

Targeter

CBC Tracker

Grade

7

Answer Booklet

Volume 2



Targeter Publishers Ltd
Wings of Excellence

COMPETENCY BASED CURRICULUM

CONTENTS

MATHEMATICS	1 - 50
INTEGRATED SCIENCE	51 - 65
AGRICULTURE	66 - 83
PRE-TECHNICAL STUDIES	84 - 100
CREATIVE ARTS	101 - 118

MATHEMATICS

1.0 Numbers

1.1 Whole numbers

Activity 1

1. Draw a Place Value Chart

Here is an example of a place value chart that goes up to hundreds of millions:

Hundreds of Millions	Tens of Millions	Millions	Hundreds of Thousands	Tens of Thousands	Thousands	Hundreds	Tens	Ones
----------------------	------------------	----------	-----------------------	-------------------	-----------	----------	------	------

2. Fill in 742,068,395

Fill the number into the chart:

Hundreds of Millions	Tens of Millions	Millions	Hundreds of Thousands	Tens of Thousands	Thousands	Hundreds	Tens	Ones
7	4	2	0	6	8	3	9	5

3. Place Values of Specific Digits

- **7:** Hundreds of Millions (700,000,000)
- **2:** Millions (2,000,000)
- **0:** Hundreds of Thousands (0,000)
- **8:** Thousands (8,000)

4. Place Values of Other Digits

- **4:** Tens of Millions (40,000,000)
- **6:** Tens of Thousands (60,000)
- **3:** Hundreds (300)
- **9:** Tens (90)
- **5:** Ones (5)

Activity 2

5. Identify the total values of digits in the number 3472961:

- 3 → 3,000,000
- 4 → 400,000
- 7 → 70,000
- 2 → 2,000
- 9 → 900
- 6 → 60
- 1 → 1

2. Fill in the place value chart for 3472961:

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
3	4	7	2	9	6	1

3. Repeat the activity with different numbers up to hundreds of millions.

Example: 245,681,309

Hundreds of Millions	Tens of Millions	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
2	4	5	6	8	1	3	0	9

4. Digit 4 is in the ten-thousands place:
 $4 \times 10,000 = 40,000$.

5.
• Digit 4 is in the thousands place:
 $4 \times 10,000 = 40,000$.

Practice Exercise 1

Solutions

1. Total value of colored digits:

- (a) $576,234 \rightarrow 70000$
- (b) $40,678,921 \rightarrow 40,000,000$
- (c) $12,409,826 \rightarrow 0,000$
- (d) $978,246,930 \rightarrow 900,000,000$
- (e) $74,892,365 \rightarrow 4,000,000$

2. Place value of digit 1 in 168,942,750:

• 1 is in the hundred-millions place:
 $1 \times 100,000,000 = 100,000,000$.

3. Total value of digit 3 in 378,642,051:

• 3 is in the hundred-millions place:
 $3 \times 100,000,000 = 300,000,000$.

4. Total value of digit 8 in 286,014,507

• 8 is in the ten-millions place:
 $8 \times 10,000,000 = 80,000,000$.

5. Place value of digit 7 in 15,827,304:

• 7 is in the thousands place:
 $7 \times 1,000 = 7,000$.

6. Total value of digit 6 in 26,274,001:

• is in the millions place:
 $6 \times 10,000,000 = 6,000,000$

7. Place value of digit 8 in 780,064:

• 8 is in the ten-thousands place:
 $8 \times 10,000 = 80,000$.

8. Total value of digit 6 in 6,490,875:

• 6 is in the millions place:
 $6 \times 1,000,000 = 6,000,000$.

9. Difference between the total values of digit 7 and in 81,736,409:

- 7 is in the hundred-thousands place:
 $7 \times 100,000 = 700,000$.
- 3 is in the ten-thousands place:
 $3 \times 10,000 = 30,000$.
- **Difference:** $700,000 - 30,000 = 670,000$.

10. Place value of digit 3 in the product of 4795 and 28:

First, calculate:
 $4795 \times 28 = 134,260$.

• Digit 3 is in the ten-thousands place:
 $3 \times 10,000 = 30,000$.

11. How many times is the value of digit 6 greater than digit 3 in 76,413,289:

- Value of 6: $6 \times 1,000,000 = 6,000,000$.
- Value of 3: $3 \times 1,000 = 3,000$.
- **How many times greater:**
 $6,000,000 / 3000 = 2,000$ times.

