase. Decide which items might have to be cancelled.

Item	**Amount**	**New cost after 10% increase**	**% of total expenditure**
Pay for accommodation			
School fees			
Food and cleaning detergents			
Electricity			
Transport			
Medical expenses			
Insurance			
Burial Society/ Stokvel			
Entertainment			
Savings			
Overdraft			
Interest on overdraft			
Clothing account			
Furniture account			
Total expenditure			
Total Income			100%
Shortfall/ variance			

Which items must be cancelled?

____

Activity 2.2

a) Use the information gathered in 2.1 to draw up your personal budget

Item	**Amount**
Total	

b) Discuss in your groups and identify cost items that you would/can reduce cost on to live within your current net salary.

c) Assign a team member as a spokesperson to report back your plan to the entire group. You can note the main points below.

Activity 2.3

Suppose *ESKOM* has increased tariffs by 3% and *TELKOM's* tariffs have increased by 5%.

a) If you were spending R350,00 on electricity, calculate the amount you will spend on electricity based on the new tariffs.

b) If you were spending R250,00 on telephone, how much will you spend now based on the percentage increase?

Activity 2.4

Jabulani grows vegetables, which he sells at a market in the nearby village. The table below contains a list of his expenses and income.

Fertilizer	R50.00
Water	R37.50
Vegetable seeds or seedlings	R24.64
Money from vegetable sales	R206.56
Rent for the stall at the market	R70.00

a Calculate Jabulani's expenses and income.

b Does Jabulani make a profit from selling his vegetables? If so, how much profit does he make?

c Calculate Jabulani's profit margin.

- **Separate Needs and Wants**

As you are holding that prized piece of sale merchandise in your hand, ask yourself, "Do I need this?" There is a big difference between what you want and what you need.

There once was a man who believed that he needed a big-screen television. He worked hard and put in many hours at the office, and in his thoughts it was his right to come home to a big television that delivered a truly theatrical experience. He felt he needed that extra mile to get true relaxation. It never even crossed his, or his wife’s; mind that perhaps they needed to take care of some other obligations first. And so they spent his hard-earned bonus check on that television, and soon started getting phone calls from creditors curious as to why they were not getting the payments they were promised.

Not to pass judgment, but wouldn't that money have been better served toward taking care of payments that needed to be made instead of toward a new television? As time went by, the mortgage payment, which was about the same cost as that of the big-screen television, fell behind. The mortgage company had been promised that payment long before the television came along. They did not care about his superior picture quality and sound, they wanted their money. That's pretty fair. After all, it was their money that paid for the house — he was just paying it back.

There are plenty of other stories of people who decide they saw the best sale on clothes, shoes or furniture, and they just could not wait. That new couch would have looked wonderful in the living room, but when they got caught up in the rush of the purchase they forgot that there were six accounts waiting at home for them. Those six creditors didn't care how that couches looked; they wanted their money, which they had been promised. The utilities wouldn't be very understanding as to why they could promise to pay for the couch, but not the bill for their services.

It's easy to get caught up in the rush to stay ahead of the Joneses. That's what ad companies are paid to do; they are working hard to have you confuse want and need. It's how the company for which they advertise makes its money, so that they can continue to pay for such clever advertising. We are bombarded with advertising that practically commands us to keep up with the Joneses, whoever they are. Just remember that the people in those commercials didn't have to pay for the new satellite television system, new stereo system or new sofa set. They were just paid to show you how happy you should be if you own them.

Both your money and you will be best served by prioritising your accounts and purchases. Evaluate everything carefully and assess whether it is something you want or something you need. Buy the television if you can afford it. Upgrade your sound system if it won't risk your phone payment. But if your budget is telling you that you won't be able to pay for your groceries when you buy that new leather easy chair, then listen to the budget and wait until you have the money saved for it.

Avoiding the impulse to purchase will also allow you time to assess whether what you are buying is truly a need or a want. You will find that things can be much more satisfying if you take care of your needs first and know that your wants won't break the bank.

- **Remember to Save — Anticipate the Unexpected Costs**

Even more important than being prepared for a power outage is being prepared for the surprise expenses that occur. It's amazing that people think to have emergency reserves of water, batteries and food, but it does not occur to them to have emergency reserves of money. No matter what the amount, you should set aside money from every pay cheque to build an emergency reserve that you can dip into for those unexpected costs that inevitably come your way.

There are any of a number of unexpected situations that end up costing us a quite a bit of money. If you do not take the time now to save for those moments, you will find your well-laid budget plans derailed and you will be sent back to the drawing board when the slightest financial hurdle shows itself. Part of adequate planning is planning for everything that might happen, not just what we know will happen.

What if you tear your suit jacket and need to have it repaired? That is going to cost money. What if your computer needs to be repaired or replaced? In today's world, it's virtually impossible to exist without computer access. Yet things can and do go wrong with computers, and you will need to be able to pay to take care of it. What if you need new brakes or suspension work on the car? As they say, you cannot put a price tag on safety. Unfortunately, your mechanic can.

This is why it is so important to set aside extra money now. Even if it is only a little each week (or each pay cheque), even that small amount can build into a big cushion to soften the unexpected blow. Decide on an amount and work it into your budget. Even if it is only five Rands a week, when your tire goes flat, you'll be glad you did it.

1.2 Company budgets

The main steps in company budgetary control is process as follows:

- Definition of objectives
- Allocation of responsibilities for achievement of objectives
- Statement of policies and strategies necessary to achieve the objectives
- Budget preparation – calculation of likely results
- Budget approval
- Implementation of policies and strategies

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- Measurement of progress – actual performance versus budget
- Revision of policy to reflect actual conditions and new circumstances.

Before going into the process of preparing budgets, it is worth spending a little time considering how the whole planning and budgeting process fits into a company structure.

The Planning Process

There are several different approaches a company can use in planning for the future. The approaches are normally distinguished by the length of time covered, and can therefore be categorized as:

- Long-term plans
- Medium-term plans
- Short-term plans.

So, what is meant by these terms?

