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MATHEMATICAL LITERACY

GRADE 12

SPRING SCHOOL

TEACHER AND LEARNER CONTENT MANUAL

2026

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MATHEMATICAL LITERACY PROGRAMME FOR 2026 SPRING CLASSES

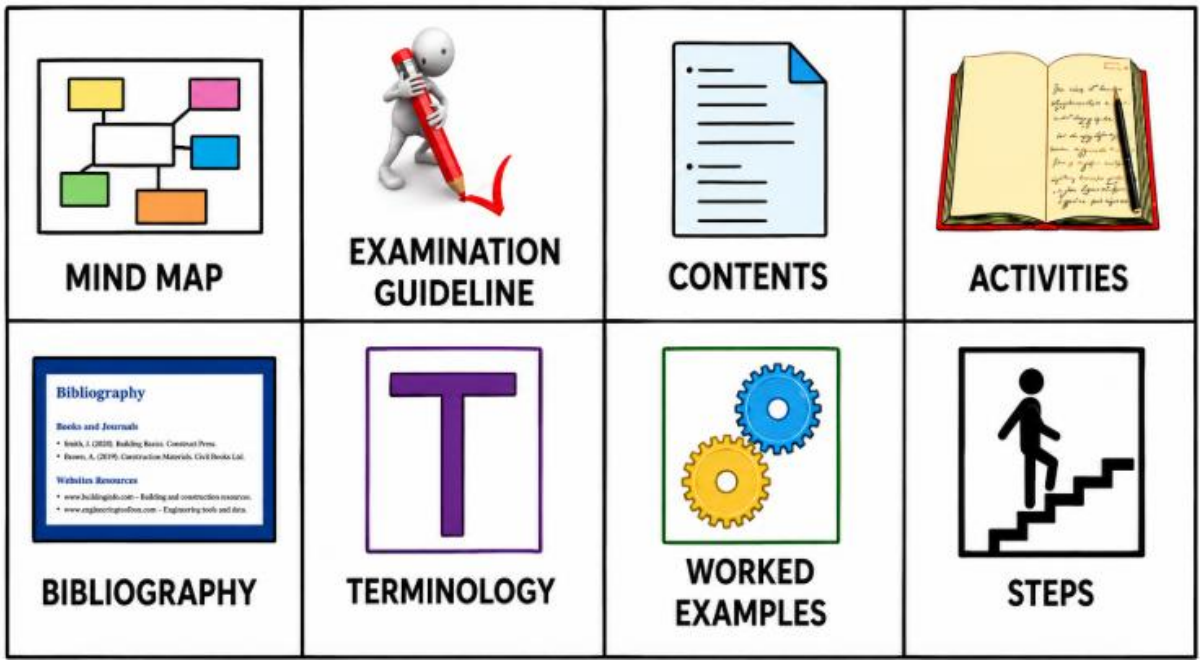
STRUCTURE OF EXAMINATION			
PAPER	**TOPICS**	**TOTAL MARKS**	**WEIGHTING**
PAPER 1: (FINANCE & DATA HANDLING)	**Finance**	**±90**	**± 60 %**
	Data Handling	±53	± 35 %
	Probability	**±7**	**5%**
TOTAL		**± 4**	**± 32%**
PAPER 2: (MEASUREMENT, MAPS, PLANS & SCALE)	Measurements	± 83	± 55%
	Maps, Plans and Scale	± 60	± 40%
	Probability	±7	± 5%
TOTAL		**150**	**±100%**

Pre-test and Post-test to be administered focuses only on interest, hire purchase, inflation, exchange rates, plans and packaging, BMI and probability

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ICON DESCRIPTION



LESSON OBJECTIVES

INTEREST

Learners must be able to:

OUTCOMES
1. Define and explain interest and understand its role in financial transactions. 2. Distinguish between simple interest and compound interest. 3. Identify key terminology associated with interest, including: • Principal/initial amount • Interest • Interest rate • Time period • Interest earned • Accumulated amount • Simple interest • Compound interest 4. Convert interest rates and time periods into appropriate units before calculating. 5. Determine the interest earned when the principal, interest rate and time periods are given. 6. Determine the principal, interest rate or time period when other information is provided. 7. Interpret financial information involving interest in real life situations such as savings, investments and loans. 8. Compare simple and compound interest and explain how they affect the total payable or earned. 9. Solve word problems involving interest and explain the meaning of the answer in context. 10. Apply interest concepts to real-life financial decisions making, such as choosing between savings or investment options.

What is interest?

Interest is the amount of money that you earn when you invest.

Interest is also the amount of money that you are charged when you borrow.

Simple interest

The interest remains the same

Compound interest
The interest increases constantly

Interest on interest

IMPORTANT TERMS AND DEFINITIONS

Term	Definition	Example
Interest	Money earned on savings from investing or money charged from borrowing	Interest on a saving account or Interest on borrowed amount
Principle amount (P)	The original amount invested or borrowed	R100 0000 investment
Interest rate (r)	Percentage charged or rate at which interest is calculated	8% per annum
Amount (A)	The value after interest has been added	The investment value after 3 years
Time (t)	Period for which money is invested or borrowed	3 years
Investment	Money deposited to earn interest	Fixed deposit
Loan	Money borrowed and repaid with interest	Student loan
Borrower	Person receiving borrowed money	Loan applicant
Lender	Institution or person lending money	Bank or Mashonisa
Per annum (p.a)	Per year	10% p.a
Accumulated amount	Total amount after interest is added	Principle + Interest

WORKED EXAMPLE [08 MARKS]

Mrs Brown invested R15 000 at ABFA Bank at a COMPOUND interest rate of 12% p.a.compounded yearly for 3 years. Calculate:

1. The interest that Mrs. Brown will earn after 2 years. (4)

POSSIBLE ANSWER:

First year: (12 ÷ 100) × R15 000 = R1 800

Second year: (12 ÷ 100) × R1 800 = R216 + R1 800 = R2 016

∴ Interest = R2 016 + R1 800 = R3 816

2. The total amount that Mrs. Brown will get after 3 years (4)

POSSIBLE ANSWER:

First year: (12 ÷ 100) × 45 000 = R1 800

Total = R15 000 + R1 800 = R16 800

Second year: (12 ÷ 100) × R16 800 = R2 016

Total = R16 800 + R2 016 = R18 816

Third year: (12 ÷ 100) × R18 816 = R2 257,92

∴ R18 816 + R2 257,92 = R21 073,92

ACTIVITY 1

Peter applied for a loan to the amount of R220 000 to further his studies and wants to repay the loan within 2 years as he got a part-time job at the university. He was offered the following options:

- **Option 1**: The interest of the loan is 9% per annum compounded annually.
- **Option 2**: The interest of the loan is charged at 10 % compounded half yearly.

1. Peter claimed that he will pay less interest if he chooses option 2. Show by means of calculations whether his claim in VALID. (7)

2. If he was investing that amount of money, which option would be advisable to choose? Explain (2)

[09]

ACTIVITY 2

1. A student approached ABC Loans to borrow money to pay his university fees for one year.

He applied for a loan of R46 000,00. ABC Loans have the following conditions:

- A once-off initial fee of R300.
- A monthly service fee of R38,00
- An interest rate of 10,75% compounded annually

The student stated that the total loan value will be R11 633,59 more than the original total amount if he paid it off over a 24-month period.

Verify, showing ALL calculations, If the student's statement is CORRECT (8)

Use information above to calculate the following:

2. Mr Williams wants to invest R12 000 for a period of 3 years at a rate of 0,55% per month simple interest.

2.1 Determine the annual interest rate. (2)

2.2 Calculate the interest earned at the end of the investment. (3)

[13]

HIRE PURCHASE

Term	Definition	Example
Hire Purchase (HP)	Hire purchase is a method of buying goods by paying a deposit and the balance in monthly instalments. Ownership is obtained after the final payment.	Buying a refrigerator on hire purchase
Cash price	The amount paid if the item is bought immediately with cash	A TV costs R8 000 cash
Deposit	An initial payment made before instalments begin	A 10% deposit on a R10 000 item is R1 000
Balance owing	The amount remaining after the deposit has been paid	R10 000 – R1 000 = R9 000
Instalment	A regular payment made over a specific period	Paying R500 per month
Monthly instalment	The amount paid each month towards the debt	R750 per month for 24 months
Credit	An agreement allowing a person to buy now and pay later	Purchasing furniture on credit
Interest	The extra money charged for borrowing money	Interest added to the balance owing
Simple interest	Interest calculated only on the original amount borrowed	Interest remains the same
Interest rate	The percentage charged on the borrowed amount	12% per annum
Principle amount	The original amount borrowed before interest is added	R9 000 after paying a deposit
Term of agreement	The length of time over which repayments are made	24 months
Credit agreement	A legal contract between the buyer and seller	A signed hire purchase contract
Total amount payable	The total cost including interest and fees	R12 000 instead of the R10 00 cash price
Finance charges	Extra costs associated with credit	Interest and administration fees
Administration fee	A fee charged for arranging the credit agreement	R150 once-off fee
Service fee	A monthly fee charged by the credit provider	R69 per month
Credit provider	Th business or institution lending the money	A furniture store or bank
Consumer	The person purchasing the goods	A customer buying a washing machine
Repayment	Money paid back towards a debt	Monthly instalment
Default	Failure to make required payments	Missing monthly instalments
Debt	Money owed to a lender	Outstanding balance on a hire purchase agreement
Ownership	Legal possession of an item. Under hire purchase, ownership transfers after the final payment	The buyer owns the Vehicle after the last instalment

WORKED EXAMPLE

Debbie wants to buy a water purifying system for her drinking water. The following options are available for her.