Activity 3

1. **Read and Write the Number Cards into Symbols**

1. **Seventeen million three hundred and sixty-seven thousand two hundred and one**

○ Symbol: 17,367,201

2. **Twenty-six million four hundred and seventy-two thousand and sixteen**

○ Symbol: 26,472,016

3. **Three hundred and forty-six million one hundred and ninety-seven thousand six hundred and thirty-four**

○ Symbol: 346,197,634

4. **One hundred and five million two hundred and ten thousand one hundred and twenty-nine.**

○ Symbol: 105,210,129

2. **Pick the Number Card at Random, Read, and Write in Symbols.**
1. **Sixty-seven million five hundred and twenty-three thousand and twenty-six**
 - **Symbol: 67,523,026**

2. **Nine hundred and ninety-nine million nine hundred and ninety-nine thousand nine hundred and ninety-nine**
 - **Symbol: 999,999,999**

Practice Exercise 2

1. **Read and Write the Following Numbers in Symbols**
 - (a) **Seventeen million six hundred and forty-six thousand three hundred and two.**
 - **Symbol: 17,646,302**
 - (b) **Eight hundred and sixty-one million four hundred and thirty-six thousand two hundred and eighteen.**
 - **Symbol: 861,436,218**
 - (c) **Two hundred and thirty-four million one hundred and eighty-two thousand one hundred and nineteen.**
 - **Symbol: 234,182,119**

2. **Number of Fingerlings in the Dam**
One hundred million six hundred and ten thousand one hundred and sixteen
 - **Symbol: 100,610,116**

3. **Packets of Cement Produced by the Factory**
Ninety-six million three hundred and fifty-three thousand eight hundred and four.
 - **Symbol: 96,353,804**

4. **Tree Seedlings Planted in the Semi-Desert**
Two hundred and six million one hundred and sixteen thousand and forty-two
 - **Symbol: 206,116,042**

5. **Population of Monkeys in West Africa**
One hundred and two million three hundred and four thousand two hundred and twenty
 - **Symbol: 102,304,220**
6. **People in the Crusade**
Three hundred and seven thousand four hundred and twenty-seven
 - **Symbol: 307,427**
7. **People in the Hunger-Stricken County**
One hundred and six thousand three hundred and fifty-eight
 - **Symbol: 106,358**
8. **Tree Seedlings Given Out by the Governor**
Forty-eight thousand six hundred and two
 - **Symbol: 48,602**
9. **Shoes Produced by the Leather Shoe Processing Company**
Two hundred and forty-four million seven hundred and thirty-six thousand eight hundred and two.
 - **Symbol: 244,736,802**
10. **People Affected by Floods in 2023**
One hundred and ninety-eight million three hundred and fifty-five thousand seven hundred and thirteen.
 - **Symbol: 198,355,713**

Practice Exercise 3

1. (a) 7,640,386: Seven million six hundred and forty thousand three hundred and eighty-six.
(b) 1,234,689: One million two hundred and thirty-four thousand six hundred and eighty-nine.
(c) 3,706,369: Three million seven hundred and six thousand three hundred and sixty-nine.
(d) 9,649,696: Nine million six hundred and forty-nine thousand six hundred and ninety-six.

2. (i) 6,450,620: Six million four hundred and fifty thousand six hundred and twenty shillings.
- (ii) 1,236,410: One million two hundred and thirty-six thousand four hundred and ten shillings.
- (iii) 850,460: Eight hundred and fifty thousand four hundred and sixty shillings.

3. Coffee Exported

8,646,339: Eight million six hundred and forty-six thousand three hundred and thirty-nine tonnes.

4. Milk Collected

6,452,302: Six million four hundred and fifty-two thousand three hundred and two litres.

5. Glass Bottles Produced

4,362,001: Four million three hundred and sixty-two thousand and one glass bottles.

6. Largest and Smallest Numbers from Digits

(a) **Smallest Number:** 0,346,789

- **In Words:** Three hundred and forty-six thousand seven hundred and eighty-nine.

(b) **Largest Number:** 9,876,430

- **In Words:** Nine million eight hundred and seventy-six thousand four hundred and thirty.

7. Sanitary Towels Donated

74,804,629: Seventy-four million eight hundred and four thousand six hundred and twenty-nine sanitary towels.

8. Central Bank of Kenya Funding

70,691,483: Seventy million six hundred and ninety-one thousand four hundred and eighty-three shillings.

9. Read and Write the Numbers in Words

(a) 909,909,699: Nine hundred and nine million nine hundred and nine thousand six hundred and ninety-nine.

- (b) 6,438,756: Six million four hundred and thirty-eight thousand seven hundred and fifty-six.
- (c) 4,268,379: Four million two hundred and sixty-eight thousand three hundred and seventy-nine.
- (d) 9,631,497: Nine million six hundred and thirty-one thousand four hundred and ninety-seven.
- (e) 88,088,888: Eighty-eight million eighty-eight thousand eight hundred and eighty-eight.
- (f) 66,666,066: Sixty-six million six hundred and sixty-six thousand sixty-six.

10. Amount Paid by Mr. Jasper

69,783,650: Sixty-nine million seven hundred and eighty-three thousand six hundred and fifty shillings.