There is no universal definition of the time span covered by each of these categories. However, the long- and medium-term plans may be known as corporate or strategic plans. The use of such plans depends on a number of factors including:

- The type of business
- The markets served by the business
- The need for decisions regarding future events and products
- The importance placed by management on planning as a management tool.

The purpose of each type of process is as follows:

Long-term planning

Long-term planning is an exercise aimed at assessing future socio-economic and business trends for periods of up to twenty years. It is important to be aware of these trends in order to determine strategies, which will sustain company growth and meet corporate objectives in the long term.

Let us look at the example of a group of sugar farmers on the KwaZulu-Natal South Coast. As a group they decided to change from sugar farming to tea farming. They projected that in the long term it would be more profitable to farm tea. As a group they drew up a plan, which envisaged that, all farmers in the group would have switched over to tea within a period of say 10 years. It was very important for them to do their research properly because they had to be very sure that the market for tea would still exist long into the future.

Conversion from sugar cane to tea is a complicated process because the land has to terrace. Remember that the KwaZulu-Natal South Coast is very hilly, which is fine for the contour farming of sugar cane. Tea needs to be planted on flat ground, the land has to be levelled which is a major expense.

Tea bushes have to be a few years old before the first harvest, which means that farmers would have reduced income for a while. Their long-term plan involved the building of a processing and packaging plant, another major expense. The farmers very carefully worked out a plan, which involved each farmer converting a certain percentage of their farms to tea each year.

In this way they could still make a profit from sugar. By the time the first tea bushes were ready to be harvested the processing plant would be up and running, and there would be enough tea from all the farmers together to sell. They would also need to train labour for the planting and picking.

In comparison to the farmers, the microcomputer software industry changes so quickly that long-term plans have very little effect.

- **Medium-term planning**

Medium-term planning is a more practical exercise and normally spans two to five years. It is more practical because the closer we are to the present day, the fewer assumptions have to be made, and the probability of the plan reflecting what actually happens is much greater.

The medium-term plan will reflect the outline strategies developed in the long-term plan, but concentrate on the major decisions necessary in the next two to five years. In the case of the sugar/tea farmers, each farmer would make his own medium-term plan. This would involve which parts of the land to convert first, where to obtain the bushes, the expense of the bushes, where to get the machinery to convert the land, what type of fertiliser to use etc.

- **Short-term planning**

Short-term planning or budgeting normally covers a period of a year, and, unlike the others, may be subject to revision within that year. Because it deals with the immediate future, it is subject to much more certainty and can provide a detailed statement of intent. Each farmer would now do his planning for the year. Remember that he had already decided which lands to convert first in his medium term plan. He will now decide to convert his land immediately after the first sugar cane harvest of the year. He will make a note to hire bulldozers at that time. He makes a list of the amount of fertiliser that he needs to purchase. He places his order for the correct number of tea bushes. He works out how he can best allocate the labour that he has available. He works out how best he can irrigate the delicate new bushes and makes a list of the irrigation equipment that has to be bought. Short-term plans are therefore produced in much more detail than the others.

1.3 The budgeting process

The farmers formed a company. Together they drew up an overall budget. Each farmer then went back home and worked out his own budget to see how best he could effect the conversion. If each farmer draws up his own budget he will be much more committed to the long-term process.

The budgeting process must demonstrate a number of features in order for it to achieve its full use. First of all, it must be relevant to each farmer concerned. To do this, it must be available to each farmer. It must also portray the planned activity accurately. In some cases, budgets need to be flexible order to take account of changed circumstances (e.g. weather) during the budget period.

The budgeting process involves a series of consecutive events – the process cannot commence until the policy for future development is agreed – so the process itself needs to be planned. A flow chart of the major elements in a typical budgeting process is shown in the next page.

- **The elements of planning applied to budgeting**

Goal	To predict organization outputs, costs, and needs from other organizations
"What" and "How"	Defining the organization's work: inputs, activities, outputs, output dictators, and cost drivers Planning continuous performance improvement
"When" and Milestones	Schedules of inputs, activities, and outputs
"How Much"	Costs and needs from other organizations
"Why"	Justification of activities and costs
Assumptions	Explicit budgeting assumptions
Contingency Plans	Generally implicit – part of getting the budget approved

1.4 Profit

Zora needs to work out how much profit a certain field planted with potatoes will generate in one year. To do this calculation he needs to understand the terms income, expenses and profit.

In this case it is the money that he will be paid for the potatoes when he sells them. He has worked out that he will get R10 000 for his crop.

He has worked out that he must pay R6 000 for fertiliser, pesticides, labour, watering, hiring of a tractor, and sacks to pack the potatoes into once they are harvested. Remember that expenses are divided into fixed and variable expenses.

Profit is calculated as follows: Profit = income – expenses. Zora's profit is R10 000 – R 6 000 = R4 000

Profit Margin = Profit / Expenses x 100%

Zora's profit margin = 4 000 / 6 000 x 100 = 66,67%.

Income	Income is the money that will come in.
Expenses	Expenses are the money that he has to pay in order to be able to grow his crop.
Profit	Profit is the money that he has left over once the expenses have been paid.
Profit margin	Profit margin is the profit left after expenses have been paid expressed as a percentage of the expenses.

Concept (SO 1)	**I understand this concept**	**Questions that I still would like to ask**
Plans describe projected income and expenditure realistically.		
Calculations are carried out using computational tools efficiently and correctly and solutions obtained are verified in terms of the context.		
Budgets are presented in a manner that makes for easy monitoring and control.		
Actual income and expenditure is recorded accurately and in relation to planned income and expenditure. Variances are identified and explained and methods are provided for control.		

Session 2 Use simple and compound interest

After completing this session, you should be able to:
SO 2: Use simple and compound interest to make sense of and define a variety of situations.

In this session we explore the following concepts:

- Interest rates.
- Types of compounding.
- Nominal interest rate.
- Commission.
- Appreciation.
- Depreciation.

2.1 Interest rates

An interest rate is the 'rental' price of money. When a resource or asset is borrowed, the borrower pays the lender for the use of it. The interest rate is the price paid for the use of money for a period of time. One type of interest rate is the yield on a bond.