PAYMENT OPTIONS	PICTURE OF A WATER PURIFYING SYSTEM
Option 1: The cash price is R2 299 **Option 2:** • R216 per month • The amount includes insurance and service fee • 24 months to pay • Interest 17,25% p.a. **Option 3:** • R211 per month • Amount excludes insurance and service fee • 12 months • Interest 17,5% p.a.	

Use the information above to answer the questions that follow

1. Write the acronym *p.a.* in full. (2)

POSSIBLE ANSWER:
per annum

2. Calculate the amount of interest p.a. charged in option 3. (3)

POSSIBLE ANSWER:
R2 299 × $\frac{17,5}{100}$

R402,33

3. Debbie told her domestic worker that she would pay more than double the cash price if she chose to buy using option 2. (5)

Verify, showing all calculations, if Debbie's statement is correct.

POSSIBLE ANSWER:
Option 2 = R216 × 24 = R5 184

Difference =R5 184 − R2 299 = R2 885
She is correct

ACTIVITY 1

Lorenzo also wants to purchase a Lobster Sports Elite One Tennis Ball Machine with external battery option. This machine is for junior and senior players and its built with enhanced features.

CASH SALE	PICTURE OF THE LOBSTER SPORTS ELITE ONE TENNIS BALL MACHINE
CASH PRICE: R59 515,00 Purchase 3 machines and receive a discount of R22 781,75	
ONLINE CREDIT Interest: 12,5% Duration: 2,5 years	

[Source: dickssportinggoods.com]

Use the information above to answer the questions that follow.

1. Write down the number of payment options. (2)

2. Determine the total cost of purchasing 3 machines using the cash sale. (3)

3. Calculate, rounded to a whole number, the percentage discount Lorenzo will receive if he purchases 3 tennis ball machines on the cash sale. (4)

4. Lorenzo stated that he will pay more than R20 000 on interest if he purchases the tennis ball machine on online credit with 12,5 % interest compounded annually.

   Verify, showing ALL calculations, whether his statement is valid. (9)

5. Give a reason why it is better to purchase goods on cash. (2)

[20]

ACTIVITY 2

Miecke plans to install a house solar system unit consisting of a solar panel, a battery and an inverter. She sees the advertisement below in a community newspaper showing the two different payment options for the same unit.

HOME SOLAR SYSTEM UNIT PAYMENT OPTIONS	
OPTION 1: RENT-TO-OWN	**OPTION 2: CASH PRICE**
Pay for 7 years at R1 549 p/m Additional costs: R782 initiation fee Buy-out after rental period R7 820	R78 200 (incl. VAT)

[Adapted from https://solar.alumo.co.za]

Use the information above to answer the questions that follow.

1. Write down the monthly instalment for the rent-to-own option. (2)

2. Calculate, excluding VAT, the cash price of the home solar system unit. (3)

3. After seven years, Miecke decides to buy-out the rent-to-own option.

   Calculate the extra amount she has to pay compared to buying the home solar system unit for cash. (5)

[10]

LESSON OBJECTIVES

INFLATION

Learners must be able to:

OUTCOMES
Inflation is the general increase in the prices of goods and services over time. As prices increases, the purchasing power of money decreases, meaning that the same amount of money buys fewer goods and services than before. **NOTE:** Cost of goods will only decrease when we have a negative inflation rate. Decrease in the inflation rate does not mean decrease in the cost of goods and services – **Deflation**. 1. Define inflation and explain what it means in everyday life. 2. Explain the causes of inflation, including increased demand, rising production costs and changes in the economy. 3. Identify the effects of inflation on individuals, households, businesses and the economy. 4. Calculate the percentage increase in prices using the inflation formula. 5. Calculate the new price of an item after a given inflation rate. 6. Calculate the original price of an item when the new price and inflation rate are given. 7. Use the Consumer Price Index (CPI) to understand changes in the prices of goods and services. 8. Interpret inflation rates presented in tables, graphs and real-life financial information. 9. Compare prices from different years and determine how inflation has affected the cost of goods and services. 10. Apply inflation calculations to real-life situations, such as food, transport, electricity, rent and household expenses. 11. Explain the difference between inflation and deflation. 12. Make informed financial decisions by considering the effect of inflation on purchasing power and household budgets.

IMPORTANT TERMS AND DEFINITIONS

Term	Definition	Example
Inflation	A continuous increase in the general price level of goods and services.	Bread costing more this year than last year
Inflation rate	The rate at which inflation is calculated	Inflation rate of 5% per year
Price increase	An increase in the cost of a product or service	Petrol price increase
Cost of living	The amount of money needed to maintain a certain standard of living.	Monthly household expenses
Purchasing power	The value of money in terms of what it can buy	R100 buying fewer groceries
Consumer	A person who buys goods and services	A shopper at a supermarket
Goods	Physical items purchased by consumers	Food, clothing, furniture
Services	Activities provided for payment	Haircuts, transport, internet

Percentage increase formula

$$\text{Percentage increase} = \frac{New\ price - Old\ price}{Old\ price} \times 100$$

Effects of Inflation
Positive effects

- Business may earn higher revenues
- Property values may increase
- Investments may grow over time

Negative effects

- Cost of living increases
- Savings lose value if interest rates are lower than Inflation
- Consumers can buy fewer goods and services
- Transport and food costs become more expensive

Causes

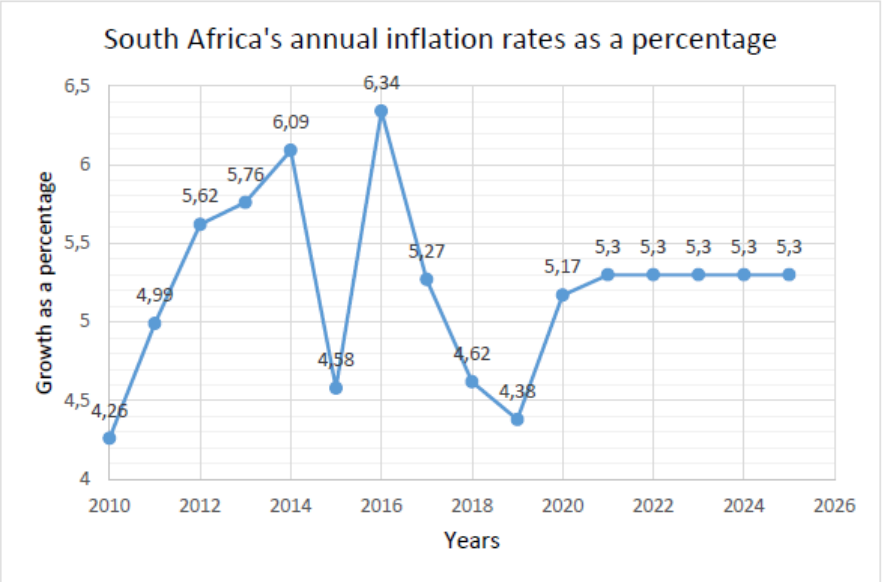
- Increased demand
- Increased production costs

Effects

- Higher prices
- Reduced purchasing power
- Increased cost of living

WORKED EXAMPLE

Jordan found the following graph showing the annual inflation rates as a percentage from 2010:



[Source: <www.statista.com>]

1. Calculate the average change in the inflation rate over the past five years, including 2020, rounded to two decimal places. (4)

POSSIBLE ANSWER:

$$\textbf{Average} = \frac{6.34+5.27+4.62+4.38+5.17}{5}$$

$$= 5{,}156$$

2. Explain why the graph has values for years that are still in the future. (2)

POSSIBLE ANSWER:

The additional years given show predictions relating to the inflation rate in the future based on the trends achieved in the previous years.

ACTIVITY 1

The table below shows the inflation rate for over a period of five years.

Table 1: Inflation rate for the period 2015 to 2020

Year	2015	2016	2017	2018	2019
Inflation rate (%)	6,34	5,27	4,78	4,8	5,3

Use the information above to answer the questions that follow.