Practice Exercise 4

1. Round to the nearest tens of millions:
 - o (a) **186,439,675** → **190,000,000**
 - o (b) **356,429,809** → **360,000,000**
 - o (c) **778,400,926** → **780,000,000**
 - o (d) **234,067,080** → **230,000,000**
2. **76,342,999** rounded to the nearest tens of millions → **80,000,000**
3. **229,736,178** rounded to the nearest hundreds of millions → **200,000,000**
4. **326,418,969** rounded to the nearest millions → **326,000,000**
5. **69,422,506** rounded to the nearest tens of millions → **70,000,000**
6. **899,984,007** rounded to the nearest hundreds of millions → **900,000,000**
7. Round to the nearest hundreds of millions:
 - (a) **681,467,385** → **700,000,000**
 - (b) **99,966,606** → **100,000,000**
 - (c) **178,500,649** → **200,000,000**
 - (d) **203,869,745** → **200,000,000**
 - (e) **837,499,566** → **800,000,000**
 - (f) **338,649,780** → **300,000,000**
8. **568,732,492** rounded to the nearest hundreds of millions → **600,000,000**
9. **846,732,925** rounded to the nearest hundreds of millions → **800,000,000**
10. **755,000,601** rounded to the nearest tens of millions → **760,000,000**

Practice Exercise 5

Answers

1. Number Identification

(a) Even Numbers Between 200 and 300

202,204,206,208,210,212,214,216,218,220,222,
,224,226,228,230,232,234,236,238,240,242,24
4,246,248,250,252,254,256,258,260,262,264,2
66,268,270,272,274,276,278,280,282,284,286,
288,290,292,294,296,298.

(b) Odd Numbers Between 300 and 400

301,303,305,307,309,311,313,315,317,319,321
,323,325,327,329,331,333,335,337,339,341,34
3,345,347,349,351,353,355,357,359,361,363,3
65,367,369,371,373,375,377,379,381,383,385,
387,389,391,393,395,397,399.

(c) Prime Numbers Between 60 and 100

61,67,71,73,79,83,89,97.

2. Numbers of Wild Animals

(a) **Even Numbers:** 206,452.

(b) **Odd Numbers:** 67,693,87,111,209.

(c) **Prime Numbers:** 67,209.

3. Numbers of Patients

(a) Adults

(i) **Even Numbers:** 104, 66,136, 48

(ii) **Odd Numbers:** 137,77,97,51,141,39,249,
81,127,85.

(iii) **Prime Numbers:** 137,97,127.

(b) Youth

(i) **Even Numbers:** 64,38,54, 76, 24

(ii) **Odd Numbers:**
49,67,13,59,29,89,53,21,63.

(iii) **Prime Numbers:** 67,13,59,29,89,53

(c) Children

(i) **Even Numbers:** 276,166,128

(ii) **Odd Numbers:** 145,135,183,69, 279

(iii) **Prime Numbers:** 103.

4. Prime Numbers Between 60 and 200

61,67,71,73,79,83,89,97,101,103,107,109,113,
127,131,137,139,149,151,157,163,167,173,179
,181,191,193,197,199.

5. Pairs of Days with Even Number of Absent Learners

• **Total Learners:** 41

• **Absent Learners:**

○ Monday: $41 - 38 = 3$ (Odd)

○ Tuesday: $41 - 37 = 4$ (Even)

○ Wednesday: $41 - 39 = 2$ (Even)

○ Thursday: $41 - 36 = 5$ (Odd)

○ Friday: $41 - 33 = 8$ (Even)

⊞ **Answer: B. Tuesday and Friday.**

6. Largest 5-Digit Number with Digits 9, 5, 8, 2, 4

• **Largest Number:** 98,542.

• **In Words:** Ninety-eight thousand five hundred and forty-two.

7. $\text{Odd} \times \text{Odd} = \text{Odd}$

Answer: Odd.

8. $\text{Even} \times \text{Even} = \text{Even}$

Answer: Even.

9. $\text{Even} \times \text{Odd} = \text{Even}$

Answer: Even.

10. Work Out and Identify

(a) $27 + 15 = 42$: Even.

(b) $32 + 48 = 80$: Even.

(c) $12 + 37 = 49$: Odd.