When you deposit your money in a bank, you are giving the bank permission to use the money for a specific period of time. You do this in exchange for an expected increase in future income. The expected increase in income (relative to the amount loaned) is the interest rate.

In finance, interest has three general definitions.

Definition

Interest	Interest is a surcharge on the repayment of debt (borrowed money). Interest is the return derived from an investment. Interest is the right to claim in a corporation such as that of an owner or creditor.

This learner guide covers the first definition listed above.

2.2 Types of compounding

The method by which interest accumulates generally falls in one of the following two categories:

ν **Simple Interest**

Simple interest is the method in which outstanding balances grow linearly with time. In each period, the total balance grows by some fraction of the principal (that is, of the original investment).

Simple interest is seldom used in practice, mostly for estimating compound interest in short durations.

When doing interest calculations, we identify the following:

- P = the principal amount (in Rands) is the amount of money you are borrowing from the bank, or which you are investing.
- A = the accrued amount (in Rands) is the end amount.
- r = the interest rate expressed as a decimal (e.g. 13% = 13/100 = 0,13)
- n = the time span of the investment.

If you are calculating how much money you will have at the end of a certain time of investing it at simple interest, the formula is as follows:

- A = P + (Prn)
- The actual interest that you earn is calculated by:
- *I = Prn*

Example

Example 1:
Calculate the interest on R600 at 7.5% per year, for 10 months.

Always make a list of the information given to you. Then you cannot go wrong.

Information I =? P = R600 R = 7,5% = 7,5/100 = 0,075 N = 10 months = 10/12 years = 0.83 years	Calculation I = Prn = 600 x 0,075 x 0,83 = R37.50

Example 2:
Thabo invests R2 000 at a rate of 12% p.a. simple interest. How much will he have all together at the end of 5 years?

Information	Calculation
A =? P = R2 000 R = 12% = 12/100 = 0,12 N = 5 years	A = P + Prn = 2 000 + 2 000 x 0,12 x 5 = R3200

- ### Compound Interest

Compound interest is the method in which outstanding balances grow exponentially with time. In each period, the total balance grows by some fraction of the sum of the principal and the interest paid on all previous periods.

With compound interest, the frequency of compounding influences the total amount of interest paid over the life of the loan. The accumulation function for compound interest is an exponential function in terms of time.

Suppose you invest a principal of P at an interest rate of r (given as a decimal) per year. Consider what happens when interest is compounded.

At the end of year 1, the interest earned will be $P\,r$ which will be added onto the original principal of P to give $P + P\,r = P(1 + r)$.

At the start of year 2 we start with $P(1 + r)$. By the end of year two this too will become multiplied by $1 + r$ to give $P(1 + r)(1 + r) = P(1 + r)^2$.

The general formula for the value at the end of the nth year of principal of P, invested at an interest rate of r, is

$A = P(1 + r)^n$

Example:
Let's say you invested R1500 at an interest rate of 5% over 6 years. What would the investment increase to?

Information	Calculation
A =? P = R1500 R = 5% = 5/100 = 0.05 n = 6	A = P (1 + r)^{n} = 1500 (1 + 0.05)^{6} = 1500 x 1.05 x 1.05 x 1.05 x 1.05 x 1.05 x 1.05 = R 2 010.14

2.3 Nominal interest rate

This is one of the greatest misnomers in economics. If real interest rate is the real rate of interest, the nominal interest rate is not the real thing. In fact it is the sum of the expected real interest rate plus the expected inflation rate over the duration of the loan. It's adding apples and pears. Nominal interest rate is not an interest rate at all, but the sum of two different concepts in economics.

- **Adding more Uncertainties**

When comparing interest rates, nominal interest rates and effective interest rates have to be distinguished. An interest rate is called nominal if the period of time after that the interest is credited (e.g. a month) is not identical to the basic time unit (normally a year).

Example:
Let's assume an annual interest rate of 6%, which is credited after each month. This means that an interest of 6% / 12 = 0.5% is credited every month. After one year, the initial capital is increased by the factor $(1+0.005)^{12} \approx 1.0616$. As a result, this nominal interest rate is equivalent to an effective interest rate of 6.16%.

2.4 Commission

A commission is a fee or allowance given to a sales person or agent in exchange for services rendered, often some percentage of the sales s/he is responsible for.

Example:
Assume your commission is 25% of sales. Your sales were R2000, 00. What is the value of the commission owed to you?
Commission = 0.25 * 2000
= 500

2.5 Appreciation

Appreciation is a term used in accounting relating to the increase in value of an asset. In this sense it is the reverse of depreciation.

In times of high inflation, appreciation will be common to all balance sheet assets. Generally, the term is reserved for property or, more specifically, land and buildings.

In any viable modern economy, such property tends to increase in value over the years – if only because of the scarcity of usable land forces its price in a competitive situation.

Example

Example:
You bought a house for R90 000. The value of your house appreciates at 10% per year. How much is your house worth after 1 year and after 3 years?

Information	Calculation
A =? P = R 90 000 r = 10% = 10/100 = 0,1 n = 1 year	$A = P\,(1 + r)^{n}$ $= 90\,000\,(1 + 0{,}1)^{1}$ $= 90\,000 \times 1{,}1$ $= 99\,000$
A =? P = 90 000 r = 10% = 10/100 = 0,1 n = 3 years	$A = P\,(1 + r)^{3}$ $= 90\,000\,(1 + 0{,}1)^{3}$ $= 90\,000\,(1{,}1)^{3}$ $= 119\,790$

2.6 Depreciation

Depreciation is an estimate of how much a certain item loses in value each year. We use the same formula as for compound interest, but because the tractor is losing value, it becomes a – (minus) sum.

Example

Example:
You buy a tractor for R240 000. The tractor loses its value by 10% a year and you want to know how much the tractor will be worth in 5 years time.