1. Explain the meaning of the term inflation. (2)

2. Identify a year in which the inflation rate was the SECOND HIGHEST and write down the year. (2)

3. The inflation rate decreased by 0,49% between 2016 and 2017. Does this mean the prices of goods went down? Explain your answer. (2)

[06]

ACTIVITY 2

1. The average inflation rates for the period 2006 to 2010 are shown on table 1 below.

TABLE 1: AVERAGE INFLATION RATES FOR PERIOD 2006-2010

Year	2006	2007	2008	2009	2010
Average inflation rate	5%	6,5%	11,3%	7,2%	4,5%
Cost of loaf of bread (R)	4,34	4,56	4,85	5,40	5,79
Cost of a taxi trip to work (R)	5,00	5,25	5,59	6,22	6,97

Use the information above to answer the questions that follow:

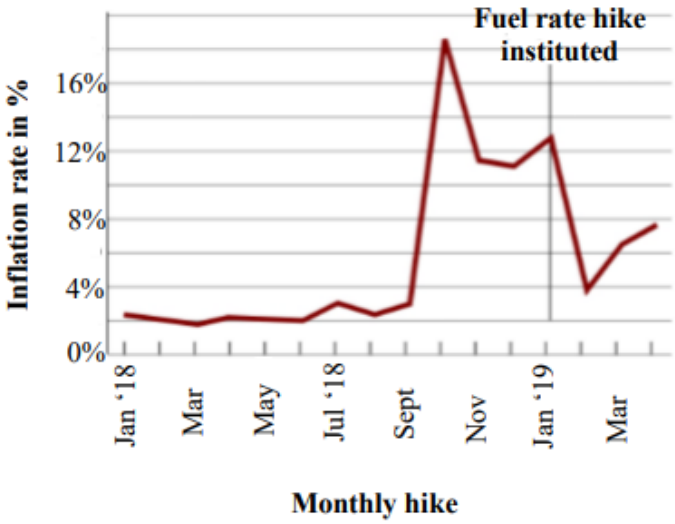
1.1 Explain the meaning of the term inflation. (2)

1.2 During which year was the inflation rate the highest? (2)

1.3 Determine the difference between the highest cost and the lowest cost of a taxi trip. (2)

1.4 Calculate the number of loaves of bread that can be bought with R270,00 in 2009. (2)

2. The graph below shows the month-to-month inflation rate for January 2018 to April 2019 as released by The Reserve Bank of Zimbabwe. The graph also indicates when a fuel rate hike was instituted.



Use the information above to answer the questions that follow.

2.1 Identify the statement that DOES NOT describe the inflation.

(a) It is an overall increase in the price of goods and services.
(b) It increases the purchasing power of currency.
(c) It is an economic or financial situation when one has to spend more to buy a loaf of bread; fill your car's tank with petrol or to get a haircut (amongst others). (2)

2.2 Identify the type of graph used to represent the inflation information above. (2)

2.3 Write down the year and month on the graph during which Zimbabwe experienced the lowest rate of inflation. (2)

2.4 Write down the year and months on the graph during which Zimbabwe experienced the biggest change in the inflation rate. (2)

2.5 Estimate the fuel's rate of increase for July 2018. (2)

2.6 Mugabe claimed that rate of inflation was negative in February 2019. Explain whether he was CORRECT or NOT CORRECT. (2)

[20]

LESSON OBJECTIVES

EXCHANGE RATES

Learners must be able to:

OUTCOMES
Exchange rate is the value of one country's currency compared to another country's currency. Exchange rates are used when people travel, trade internationally, import goods, export products, or send money between countries. **Knowledge** • Define the concept of exchange rates. • Identify different foreign currencies and their symbols. • Explain why exchange rates change. • Differentiating between "STRONG" and "WEAKER" currency. • Distinguish between buying and selling rates. **Skills** • Convert South African Rand (ZAR) into foreign currencies. • Convert foreign currencies into South African Rand. • Calculate travel budgets using exchange rates. • Solve real-life problems involving international travel and shopping. • Interpret exchange rate tables and financial information accurately. **Values and Attitudes** • Appreciate the importance of budgeting when travelling internationally. • Develop responsible financial decision-making skills.

IMPORTANT TERMS AND DEFINITIONS

Term	Definition	Example
Exchange rate	The value of one currency compared to another	R18.50 = $1
Currency	The money used in a country	Rand (R), Dollar ($)
Foreign currency	Currency from another country	Euro (€)
Local currency	Currency used in your own country	South African Rand (ZAR)
Conversion	Changing one currency into another	Rand to Dollar
Foreign Exchange (FOREX)	Buying and selling currencies	Currency exchange bureau
Bank Echange rate	Rate used by banks for currency conversions	Bank forex rate

Currency

Term	Symbol	Country/Region
South African Rand	**R or ZAR**	South Africa
United States Dollar	**$ or USD**	United States
Euro	**€ or EUR**	European Union
British Pound	**£ or GBP**	United Kingdom
Japanese Yen	**¥ or JPY**	Japan
Botswana Pula	**BWP**	Botswana
Namibian Dollar	**NAD**	Namibia
Australian Dollar	**AUD**	Australian

Exchange rates calculations

Term	Definition
Buying rate	Rate at which a bank buys foreign currency
Selling rate	Rate at which a bank sells foreign currency
Conversion rate	Exchange rate used for calculations
Amount received	Foreign currency obtained after conversion
Amount paid	Local currency used to purchase foreign currency
Transaction fee	Charge for converting money
Commission fee	Percentage charged for the service
Forex fee	Foreign exchange service charge

Effects of exchange rates
Strong currency

- Imports become cheaper.
- Overseas travel becomes more affordable.
- Foreign goods cost less.
- Because of stable economic markets.
- Export to the country with stronger currency.
- We get more money for our products.

Weak currency

- Imports become more expensive.
- Overseas travel becomes more expensive.
- Exports may benefit because South African goods become cheaper internationally.
- Because of unstable economic markets
- Import from the country with a weaker currency
- We get more products for our money

Tips: EXCHANGE RATES

Local currency – foreign currency = Divide
Foreign currency – Local currency = Multiply
Multiple currency conversions – moving to two or more currencies to determine

WORKED EXAMPLE

1. The Nox MM2 Hybrid Pro padel racket is priced at R2 499 in Sout Africa. A similar racket is available in the United States for USD 180. A padel player claims that it will be cheaper to purchase the racket in the United States. Verify, showing all calculations, whether the player's statement is valid if the current exchange rate is 1 USD = ZAR 18,19. (4)

POSSIBLE ANSWER

180 × 18,19

=R3 274,20

Cheaper to purchase the racket in South Africa

2. Neo earns an annual salary of €18 000.

   The official currency in the Ivory Coast is the France of the West African communities (XOF).

   On 16 March 2024, the exchange rate was €1 = 656 XOF.

   Calculate Neo's monthly salary in XOF. (4)

POSSIBLE ANSWER:

Annual salary
€18 00 = 18 000 × 656 XOF

= 11 808 00 XOF

Monthly salary

$$= \frac{11\,808\,000\ XOF}{12}$$

= 984 000 XOF

ACTIVITY 1

1. The pie charts on ANNEXURE D show the Indian Union budgets for income and expenditure for 2023/2024. Some values have been omitted.

   The currency used in India is the rupee. Inda also has different denominations for the larger currency amounts.

   NOTE: 100 000 rupees = 1 lakh
   100 lakhs = 1 crore

   Use ANNEXURE D and the information above to answer the questions that follow.

1.1 Choose the correct word from those given in brackets. Write down only the word next to the question number (1.1).

A budget is a (deficit/surplus/balanced) budget when the income is less than expenditure. (2)

1.2 General sale tax (GST) is a tax that is similar to VAT in South Africa.

Calculate the missing percentage for GST on the pie chart. (3)

1.3 Calculate, in lakh crores, the amount spent on defence in India. (3)

1.4 List THREE sources of income shown on the pie chart where the total percentages add up to the borrowing percentage value. (3)

1.5 Sanji calculated, in lakh crores, the amount spent on interest payments.
He rounded off his answer to the nearest whole number.

Sanji stated that the rounded answer he calculated did not make much difference in rupee when compared to the non-rounded answer.

Verify showing ALL calculations, whether his statement is valid. (6)

2. In 2024, South Africa received R302,4 billion from corporate income tax.

   NOTE: R1 000 000 = 4 447 989,1 rupees
   4 447 989,1 rupees = 44,4479891 lakhs

[Source: Adapted from www.wise.com/, 10 June 2024]

2.1 Convert R302,4 billion to mullion rands. (2)

2.2 Hence, convert the South African corporate income tax to lakh crore. (4)

[23]

ACTIVITY 2

Terry wants to visit his brother who is staying in Canada. Before he leaves, he wants to exchange R1 670,00 for Canadian dollar.

TABLE 7 below shows the currency conversion factors for Countries as at 23 February 2025

TABLE 7; CURRENCY CONVERSION FACTORS FOR FUVE COUNTRIES AS AT 23 FEBRUARY 2025

CURRENCY	UNITES PER ZAR	ZAR PER UNIT
Canadian Dollar (CAD)	0,077572	12,891276
Swiss Franc (CHF)	0,048928	20,438165
Indian Rupee (INR)	4,720072	0,211861
Botswana Pula (BWP)	0,750625	1,332224
Libyan Dinah (LYD)	0,266678	3,749838

[Source: Adapted from www.x-rates.com]

Use TABLE 7 to answer the questions that follow.