Information	Calculation
A =? P = 240 000 r = 10% = 10/100 = 0,1 n = 5 years	$A = P\,(1 - r)^{n}$ $= 240\,000\,(1 - 0{,}1)^{5}$ $= 240\,000\,(0{,}9)^{5}$ $= R141\,717{,}60$

ACTIVITY

Please complete Activity **3.**

1. Calculate the interest amount for each of the principals for the stated simple interest rate and time period:
   a. R500, 00; 7% per year; 1 year
   b. R500, 00; 24% per year; 3 months
   c. R1000, 00; 8% per year; 1 year
   d. R200, 00; 12% per year, 18 months
2. Let's say you invested R2 000,00 at an interest rate of 6% over 5 years. What would the investment increase to?
3. A credit card holder has owed the credit card company R200, 00 for a month and receives an account containing an interest charge of R3. Find the interest rate.
4. Assume your commission is 30% of sales. Your sales were R5000, 00. What is the value of the commission owed to you?
5. You bought a house for R150 000,00. The value of your house appreciates at 15% per year. How much is your house worth after 2 years?
6. You bought a tractor for your farm for R140 000,00. It depreciates by 15% per year. How much will the tractor be worth in 7 years time?
7. You plan to invest R10 000 in a bank. Which will give you a higher return:
   a) Investing at 14% compounded twice a year or
   b) Investing at 13,5% compounded annually.
8. How can you achieve improvements in productivity?
9. How can an organization in the short term, improve productivity through its employees?
10. What are the key elements of productivity?
11. What impact will HIV/AIDS have on productivity?
12. Given the following table answer the questions to follow.

My Notes ...

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Table 3.1 National budget revenue, 2003/04 estimates and audited outcome			
R billion	Budget estimate	Revised estimate	Audited outcome
Taxes on income and profits	181,5	176,0	175,9
Persons and individuals	97,3	98,9	99,2
Companies	66,6	61,5	61,7
Secondary tax on companies	8,0	6,0	6,1
Other	9,6	9,6	8,8
Taxes on property	5,9	6,5	6,7
Domestic taxes on goods and services	109,6	110,6	110,2
Value-added tax	81,0	81,0	80,7
Specific excise duties	11,4	11,7	11,4
Levies on fuel	16,3	16,4	16,7
Other	0,9	1,5	1,5
Taxes on international trade and transactions	11,3	8,8	8,4
Stamp duties and fees	1,8	1,5	1,4
Total tax revenue	310,0	303,3	302,5
Non-tax revenue and repayments	4,2	6,7	6,6
Less: Southern African Customs Union payments	-9,7	-9,7	-9,7
Main budget revenue	304,5	300,3	299,4

(a) What percentage (based on budget estimate) does taxes on income and profits make of the main budget revenue?

(b) What percentage (based on budget estimate) of domestic taxes on goods and services is allocated to VAT?

13. What is Ad valorem tax?
14. What is VAT?
15. What is income tax?

How am I doing?

Concept (SO 2)	I understand this concept	Questions that I still would like to ask
The differences between simple and compound interest are described in terms of their common applications and effects.		
Methods of calculation are appropriate to the problem types.		
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.		

My Notes ...

Session 3 Aspects of national and global economy

After completing this session, you should be able to:
SO 3: Use mathematics to debate aspects of the national economy.

In this session we explore the following concepts:

- Productivity.
- Impact of HIV/AIDS.
- Tax.
- Defining tax terminology.
- Distribution of wealth.

3.1 Productivity

A simple way of looking at productivity in a business organization is to think of it in terms of the productivity model below.

Essentially, productivity is a ratio to measure how well an organization (or individual, industry, country) converts input resources (labour, materials, machines) into goods and services.

This is usually expressed in ratios of inputs to outputs. That is (input) cost per (output) good or service. It is not on its own a measure of how *efficient* the conversion process is. The *Productivity Conceptual Model* below takes the form of a 'productivity tree'. The roots denote the inputs to the system, the trunk the conversion process and the leaves and fruits the system's outputs.

My Notes ...
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Productivity Conceptual Model

Improved Services

Better delivery, better quality, better output.

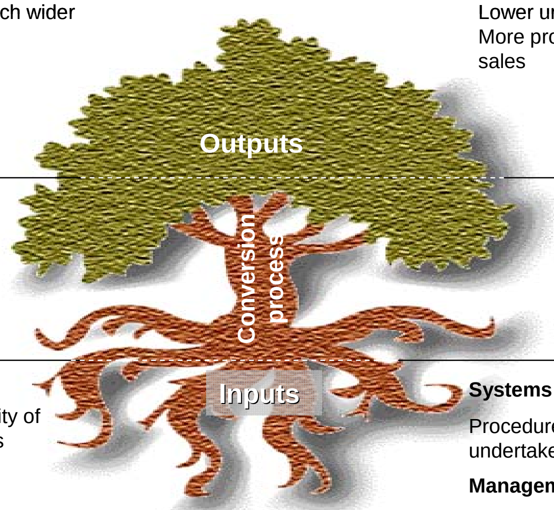
Better benefits to customer.

Increased Volume

Able to reach wider market

Reduced Costs

Lower unit cost.
More profit or more sales



Materials

Quality, quantity of input materials

Tools

To undertake the work efficiently

Skill

Trained and developed for the purpose

People

Correct skill levels, age mix

Knowledge

People with experience and expertise in the appropriate areas of the business

Systems

Procedures to ensure organisation can undertake conversion process efficiently

Management

Skill, ability and leadership style.

Right calibre and competence.

Attitudes

Ability to adapt, cooperate, change. Resourcefulness and motivation

The successful management of this process is ultimately the key to survival of any organization. It should be the concern of, and a development goal for all organizational members, irrespective of their position.