1. Define the term *Exchange rates.* (2)

2. Identify the currency that is weaker than the South African rand. (2)

3. Calculate the amount Terry will receive in Canadian Dollar (CAD). (3)

[07]

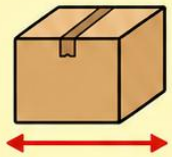
LESSON OBJECTIVES

PACKAGING

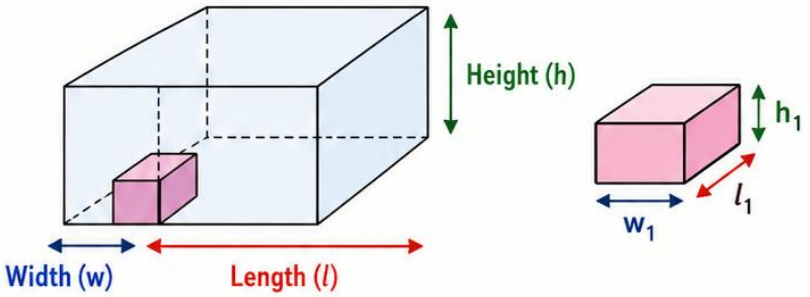
Learners must be able to:

OUTCOMES
1. Define packaging and explain its purpose in everyday life 2. Identify deferent types of packaging, such as boxes, bottles, cans, bags, cartons and containers. 3. Distinguish between primary, secondary and tertiary packaging 4. Identify and interpret dimensions of packaging, including length, width, height, diameter and radius. 5. Calculate the volume and capacity of different packaging containers. 6. Compare different packaging options and determine which provides better value for money. 7. Solve real-life problems involving packaging, including storage, filling, wrapping and transportation. 8. Round answers appropriately and include correct units in final answer.

PACKAGING LENGTH-WISE



Length (l) is the longest dimension of the box (from front to back).

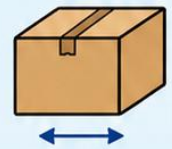


The **Length (l)** of the small box is packed along the **Length (l)** of the large box.

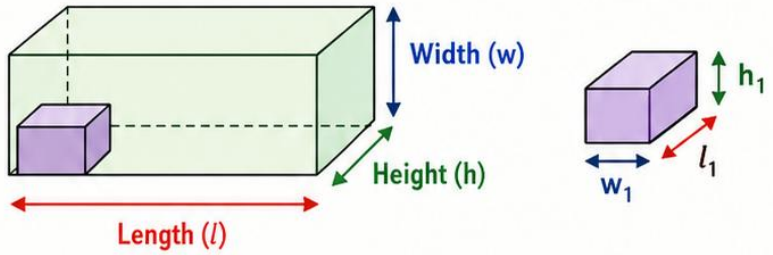
CALCULATION:

The number of small boxes = **Length** of large box ÷ **Length (l_1)** of the small box that can be packed along **Length (l)** of the large box.

PACKAGING WIDTH-WISE



Width (w) is the side dimension of the box (from left to right).

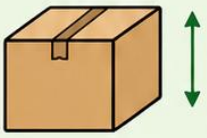


The **Width** of the small box is packed along the **Width/Breadth** of the large box.

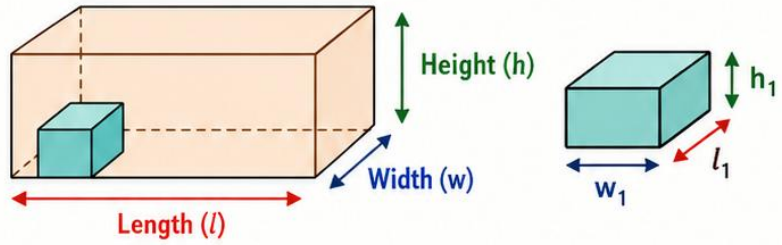
CALCULATION:

The number of small boxes = **Width (w)** of large box ÷ **Width (w_1)** of the small box that can be packed along **Width (w)** of the large box.

PACKAGING HEIGHT-WISE



Height (h) is the vertical dimension of the box (from bottom to top).



The **Height (h)** of the small box is packed along the **Height (h)** of the large box.

CALCULATION:

The number of small boxes = **Height (h)** of large box ÷ **Height (h_1)** of the small box that can be packed along **Height (h)** of the large box.

Total number of small = number at **length** × number at **width** × number at **height** boxes packed

WORKED EXAMPLE

Mrs Lingham instructed her workers to pack the coffee mugs in boxes. The dimensions of coffee mugs and boxes are given below.





Dimensions of box:	Dimensions of coffee mug:
Length = 310 mm Width = 220 mm Height = 150 mm	Radius = 39 mm Height = 94 mm

1. Mrs Lingham claims that 6 mugs will fit in 1 box. Verify, showing all calculations, whether her statement is valid or not. (8)

POSSIBLE ANSWER:
Over length = 310 mm ÷ 78 mm
= 3,97…..
= 3 coffee mugs
Over the width = 220 mm ÷ 78 mm
= 2,8…..
= 2 coffee mugs
Over the height = 150 mm ÷ 94 mm
= 1,6 ….
= 1 coffee mug
Number of mugs in 1 box = 3 × 2 × 1
= 6 coffee mugs
The statement is valid

2. Show that the height of the coffee mug is 62,7% of the height of the box (2)

POSSIBLE ANSWER:
Percentage = (94 ÷150) x 100

= 62,7%

ACTIVITY 1

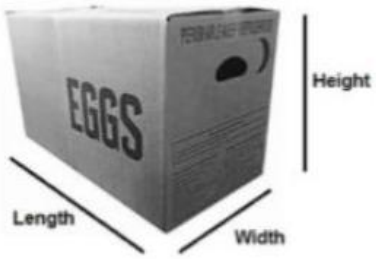
1. Chicken eggs are being packed in different egg tray holders. The picture below shows an egg tray holder holding 30 eggs. These trays are then packed in cardboard boxes for distribution.

Dimensions of the egg tray	Dimensions of the cardboard box
Length = 31.5	Length = 65cm
Width = 30cm	Width = 30.5cm
Height = 5cm	Height = 33cm

Egg tray holding 30 eggs



Cardboard box

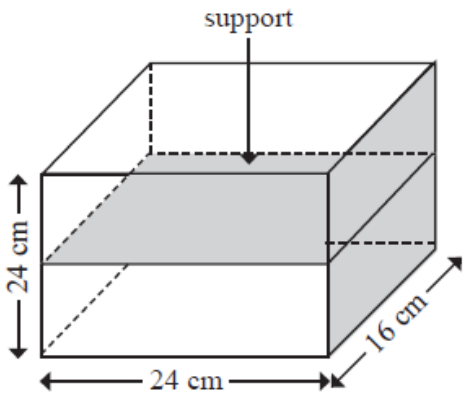


Use the information above to answer the questions that follow

1.1 What is the maximum number of egg tray holders that can be stacked on top of each other, that will fit in the height of the box? (3)

1.2 Hence, determine the total number of egg tray holders that can be packed into ONE box, if the length of the egg tray will be packed along the length of the cardboard box. (4)

2. James decided to distribute candles to local churches. He would like to pack cylindrical candles into a rectangular container for distribution. Each candle is 11 cm high and measures 8 cm in diameter.

Picture of candle (with dimensions)	Digram of box used for candles
	

[Source: www.amazon.in]

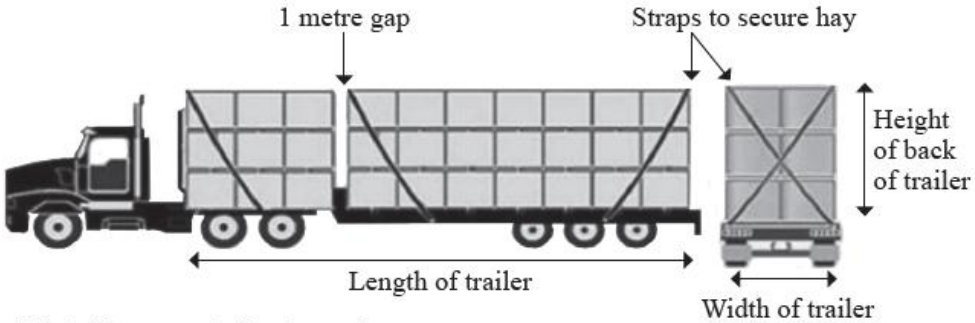
Study the picture and diagram above and answer the questions that follow.
James realises that he can pack the candles on top of each other if he places a support that is 10 mm thick, between the layers. The container that he uses is 24 cm high, 16 cm wide and 24 cm long.

Calculate how many candles he can pack into this container. (5)

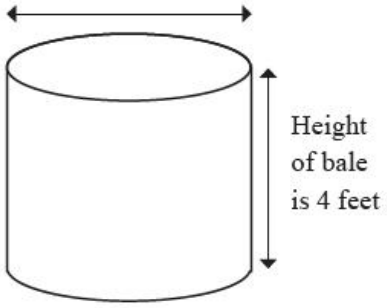
[12]

ACTIVITY 2

Cylindrical hay bales are grass, legumes, or other herbaceous plants that have been cut and dried to be stored for use as animal feed. In Australia, farmers order hay bales which are delivered in large trucks as seen below.



[Adapted from: www.beefmaster.co.za]





NOTE: 1 foot = 0,3048m
1 pound = 453,59g
1 ton = 1 000 kilograms
1Australian Dollar = R9,9333

Use the information above and answer the questions that follow.

1. Determine the total number of hay bales being transported. (2)

2. Determine the length of the trailer and the height of the trailer in metres. (3)

3. The driver claimed that the total volume of hay bales in the truck is approximately 48 m^3. Verify this claim.

   Volume of a cylinder = $\pi \times (\text{radius})^2 \times$ height. Use $\pi = 3,142$ (7)

[12]

LESSON OBJECTIVES

PLANS

Learners must be able to

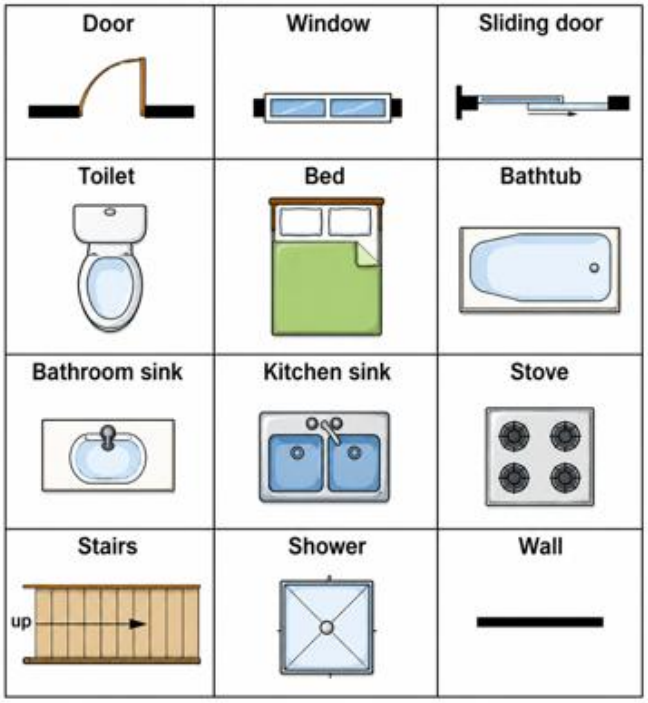
OUTCOMES

What is a floor plan?
A floor plan is a diagram which shows a two-dimensional view of a building from above excluding the roof of a building.

The following information may be obtained from the floor plan:

- The size and shape of a building/house including all the dimensions of each room.
- The position of all the features of the building, the doors, windows, basins, toilets cupboards, showers etc.

Symbols that are used for floor plans:



What are Elevation plans?
They are 2-dimensional pictures of the outside of the building showing side views of the house or building.

We have four elevations:

North Elevation The side view of the building from the northern side	**South elevation** The side view of the building from the southern side
East elevation The side view of the building from the eastern side.	**West elevation** The side view of the building from the western side



- Elevation plans shows the information about the height of the building and the external features.
- These plans are named using compass directions.
- The information about the dimensions of the rooms are not shown

Knowledge

- Define a house and elevation plans and explain their purposes.
- Identify common symbols used on a house plan.
- Identify elevation plans of a house.
- Understand the concept of scale drawings.
- Recognize different rooms and structural features.

Skills

- Interpret house plans correctly.
- Calculate actual dimensions using the given scale.
- Calculate perimeter and floor area of rooms.
- Calculate flooring, painting and tiling costs.
- Compare room sizes and determine total floor area.
- Interpret measurements and construction information accurately.

Values and Attitudes

- Appreciate the importance of accurate planning in construction.
- Develop problem-solving skills using real-life building plans.

IMPORTANT TERMS AND DEFINITIONS

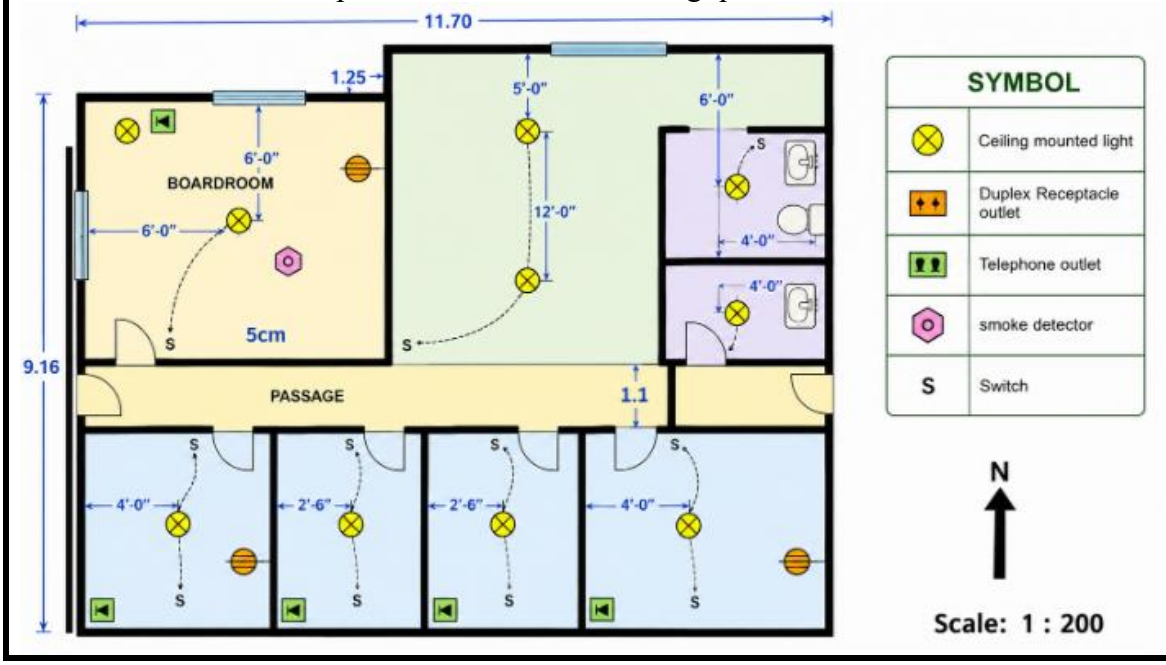
Term	Definition	Example
House plan	Drawing showing the layout of a building	Floor plan
Floor plan	View from above of the inside of a house	Bedroom layout
Scale	Relationship between drawing and actual size	1 : 100
Dimensions	Measurement of length or width	5 m
Boundary	Outside edge of property	Fence line
Wall	Structure diving rooms	Brick wall
Partition wall	Internal wall	Bedroom divider
Exterior wall	Outside wall	Front wall
Interior wall	Wall inside the house	Kitchen wall
Room	Enclosed area	Loung
Passage	Corridor connecting rooms	Hallway
Entrance	Main access point	Front door
Window	Opening for light	Bedroom window
Door	Entrance into a room	Bedroom door
Builtin cupboard	Fixed storage space	Bedroom cupboard
Kitchen unit	Fixed cupboards in a kitchen	Cabinets
Garage	Space for vehicle	Double garage
Patio	Outdoor paved area	Entertainment area
Veranda	Roofed open area	Front veranda
Bathroom	Room with bath/shower	Bathroom
Ensuite	Bathroom attached to bedroom	Main bedroom ensuite
Dining room	Eating area	Dining room
Lounge	Living room	TV room
Study	Office room	Home office
Utility room	Laundry area	Washing room

Conversion: Metric

Convert from	Convert to	Multiply/Divide
mm	cm	÷ 10
mm	mm	× 10
cm	m	÷ 100
m	cm	× 100
cm^2	m^2	÷ 10 000
m^2	cm^2	× 10 000

WORKED EXAMPLE [29 Marks]

A floor plan for offices is given below. The length of the building on the plan is 11,70 cm, and the width is 10.4 cm. an electrical plan is also attached to the floor plan. Use the information on the floor plan to answer the following questions.



1.1 Determine the number of telephone outlets in the building. (2)

POSSIBLE ANSWER: 05

1.2 Write down the ratio of the outside doors to the inside doors in simplest form. (2)

POSSIBLE ANSWER
2 : 6
1 : 3

1.3 Explain the meaning of the scale on the plan. (2)

POSSIBLE ANSWER
One unit on the map represents 200 units in reality. ✓✓

1.4 Use the given scale to determine the actual dimensions of the building. (4)

POSSIBLE ANSWER

Length = 11,7 × 200
= 2 340 cm
= 23,4 m

width = 10,4 × 200
= 2 080 cm
= 20,8 m

1.5 Determine the probability of finding a window on the eastern wall of the offices. (2)

POSSIBLE ANSWER: 0%

Jane and Tom are the newly-weds. They plan to build a house using the floorplan and elevations shown in ANNEXURE E.

Use the information above and ANNEXURE D to answer the questions that follow.

2.1 How many bedrooms are shown on the floorplan? (2)

POSSIBLE ANSWER: 03

The elevations are numbered from 1 to 4. Match the elevation with the correct number e.g. West elevation 3.

(a) North elevation
(b) South elevation
(c) West elevation
(d) East elevation (4)

POSSIBLE ANSWER:
North elevation – 2
South elevation – 1
West elevation – 4
East elevation – 3

2.2 Is this plan for a single or double storey house? (2)

POSSIBLE ANSWER
Double storey

2.3 The actual length of the northern wall is 20 metres. Calculate the length on the floorplan. (3)

POSSIBLE ANSWER
Length on the floorplan
1 : 250
1 cm : 250 cm
20 cm × 100

$= \frac{2\,000\ cm}{250}$
= 8 cm

2.4 How many doors are found on the first floor? (2)

POSSIBLE ANSWER: 5 doors

2.5 Give the compass direction of the kitchen from the garage. (2)

POSSIBLE ANSWER: EAST

ANNEXURE E



[Source: Adapted from www.floorplans.com]

ACTIVITY 1

The layout and elevation plans are shown on ANNEXURE F.