ν **How productivity is improved**

Improvements in productivity can be achieved by:

♥ Achieving more output for the same input

♥ Achieving the same output from less input

♥ Achieving much more output form slightly more input

♥ Getting slightly less output for much less input

There are six lines of attack to improve productivity ratio of an organization, namely:

- Improve basic process by research and development (long term)
- Improve and provide new plant, equipment and machinery (long term)
- Simplify product and reduce variety (medium term)
- Improve existing methods and procedures (short term)

- Improve the planning of work and the use of manpower (short term)
- Increase the overall effectiveness of employees (short term)
- In the short term, an organization can improve productivity through its employees by:
- Properly motivating and coaching its employees
- Providing the right information at the right time to its employees,
- Using simple productivity improvement tools and techniques and
- Rewarding employees in a an appropriate way

Key elements of productivity

The following are the key elements of productivity:

- The Outcome of productivity is Continuous Improvement of Performance;
- The Improvement must be Measurable;
- Key drivers of productivity are:
  - Effectiveness (Doing the right things)
  - Efficiency (Doing things the right way)
  - Utilization (Optimum use of human capital and physical resources)
  - Elimination of all forms of waste
  - The beneficiaries of productivity must be the:
  - Environment
  - Economy, and
  - Society

3.2 Impact of HIV/AIDS

The facts

- Over 40 million adults worldwide are currently HIV positive.
- Sub-Saharan Africa accounts for 70% of global HIV infection.
- There are around 4.7 million HIV infections in South Africa at present but ING Barings estimates 6 million and University of Cape Town actuarial science models indicate 5.35-5.4 million currently living with HIV/AIDS rising to as many as 6.5-7.0 million over the next ten years.
- According to the United Nations, South Africa has more people living with HIV/AIDS than any other country in the world.
- 1800 new infections occur each day.
- Based on Ante-Natal Clinic Survey results it can be assumed that at least 24.5% of South Africa's sexually and economically active population are already HIV+.
-

- The Actuarial Society of SA estimates that the population growth rate declined from 2% in 1999 to 1.9% in 2000 and the growth rate was projected to drop to 0% in 2011.
- Aids-related deaths will climb from around 400 000/year now to between 800 000 and 1m/year, cutting average life expectancy from 68 to 48 years with some predictions indicating 38 years by 2010.
- The proportion of adult deaths related to AIDS has increased from less than 10% in 1995 to 40% in 2000.
- Possibly nearly one in 10 South Africans now aged 20-40 could die by 2005 - by 2010 between 4million and 7-million South Africans will die from the disease.
- By 2010, more than 25% of the adult population will be HIV+, up to 7 million people.
- 25% of students at Durban Westville University tested HIV+ in late 1998 and a recent survey among technicon students estimated infection levels of around 25%.
- A 1999 study of miners in Southern Africa found that more than a third of employees in their late 20s and 30s were infected with HIV.

The impact

- The disease will affect a considerable percentage of the workforce, including decision makers.
- HIV/AIDS related sicknesses will directly affect productivity in the workplace and the competitiveness of South Africa's economy. This will also have a great effect on South African communities and families.
- As the disease depletes the labour force, especially when the skilled labour force is affected, the potential for economic growth is reduced potentially by up to 2% p.a. – latest BER scenario indicates GDP 5,7% lower by 2015 as a result of AIDS.
- Productivity and profitability are directly and negatively impacted by:
  - Absenteeism due to sickness and funerals.
  - Increase in Accidents.
  - Loss of skills and labour due to sickness, death and emigration.
  - Decrease in employee morale.
  - Industrial relations issues.
  - Increased costs.
- Human Development for the future is retarded:
  - Families fragment.
  - The number of orphans grows – estimates indicate one million Aids orphans under the age of 15 in South Africa by 2005, rising to 2.5 million in 2010.

- School Attendance declines as children are sent out to work or are left directionless.

♥ By 2005, 4 million families with incomes between R2500 and R8000/month will face a 20% reduction in discretionary spending as a result of higher taxation to fund state medical spending and increasing medical costs. (Janina Slawski, Governor of the Actuarial Society of SA's AIDS committee)

♥ In Zimbabwe, life-insurance premiums quadrupled in two years because of HIV/AIDS. (The Economist, A Global Disaster, 2 January 1999)

♥ Individual poverty grows, as government resources are increasingly re-directed to address the impact of AIDS with proportionally less finance available for other social expenditure including education.

ν **The economic consequences**

♥ During late 1998 the Vice President of External Affairs at the World Bank warned that South Africa is moving quickly from a country commanding a high level of interest among investors to just another market competing with other emerging markets.

♥ For long-term success, South Africans must work smarter, deliver more reliably, produce better quality and add greater value at lower cost than the countries against which we are competing.

♥ Growing foreign investment, higher savings, smaller and more efficient government, improved productivity and growing trust and confidence in South Africa in international markets are therefore the key to long term economic growth for the country.

♥ A Business Map investor survey released at end January 2002 found that the spread of HIV/Aids in South Africa has contributed significantly to the decline in foreign direct investment (FDI).

♥ Macroeconomic performance will be hard hit by HIV/Aids infection, resulting in a reduction in human capital and a negative impact on consumer spending, which will shift to health care and funeral expenses.

♥ The South African government is likely to suffer from larger deficits with increased public sector spending on health care resulting in lowered spending in other sectors like capital expenditure.

♥ The consequences, for business and the economy, of the HIV/AIDS epidemic include:

- Uncertainty among international investors – lower levels of fixed foreign investment.
- Lower productivity,
- Demoralized and sick management and workers,
- Labor disputes,
- Unstable quality,

- Erratic performance against production targets
- Erratic delivery,
- High absenteeism,
- High emigration of growth generating skills,
- Increasing Gov. debt (less tax income – higher social expenditure),
- Tourism retarded.

♥ These effects can destroy the economic future of South Africa with far reaching and potentially destabilizing political consequences.

♥ Africa and South Africa can only grow and prosper as part of a global economy which requires:

High levels of foreign investment, high productivity, high quality, high international trust and confidence, declining unit costs and high exports
equals
high growth, high job creation, social stability and economic prosperity.
An unchallenged aids epidemic will bring the opposite

ν **The indirect impact – a summary**

♥ Deterrent to foreign investment and low investment = low growth

♥ Consumer markets will suffer – by 2005, 4 million families with incomes of between R2 500 and R8 000/month will face a 20% reduction in discretionary spending as a result of higher taxation to fund State medical spending and increased personal medical costs (Janina Slawski, convenor of the Actuarial Society of SA's Aids committee.)

♥ Deterrent to long term individual motivation – wealth creation, career, etc

♥ Deterrent to personal savings accumulation compounds impact on investment

♥ Impact on competitiveness of country, firms and individuals – loss of skills (sickness, death and emigration), quality, reliability of supply, etc

♥ Impact on work ethic and motivation – absenteeism, motivation, etc

♥ Impact of growth and supply of human capital for the future, increasing number of orphans,dislocated families, interrupted and reduced levels of education, breakdown in transfer of traditions, morals, ethics and values.

ν **The impact on our youth**

♥ Household incomes decline as family members become less productive, lose jobs or have to stay at home to care for sick family members.

♥ Children are removed from school and sent to work to support families where breadwinning adults have lost jobs, are too ill to work or have died.

- Average age of death from Aids in Port Elizabeth 27 to 29 years old – indicating probable infection at 15 to 20 years of age.
- Destruction of young lives – no education, no jobs, no careers, no income, no families of their own.
- Number of orphans grows sharply.
- Family units, the foundation of society disintegrate.
- Crime, lawlessness and short term perspectives, even further promiscuity, are promoted.
- No cure exists or is likely to be developed for many years.

The only solution and option for personal safety is a
change in behavior
and every day lost is a tragedy for
thousands of individual young South Africans,
their families and for South Africa as a country.

3.3 Tax

South Africa, after a decade of fundamental reforms of its tax structure and improvements in revenue administration, has succeeded in broadening the tax base and reducing marginal tax rates. The revenue buoyancy of the tax structure has been enhanced, evidenced in the steady growth of gross tax revenue alongside progressive personal income tax relief since 1995.

Although tax reform has mainly focused on the income tax system, excise taxes have undergone simplification through the introduction of a more coherent specific rate structure for alcohol taxation, international benchmarking of the tax burdens on alcohol beverages and rationalization of ad valorem duties.

The 2005 tax proposals will take account of the changing global economic environment, competition amongst nations for foreign direct investment, a narrower tax compliance gap and a significantly stronger local currency. The period ahead will see consideration given to structural tax reforms relating to the mining sector, the retirement industry, protection of the environment and outstanding aspects of the tax treatment of financial services.

This year's aggregate revenue collection is expected to be marginally higher than the original budget estimate.

- **National budget revenue 2003/04**

The audited main budget revenue outcome of R299,4 billion for the 2003/04 fiscal year was R5,1 billion less than the original budget estimate of R304,5 billion, and marginally below the revised estimate of R300,3 billion published in the 2004 Budget Review. The main divergences in revenue were:

- R1, 9 billion more than estimated personal income tax revenue
- R4, 9 billion less than budgeted company tax revenue
- R2, 9 billion less than estimated international trade tax receipts, mainly due to lower rand values of imports than originally estimated
- R2, 4 billion more than expected in interest, dividends and other non-tax receipts.

The 2003 Budget also included an announcement of an exchange control amnesty, with accompanying tax measures. Proceeds of the exchange control levy have yet to be finalized.

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Taxes on income and profits	181,5	176,0	175,9
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Non-tax revenue and repayments	4,2	6,7	6,6
Less: Southern African Customs Union payments	-9,7	-9,7	-9,7
Main budget revenue	304,5	300,3	299,4

3.4 Defining tax terminology

- **Tax**

A tax is a compulsory charge or other levy imposed on an individual or a legal entity by a state or a functional equivalent of a state (e.g., tribes, secessionist movements or revolutionary movements). Taxes could also be imposed by a sub-national entity (province of local government).

Governments use taxes to build roads, schools, hospitals and other infrastructure. They also use taxes to provide services such as education, health, safety and security, etc.

- **Excise tax**

An excise is an indirect tax or duty levied on items within a country. It is an ad valorem tax on specific goods or a fixed rate tax on specific goods; in this manner it differs from value added tax.

Excise duties usually have one of two purposes, either to raise revenue or to discourage particular behavior. Taxes such as those on fuel, alcohol and tobacco are often justified on both grounds. But theoretical economics suggests that the optimal revenue raising taxes should be levied on items with an inelastic demand, while behavior altering taxes should be levied where demand is elastic.

- **Ad valorem tax**

An Ad valorem tax is a tax based on the assessed value of real estate or personal property. In other words ad valorem taxes can be property tax or even duty on imported items. Property ad valorem taxes are the major source of revenues for state and municipal governments.

An ad valorem tax is typically imposed at the time of a transaction (value added tax (VAT)) but it may be imposed on an annual basis (property tax) or in connection with another significant event (inheritance tax or tariffs). The alternative to ad valorem taxation is a fixed rate tax, where the tax base is the quantity of something, regardless of its price.

Ad Valorem is Latin for "According to value".

- **Income tax**

Income tax is commonly a progressive tax because the tax rate increases with increasing income. For this reason, it is generally advocated by those who think that taxation should be borne more by the rich than by the poor, even to the point of serving as a form of social redistribution. Some critics characterize this tax as a form of punishment for economic productivity.

The most effective way of collecting income tax is by deducting it directly from your salary. This works because most people in modern societies are salaried workers. This reduces the perceived burden of the tax, because employees never handle the money.

- **Value added tax**

A value added tax applies the equivalent of a sales tax to every operation that creates value. To give an example, a machine manufacturer imports sheet steel. That manufacturer will pay the VAT on the purchase price, remitting that amount to the government. The manufacturer will then transform the steel into a machine, selling the machine for a higher price to a wholesale distributor.

The manufacturer will collect the VAT on the higher price, but will remit to the government only the excess related to the "value added" (the price over the cost of the sheet steel). The wholesale distributor will then continue the process, charging the retail distributor the VAT on the entire price to the retailer, but remitting only the amount related to the distribution markup to the government. The eventual retail customer who cannot recover any of the previously paid VAT pays the last VAT amount.

3.5 Distribution of wealth

In economics, Distribution of wealth refers to the proportion of capital controlled by a given percentage of a population. Typically, a small percentage will control a larger percentage of available capital.

Globally, at the end of the twentieth century, the distribution of wealth is said to be concentrated among the G8 and Western industrialized nations, along with several pockets in Asia.