Use the following information:
1 foot = 0,3048 m
1 inch = 2.54 cm
50’ represents 50 feet
10’’ represents 10 inches

Study ANNEXURE F and answer the questions that follow.

1. If the outer door of the waiting room is facing north, determine the direction the window of the break room is facing. (2)

2. The width of the clinic is 29 feet and 10 inches. Convert the width to metres. (4)

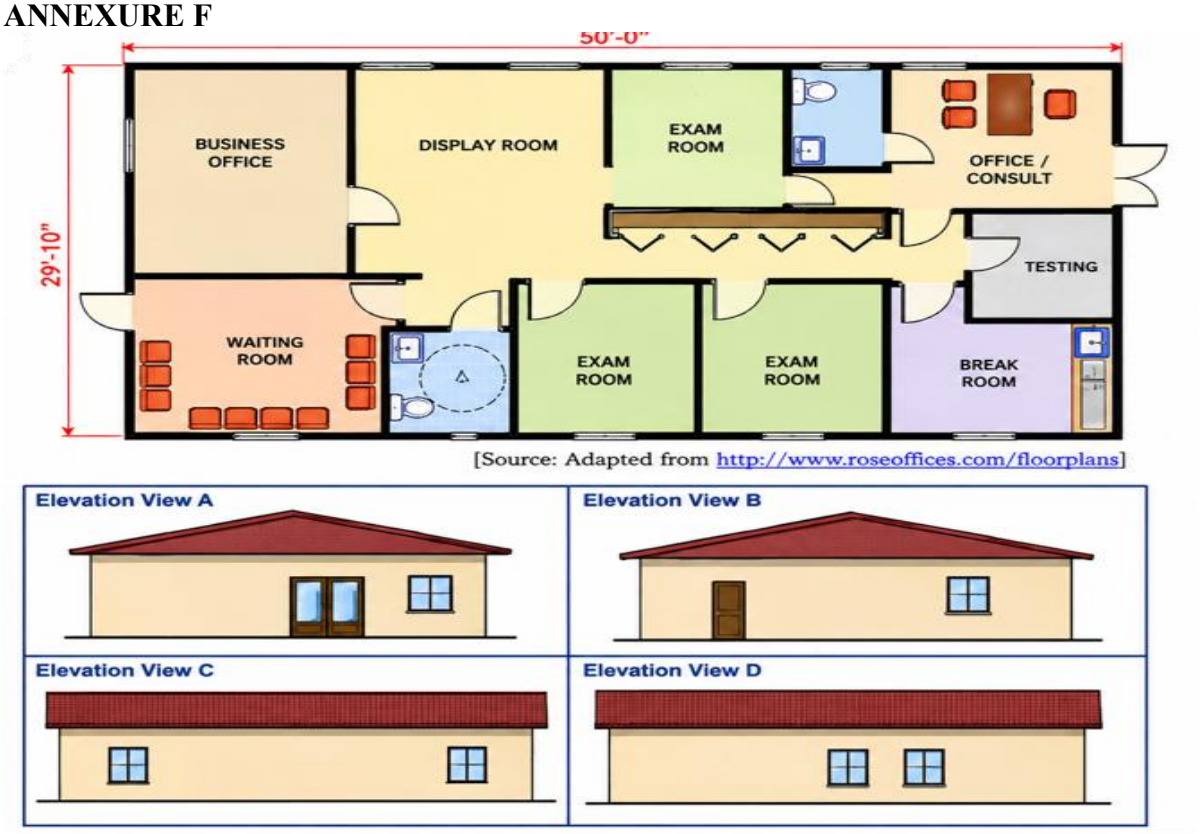
3. Calculate the scale of the plan if the length of the clinic is 50 feet as indicated on the plan and the measurement on the plan is 135 mm.

   Express your answer in the form 1 : … (5)

4. Which one of the elevation plans is incorrect? Justify your answer. (3)

[14]

ANNEXURE F



[Source: Adapted from http://www.roseoffices.com/floorplans]

ACTIVITY 2

The farm owner has four houses that he uses to accommodate guests. The plan for one of the houses is shown in ANNEXURE G.

Use the plan shown in ANNEXURE G to answer the following questions.

1. Write down the number of windows shown on the northern side of the house. (2)

2. One of the guests claimed that both bedrooms would receive sun in the morning. Is the claim true or false? (2)

3. Use the actual length shown on the plan to determine the scale of the plan in the format 1 : ... Round your answer to the nearest whole number. (4)

4. Pulane states that this is an open-plan design. Explain why she is correct. (2)

5. Possible elevation plans for the house are also shown in ANNEXURE G.

   (a) Explain the term *elevation plan.* (2)

   (b) The elevations are indicated using letters A and B. write down the elevation for letter A. (2)

[14]

ANNEXURE G


HOUSE PLAN AT THE GUEST FARM
En-suite Bathroom
Bedroom 1
Bathroom
Bedroom 2
11,5 m
N
ELEVATION PLANS
A
B
[Source: www.dashcapitals.co.za]

LESSON OBJECTIVES

BODY MASS INDEX

Learners must be able to:

OUTCOMES
Is a measure of body weight, based on a person's weight and height. The BMI can then be used to classify a person's weight status, as underweight, normal, overweight or obese. Percentiles are used to categorize BMI in children and adolescents, while adults are categorized based on BMI ranges. 1. Define Body Mass Index (BMI) and explain what is used for. 2. Identify the measurements needed to calculate BMI, namely body mass and height. 3. Use the BMI formula correctly. 4. Convert height measurements from centimetres to metres when necessary. 5. Calculate BMI accurately using given mass and height. 6. Interpret BMI values using appropriate BMU classification table. 7. Determine whether a person's BMI falls within the underweight, healthy/normal, overweight or obesity categories 8. Solve real-life problems involving BMI using tables, diagrams and written information. 9. Interpret information presented in BMI charts and tables.

BMI-for-Age Percentiles for Children and Adolescents			
Underweight • BMI < 5th percentile	**Normal Weight** • BMI = 5th84th percentile	**Overweight** • BMI = 85th-94th percentile	**Obese** • Obese: BMI ≥ 95th percentile

BMI Categories for Adults			
Underweight • BMI < 18.5	**Normal Weight** • BMI = 18,524,9	**Overweight** • BMI = 25-29,9	**Obese** • Obese: BMI ≥ 30

WORKED EXAMPLE

Mr Phiri the head of curriculum at Gauteng North district went to OR Tambo international airport to welcome 5 exchange students from Australia. The 3 girls and 2 boys were accommodated at Protea hotel in Pretoria for the first 3 days. On the second day, they all had fever. Mr Phiri took the students to Steve Biko hospital for consultation. Before any medical examination, the nurse took
the readings of their mass, height, blood pressure and temperature.

Use the Growth and Body mass charts on Annexure A respectively to answer this question.

1. Give a possible reason why they all had fever on the same day? (2)

POSSIBLE ANSWER:
Climate change. (This type of question has more than one answer. The answer will be correct if it makes sense based on the given situation).

2. Ian had the BMI-for-age value that positioned him on the 60th percentile.
What does this mean? (2)

POSSIBLE ANSWER:
60% of boys have BMI for age value that is less than his BMI40% of boys have BMI for age value that is greater than his BMI

3. How old is Bruce, if his MBI of 25kg/m2 positions him on the 85th percentile?
(2)

POSSIBLE ANSWER:
17 years

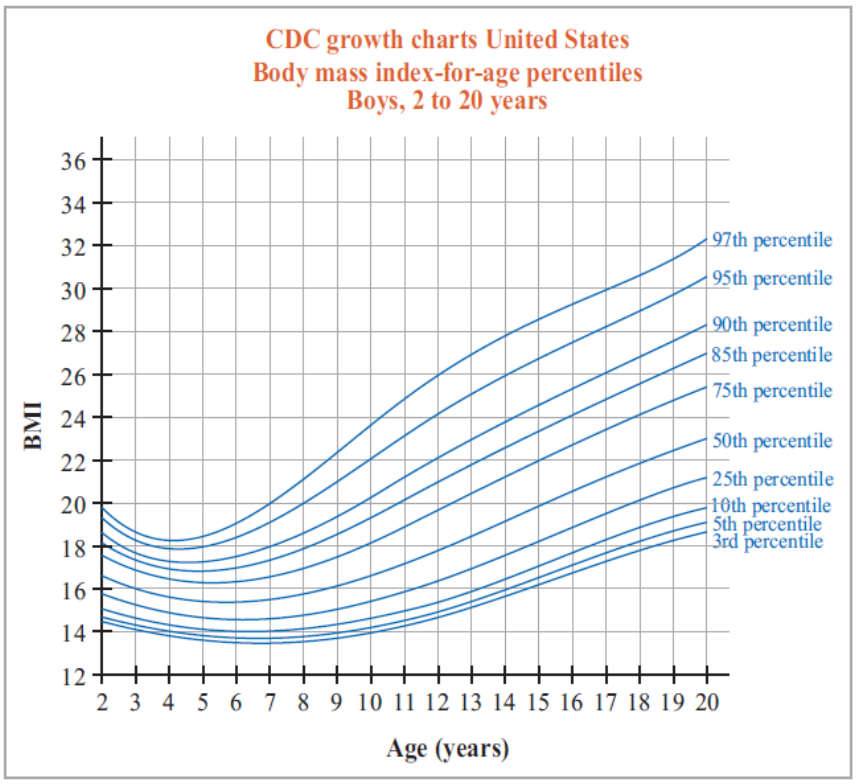
4. Joy is a 16-year-old girl with a BMI-for-age value of that positioned her on the 50th percentile. Determine her BMI. (2)