The political systems of socialism and communism are intended to diminish the perceived conflicts arising from unequal distribution of wealth. They did so by forcing wealthier members of society to surrender some or all of their assets to the majority in a process sometimes called wealth transfer. The State or the people then administer all public assets.

The former Soviet Union and The People's Republic of China are often criticized as examples of countries where, despite aggressive economic regulation, wealth continued to distribute unevenly, often among those in politically powerful positions.

In most countries, attempts are made through taxation, regulation and governmental oversight to at least diminish the natural economic tendency for capital (and therefore effective political power) to accumulate among small groups, often resulting in substantial political debate and controversy.

In the United States, 10% of the population owns 71% of the wealth. Looked at another way, if $100 were divided among 100 people in the same proportions as the wealth in the United States, one person would get $38.10, while at the bottom, 40 people would receive 1/2 cent each.

The following table was obtained from Statistics South Africa's census data from 2001. It contains the energy source for heating by population group of the household head.

Energy source for heating	Black African	Coloured	Indian or Asian	White	Total
Electricity	3 206 237	698137	274 996	1 313 651	5 493 021
Gas	75 318	7 551	1 899	40 214	124 982
Paraffin	1 604 625	31 061	1 323	4 448	1 641 458
Wood	2 623 607	116 402	1 336	17 516	2 758 861
Coal	718 054	8 132	742	7 527	734 455

Animal dung	80 975	897	152	1 033	83 058
Solar	19 998	920	296	2 296	23 509
Other	296 235	24 937	2 185	23 004	346 361
Total	8 625 050	888 036	282 930	1 409 689	11 205 705

When you start to do some calculations you will notice that the percentage split for the use of electricity is 58% black (3206 237/5493 021 x 100), 13% Colored, 5% Asian, and 24% white households. If you then look at the use of electricity per population group, you will find that 37% of black (3206 237/8625 050 x 100), 79% of colored, 97% of Asian, and 93% of white households use electricity as source for heating.

What do these figures tell you about the availability of electricity as a source for heating in households in South Africa?

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If you were the minister of energy in South Africa, what will you do based on the table above?

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What raw materials do we use for the generation of electrical energy in South Africa? Is there unlimited supply of this raw material? What are the negative effects of this method of generating electricity?

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Are we using renewable energy enough for heating purposes? Use the table for your answer.

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____

ACTIVITY

Please complete Activity **4:**
This activity will be done over **six months.** Keep accurate data of actual expenses and file your receipts as evidence wherever possible in your portfolio of evidence.

Descriptio	Sept 05	Oct 05	Nov 05	Dec 05	Jan 06	Feb 06

n	Budget	Actual	Budge t	Actual	Budge t	Actual	Budge t	Actual	Budget	Actual	Budge t	Actual
Total												

How am I doing?

Concept (SO 3)	I understand this concept	Questions that I still would like to ask
Values are calculated correctly.		
Mathematical tools and systems are used effectively to determine, compare and describe aspects of the national economy.		
Debating points are based on well-reasoned arguments and are supported by mathematical information.		

My Notes ...

Am I ready for my test?

- Check your plan carefully to make sure that you **prepare in good time.**
- You have to be found **competent** by a qualified **assessor** to be declared competent.
- Inform the assessor if you have any **special needs** or requirements **before** the agreed date for the test to be completed. You might, for example, require an interpreter to translate the questions to your mother tongue, or you might need to take this test orally.
- Use this worksheet to help you prepare for the test. These are **examples** of **possible questions** that might appear in the test. All the information you need was taught in the classroom and can be found in the learner guide that you received.

1. ***I am sure** of this and understand it well*
2. ***I am unsure** of this and need to ask the Facilitator or Assessor to explain what it means*

Questions	1. I am sure	2. I am unsure
1. Use mathematics to plan and control personal, regional and/or national budgets and income and expend		
2. Use simple and compound interest to make sense of and define a variety of situations		
3. Use mathematics to debate aspects of the national economy		

My Notes ...

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Checklist for practical assessment …

Use the **checklist** below to help you prepare for the part of the practical assessment when you are observed on the **attitudes** and **attributes** that you need to have to be found competent for this learning module.

Observations	Answer Yes or No	Motivate your Answer (Give examples, reasons, etc.)
Can you identify problems and deficiencies correctly?		
Are you able to work well in a team?		
Do you work in an organised and systematic way while performing all tasks and tests?		
Are you able to collect the correct and appropriate information and / or samples as per the instructions and procedures that you were taught?		
Are you able to communicate your knowledge orally and in writing, in such a way that you show what knowledge you have gained?		
Can you base your tasks and answers on scientific knowledge that you have learnt?		
Are you able to show and perform the tasks required correctly?		
Are you able to link the knowledge, skills and attitudes that you have learnt in this module of learning to specific duties in your job or in the community where you live?		

- The assessor will complete a checklist that gives details of the points that are checked and assessed by the assessor.
- The assessor will write commentary and feedback on that checklist. They will discuss all commentary and feedback with you.
- You will be asked to give your own feedback and to sign this document.
- **It will be placed together with this completed guide in a file as part of you portfolio of evidence.**
- The assessor will give you feedback on the test and guide you if there are areas in which you still need further development.

Paperwork to be done …

Please assist the assessor by filling in this form and then sign as instructed.

Learner Information Form				
Unit Standard	**7456**			
Program Date(s)				
Assessment Date(s)				
Surname				
First Name				
Learner ID / SETA Registration Number				
Job / Role Title				
Home Language				
Gender:	Male:		Female:	
Race:	African:	Coloured:	Indian/Asian:	White:
Employment:	Permanent:		Non-permanent:	
Disabled	Yes:		No:	
Date of Birth				
ID Number				
Contact Telephone Numbers				
Email Address				
Postal Address			Signature:	

Bibliography

- **Books:**

- Metropolitan Life/Institute for Future Research/Sunter, C.,
- The High Road: Where are we now? Tafelberg, Human & Rousseau Cape Town 1996
- Excerpt from the Address to the National Assembly on the tabling of the Medium Term Policy Statement, the Adjustments Appropriation Bill and the Revenue Laws Amendment Bill, by Minister Trevor Manuel (2004).