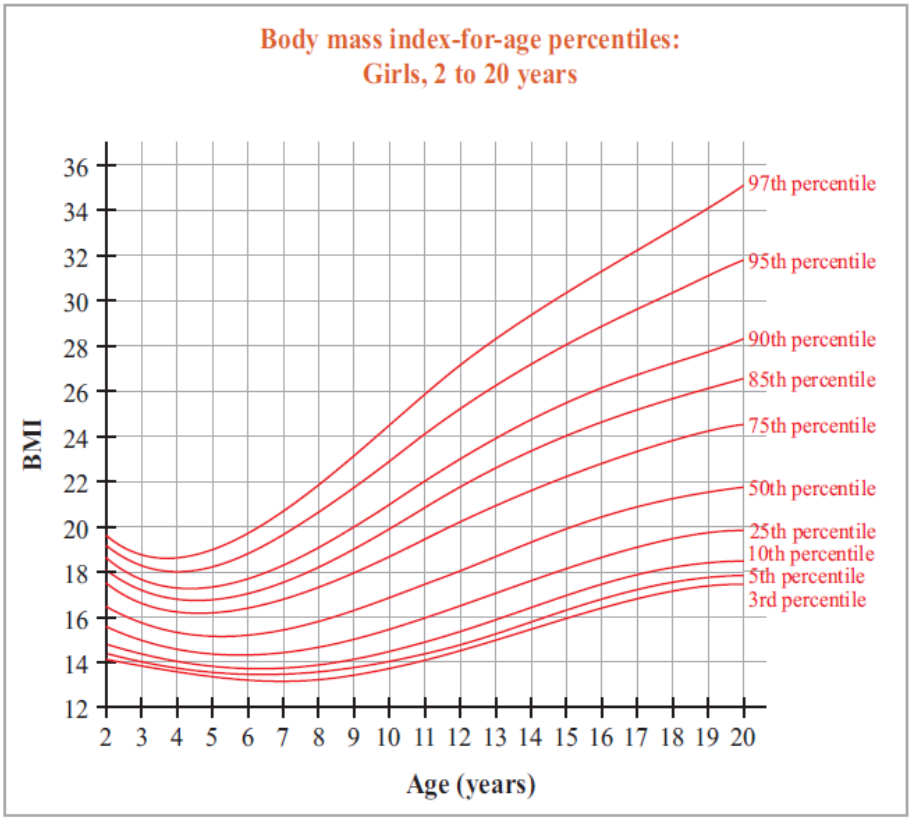
POSSIBLE ANSWER:
20,5 kg/m^2

5. The nurse said that Celine has the average BMI. What does this mean? (2)

POSSIBLE ANSWER:
Average is represented by 50%, therefore 50% of boys have a BMI for age value that is less than her BMI by50% of boys have BMI for age value that is greater than her BMI.

Figure 1: Growth Chart





ACTIVITY 1

Mr Mokoena and Ms Dolo, the soccer and netball coaches at Pretoria West High school have taken 2 girls and 2 boys who were selected to take part in the provincial competition to Mr Magana the local doctor, to check their health status. Medical examinations were done, and results were given.

Weight Status Table	
BMI for age percentile range	**Health status**
Less than 5th percentile	Underweight
5th – 84,9th percentile	Healthy
85th – 94,9th percentile	Risk of overweight
95th percentile and above	Overweight

You may use the formula: **BMI** =

$$\frac{\textbf{Mass in kg}}{(\textbf{Height in m})^2}$$

Use the table above to answer the questions that follow.

1. Determine Lethabo's health status who is 14 years old and her BMI is 21kg/m^2 (3)

2. What advise do you think Mr Magana will give the educators about Thato, the 16-year-old boy who has the BMI of 16kg/m^2.

   Give **TWO** advises (6)

3. Mahlogonolo the 15-year-old grade 8 girl, is 150cm tall and weighs 60kg.
   Determine her health status. (6)

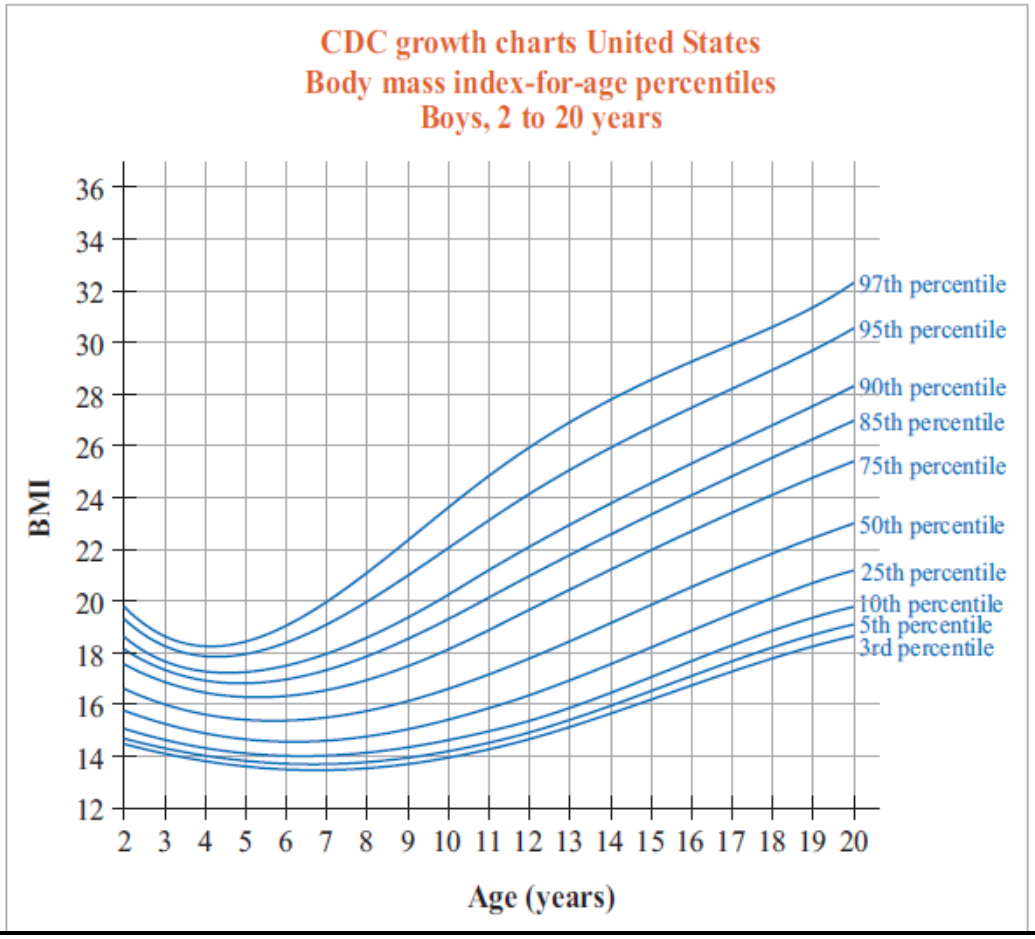
4. How much weight must Mahlogonolo lose to be classified under the healthy category? (7)

[22]

ACTIVITY 2

1.3 The doctor has examined Lethabo and Tumi to get their status and compare it to the health status of John's son. Study the growth chart below and the weight status table to answer the following questions.

Use the Growth and Body Mass charts on Figure 3 below respectively to answer this question.