Terms & Conditions

Acknowledgements

- **Project Management:**

  M H Chalken Consulting

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- **Authenticator:**

  Ms C Almeida

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  Ms C Almeida

- **OBE Formatting:**

  Ms P Prinsloo

- **Design:**

  Didacsa Design SA (Pty) Ltd

- **Layout:**

  Ms A. du Plessis

  Ms N Matloa

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

REGISTERED UNIT STANDARD:

Use mathematics to investigate and monitor the financial aspects of personal, business and national issues

SAQA US ID	**UNIT STANDARD TITLE**		
7456	Use mathematics to investigate and monitor the financial aspects of personal, business and national issues		
SGB NAME	**NSB**	**PROVIDER NAME**	
SGB for Math Literacy, Math, Math Sciences L 2 -4	NSB 10-Physical, Mathematical, Computer and Life Sciences		
FIELD		**SUBFIELD**	
Physical, Mathematical, Computer and Life Sciences		Mathematical Sciences	
ABET BAND	**UNIT STANDARD TYPE**	**NQF LEVEL**	**CREDITS**
Undefined	Regular-Fundamental	Level 3	5
REGISTRATION STATUS	**REGISTRATION START DATE**	**REGISTRATION END DATE**	**SAQA DECISION NUMBER**
Reregistered	2004-12-02	2007-12-02	SAQA 1657/04

PURPOSE OF THE UNIT STANDARD

This unit standard will be useful to people who aim to achieve recognition at some level in Further Education and
Training or to meet the Fundamental requirement of a wide range of qualifications registered on the National
Qualifications Framework.

People credited with this unit standard are able to:

Use mathematics to plan and control personal and/or household budgets and income and expenditure.

Use simple and compound interest to make sense of and define a variety of situations including investments, stokvels, inflation, appreciation and depreciation.

Investigate various aspects of financial transactions including costs, prices, revenue, cost price, selling price, loss and profit.

LEARNING ASSUMED TO BE IN PLACE AND RECOGNITION OF PRIOR LEARNING

The credit value is based on the assumption that people starting to learn towards this unit standard are competent in Mathematics and Communications at NQF level 2.

UNIT STANDARD OUTCOME HEADER

Use mathematics to plan and control personal, regi

Specific Outcomes and Assessment Criteria:

SPECIFIC OUTCOME 1

Use mathematics to plan and control personal, regional and/or national budgets and income and expend

OUTCOME NOTES

1.1 Plans describe projected income and expenditure realistically.

1.2 Calculations are carried out using computational tools efficiently and correctly and solutions obtained are verified in terms of the context.

1.3 Budgets are presented in a manner that makes for easy monitoring and control.

1.4 Actual income and expenditure is recorded accurately and in relation to planned income and expenditure. Variances are identified and explained and methods are provided for control.

OUTCOME RANGE

Bank accounts, provincial and key elements of national budgets and tax.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

Use mathematics to plan and control personal, regional and/or national budgets and income and expenditure.

ASSESSMENT CRITERION NOTES

1.1 Plans describe projected income and expenditure realistically.

1.2 Calculations are carried out using computational tools efficiently and correctly and solutions obtained are verified in terms of the context.

1.3 Budgets are presented in a manner that makes for easy monitoring and control.

1.4 Actual income and expenditure is recorded accurately and in relation to planned income and expenditure. Variances are identified and explained and methods are provided for control.

ASSESSMENT CRITERION RANGE

Bank accounts, provincial and key elements of national budgets and tax.

SPECIFIC OUTCOME 2

Use simple and compound interest to make sense of and define a variety of situations.

OUTCOME NOTES

2.1 The differences between simple and compound interest are described in terms of their common applications and effects.

2.2 Methods of calculation are appropriate to the problem types.

2.3 Computational tools are used efficiently and correctly and solutions obtained are verified in terms of the context or problem.

2.4 Solutions to calculations are used effectively to define the changes over a period of time.

OUTCOME RANGE

Effective and nominal rates, commission, appreciation and depreciation.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

Use simple and compound interest to make sense of and define a variety of situations.

ASSESSMENT CRITERION NOTES

2.1 The differences between simple and compound interest are described in terms of their common applications and effects.

2.2 Methods of calculation are appropriate to the problem types.

2.3 Computational tools are used efficiently and correctly and solutions obtained are verified in terms of the context or problem.

2.4 Solutions to calculations are used effectively to define the changes over a period of time.

ASSESSMENT CRITERION RANGE

Situations include:

Effective and nominal rates, commission, appreciation and depreciation.

SPECIFIC OUTCOME 3

Use mathematics to debate aspects of the national economy.

OUTCOME NOTES

3.1 Values are calculated correctly.

3.2 Mathematical tools and systems are used effectively to determine, compare and describe aspects of the national economy.

3.3 Debating points are based on well-reasoned arguments and are supported by mathematical information.

OUTCOME RANGE

Tax, productivity and the equitable distribution of resources.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

Use mathematics to debate aspects of the national economy.

ASSESSMENT CRITERION NOTES

3.1 Values are calculated correctly.

3.2 Mathematical tools and systems are used effectively to determine, compare and describe aspects of the national economy.

3.3 Debating points are based on well-reasoned arguments and are supported by mathematical information.

ASSESSMENT CRITERION RANGE

Tax, productivity and the equitable distribution of resources.

UNIT STANDARD ACCREDITATION AND MODERATION OPTIONS

UNIT STANDARD ESSENTIAL EMBEDDED KNOWLEDGE

The following essential embedded knowledge will be assessed by means of the specific outcomes in terms of the stipulated assessment criteria. Candidates are unlikely to achieve all the specific outcomes, to the standards described in the assessment criteria, without knowledge of the listed embedded knowledge. This means that the possession or lack of the knowledge can be inferred directly from the quality of the candidate's performance against the standards.

Budgets.

Terminology and definitions associated with financial situations.

Estimation and approximation.

Compound increase and decrease.

Critical Cross-field Outcomes (CCFO):

UNIT STANDARD NOTES

N/A