1. Determine Tumi's weight status if he is 16 years old and his BMI is 16,6kg/m2. (2)

2. 14-year-old Lethabo has a BMI that places him between the 85th and the 90th percentile curve. What is Lethabo's weight status? Suggest the advice that the doctor should give to Muzi? (3)

3. John claimed that his 17-year-old son who is 1,5m tall and weighs 55 000g has a healthier status than Muzi's sons. Verify his claim. (6)

[11]

LESSON OBJECTIVES

PROBABILITY

OUTCOMES
1. Define probability and explain its meaning in everyday situations. 2. Identify experiments, outcomes, events and sample spaces in probability situations 3. Distinguish between certain, possible and impossible events. 4. Identify likely outcomes in simple probability experiments. 5. Calculate theoretical probability. 6. Express probability as a fraction, decimal and percentage. 7. Use probability scales to describe the likelihood of events. 8. Determine the probability of an event not occurring. 9. Use tables, diagrams and list to represent possible outcomes. 10. Compare theoretical and experimental probabilities. 11. Solve real-life probability problems, such as weather forecasts, games, surveys, risk and decision-making

IMPORTANT TERMS AND DEFINITIONS

Term	Definition	Example
Probability	The chance that an event will happen	The probability of getting a 6 on a die is 1 out of 6
Event	An outcome or group of outcomes from an experiment	Rolling an even number on a die
Outcome	A possible result of an experiment	Getting a 4 when rolling a die
Sample space	The set of all possible outcomes	{1,2,3,4,5,6} when rolling a die
Favourable outcome	The outcome(s) that satisfy the event	Rolling a 6 when the event is "getting a 6"
Experiment	An action or process that produces outcomes	Tossing a coin
Equally likely outcomes	Outcomes that have the same chance of occurring	Heads and tails on a fair coin
Certain event	An event that is guaranteed to happen	Getting a number less than 7 on a standard die

Impossible event	An event that cannot happen	Rolling ab 8 on a standard die
Complement	The probability that an event will not occur	Not getting a 6 on a die
Independent events	Events where one does not affect the other	Tossing a coin and rolling a die
Dependent events	Events where one affects the probability of another	Drawing cards without replacements
Tree diagram	A diagram used to show all possible outcomes	Coins toss followed by a die roll
Venn diagram	A diagram showing relationship between sets of events	Learners who play soccer and rugby
Relative frequency	The number of times an event occurs divided by the total number of trials	20nheads in 50 coin tosses = 20/50
Theoretical probability	Probability based on mathematical reasoning	Probability of rolling a 3 = 1/6
Experimental probability	Probability based on actual results from an experiment	Obtained from repeated coin tosses
Odds	A comparison of favourable outcomes to unfavourable outcome	Odds of rolling a 6 are 1:5
Mutually exclusive events	Events that cannot happen at the same time	Rolling a 2 and a 5 on one die roll
Random	Occurring by chance without a predictable pattern	Selecting a learner's name from a hat
Bias	Where results favour a particular outcome unfairly	A weighted coin

Probability scale

Probability	Meaning
O	Impossible
0.25	Unlikely
0.5	Equal chance
0.75	Likely
1	Certain

WORKED EXAMPLE

Mr Shibambo is the Grade 11 grade head at his school. The school hosts an annual Grade 11 dance. Learners choose the dress code for the event. Mr Shibambo conducts a survey to confirm the dress code for the 2013 event. The results are recorded in the frequency table below.

TABLE 1

DRESS CODE	BOYS	GIRLS
FORMAL	20	40
TRADITIONAL DRESS	5	15
FANCY DRESS	5	5
CASUAL WEAR	30	10

1. Calculate the total number of learners who responded to the survey. (2)

POSSIBLE ANSWER:
Total = 20 + 5 + 5 + 30 + 40 + 15 + 5 + 10
= 130

2. Calculate the percentage of the learners who preferred CASUAL wear as the dress code for the Grade 11 dance. (3)

POSSIBLE ANSWER:
Percentage preferring casual wear
$= \frac{40}{130}$ **x 100%**
= 30,77%

3. Which dress code is the least preferred by the Grade 11 learners? (2)

POSSIBLE ANSWER:
Fancy dress

4. If a Grade 11 learner is chosen at random from the group that was interviewed, what is the probability that the learner:
   (a) Preferred formal wear (2)
   POSSIBLE ANSWER:
   P $= \frac{60}{130}$

ACTIVITY 1

1. The data in the table below represent the distance (in km) that the learners from Exhibition High School walked to school the morning before a Mathematical Literacy test and the marks (out of 50) that they obtained for the test.

   Use the data below to answer the questions that follow.

TABLE 2 : Distance (in km) travelled by learners

0,2	**0,5**	**0,3**	**1,2**	**0,25**
0,75	**1,3**	**3**	**1,2**	**1,8**
2,4	**1,5**	**0,2**	**0,8**	**2,6**
3	**1,4**	**0,75**	**0,5**	**1,2**
3,2	**0,8**	**0,3**	**1**	**1,8**

TABLE 3 : Marks obtained for the test

49	**38**	**37**	**30**	**39**
34	**29**	**19**	**27**	**25**
20	**28**	**43**	**33**	**41**
15	**25**	**38**	**40**	**30**
18	**30**	**39**	**28**	**28**

1.1 Determine the probability of randomly selecting a learner who walked less than 1 km on the day of the test. (2)

1.2 Determine the probability of randomly selecting a learner who scored more than 35 out of 50 for the test. Write your answer as a decimal. (2)

[04]

ACTIVITY 2

Quinton cannot decide what to wear to a party. He has three pairs of jeans – a grey, a black and purple jean that he can choose from. He also has four shirts – a white shirt, a maroon t-shirt, a red shirt and a green t-shirt. He pulls a shirt from his drawer without looking.

The two-way table that shows different possible combinations is given below.

Table 1: Two-way table that shows different possible combinations.

	White shirt (W)	Maroon t- shirt (M)	Brown shirt (B)	Green t-shirt (G)
Grey pants (G)	G; W	**A**	G; B	G; G
Black pants (B)	**C**	B; M	B; B	B; G
Purple jeans (P)	P; W	P; M	**B**	P; G

1. Write down the total number of possible outcomes. (2)

2. Is Quinton's choice of shirt dependant or independent of his choice of pants? Explain your answer. (3)

3. Complete the missing combinations.

(a) A (2)

(b) B (2)

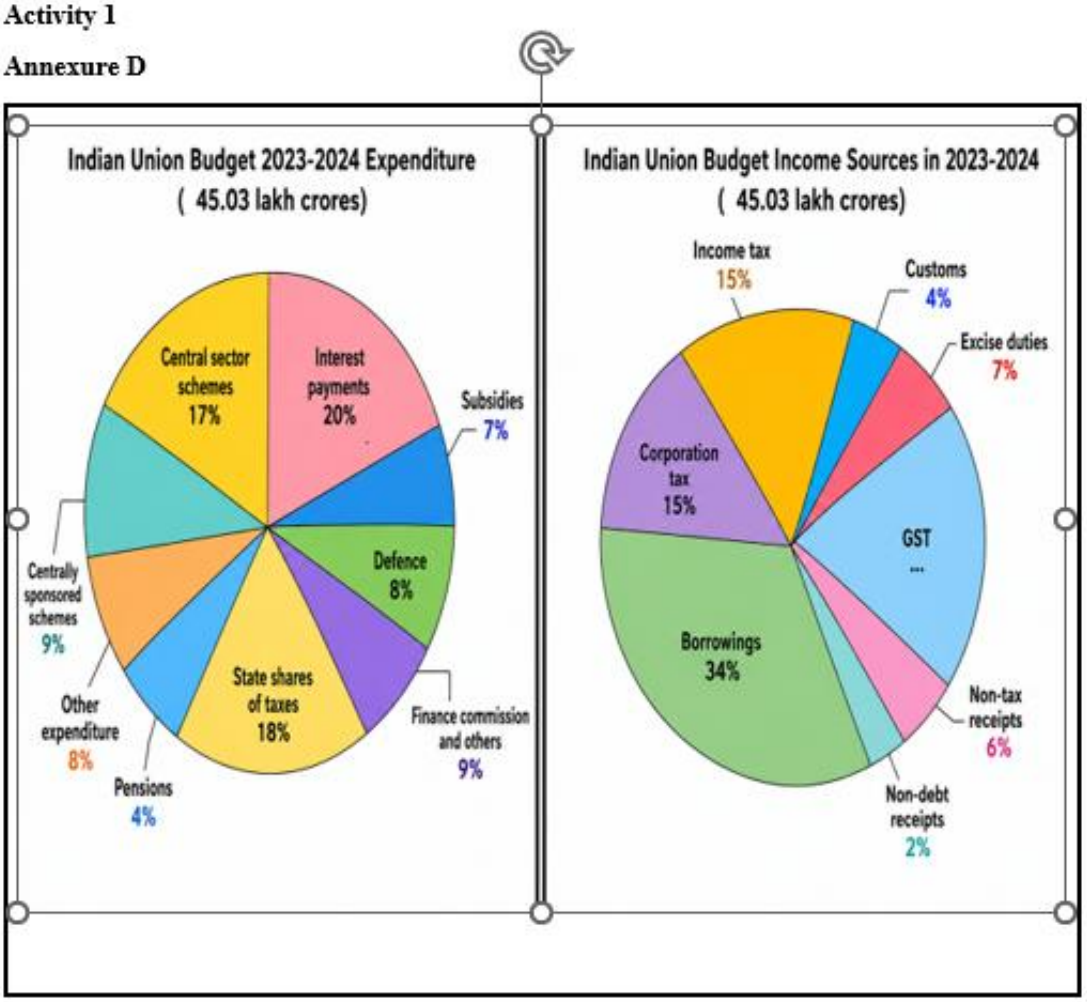
4. Determine the probability of Quinton wearing a white shirt and black pants. Leave your answer in as a simple fraction. (2)

5. Calculate the probability (as a percentage) of Quinton NOT wearing his green T-shirt. (3)

[14]

Activity 1

Annexure D



[Source: Adapted from https://www.equentis.com]



BIBLIOGRAPHY

2	Free State September preparatory examination 2025
3	Kwazulu-Natal September preparatory examination 2025
4	Limpopo September preparatory examination 2025
5	Northwest September preparatory examination 2025
6	Gauteng September preparatory examination 2025
7	May/June examination 2025 and 2026
8	Jenn Autum and Spring Material 2025
9.	Jenn winter and Spring Material 2025 Eastern Cape