Practice Exercise 6:

Addition of Whole Numbers

1. Add the following numbers

(a) $3462 + 8642 = 12,104$

(b) $17,964 + 38,697 = 56,661$

(c) $48,009 + 67,008 = 115,017$

(d) $879,625 + 60,076 = 939,701$

2. Total Votes Cast

Total votes = $6,346,709 + 5,069,276 + 976,206 + 23,462 = 12,415,653$

3. Coffee Berries Exported

Total = $164,361 + 694,797 + 384,692 + 796,438 = 2,040,288$ tonnes

4. Disbursement of County Funds
 (a) Total = $123,436,800 + 232,749,205 = 356,186,005$
 (b) **Dummy Cheque:**
 Amount in words: **Three hundred fifty-six million one hundred eighty-six thousand and five shillings only.**
5. Total Votes by Two Candidates
 Votes = $7,602,000 + 7,402,000 = 15,004,000$

Practice Exercise 7:

Subtraction of Whole Numbers

1. Subtract
 (a) $96,422 - 78,294 = 18,128$
 (b) $123,642 - 76,206 = 47,436$
 (c) $870,091 - 60,876 = 809,215$
 (d) $692,067 - 486,989 = 205,078$
2. Goats Remaining
 Remaining goats =
 $3,472,119 - 1,364,119 = 2,108,000$
3. Cartons Transported
 Difference = $32,402 - 18,446 = 13,956$
Ahmed transported more cartons by 13,956.
4. Fruits Remaining
 Remaining fruits = $7,648 - 1,999 = 5,649$
5. Planted Trees
 Planted trees = $56,208,101 - 36,406,123 = 19,801,978$

Practice Exercise 8:

Multiplication of Whole Numbers

1. Multiply

- (a) $346 \times 32 = 11,072$
 (b) $1,467 \times 123 = 180,441$
 (c) $47,623 \times 106 = 5,048,038$
 (d) $8,342,390 \times 2,462 = 20,538,964,180$
2. Pineapples in Plantation
 Pineapples = $76,450 \times 3,462 = 264,669,900$

3. Milk Collected in Centres
 Milk = $34,680 \times 276 = 9,571,680$ litres
4. Tree Seedlings Planted
 Seedlings = $6,489 \times 36 = 233,604$
5. Beads in School Containers
 Beads = $76 \times 1,004 = 76,304$
6. Seedlings Distributed
 Seedlings = $112 \times 6,400 = 716,800$

Practice Exercise 9:

Division of Whole Numbers

1. Divide
 (a) $1,600 \div 25 = 64$
 (b) $1,210 \div 22 = 55$
 (c) $4,514 \div 37 = 122$
 (d) $920,808 \div 252 = 3,654$
2. School Grants
 Amount per school = $6,340,660 \div 20 = 317,033$
3. Lorry Trips
 Trips = $568,260 \div 4,620 = 123$
4. Trays of Eggs
 Trays = $219,480 \div 30 = 7,316$
5. Adults in Fundraising
 Adults = $472,500 \div 450 = 1,050$
6. Rice per Family
 Rice = $11,328 \div 236 = 48$ kilograms

Practice Exercise 10

1. Find the value of the following:

- (a) $648 - 786 + 216 = 78$
 (b) $15 + (36 + 9) - 18 \div 9 = 58$
 (c) $880 \div 220 \times 4 + 70 - 4 = 82$
 (d) $360 \div 180 \times 2 \times 72 - 44 = 244$
 (e) = 2
 (f) = 9

2. Visual Arts Teacher's Beads

Total beads = 144, shared among 16 learners.
 $144 \div 16 = 9$ beads.

3. Parent's Money

Each of 6 children received 60 sh.

Amount given to children:

$$6 \times 60 = 360 \text{ sh.}$$

The parent was left with 1200 sh.

Amount at the beginning:

$$360 + 1200 = 1560 \text{ sh.}$$

4. School Exercise Books

There are 640 learners. Each book costs 480 shillings. Total cost of books:

$$640 \times 480 = 307,200 \text{ sh.}$$

Per stream:

$$307,200 \div 16 = 19,200 \text{ sh per stream.}$$

5. Farm Planting Seedlings

First day:

20 workers, each planting 12 seedlings:

$$20 \times 12 = 240 \text{ seedlings.}$$

Second day:

Half of the workers (10 workers), each

planting 18 seedlings:

$$10 \times 18 = 180 \text{ seedlings.}$$

Total seedlings planted:

$$240 + 180 = 420 \text{ seedlings.}$$

6. Value of Expression

Answer = 15

7. Exercise Books for Grade 7 Learners

Each carton has 96 books. There are 4 cartons:

$$\text{Total books} = 4 \times 96 = 384 \text{ books.}$$

Each learner gets 12 books:

$$\text{Number of learners} =$$

$$384 \div 12 = 32 \text{ learners.}$$

8. Expression:

$$72 \div 6 \times 8 - 4 + 13 = 105$$

9. Expression:

$$^2/3 \times (8 \times 4) + 9 \div 3 = 23\frac{1}{3}$$

10. Expression:

$$48 \times 6 + 12 \div 4 = 291$$

Practice Exercise 11

1. Identify the sequence and determine the next numbers in the patterns:

(a) **2, 5, 10, 13, 18, 21, __, __**

The pattern alternates between adding 3 and 5:

So, the next two numbers are **26, 29**.

(b) **3, 4, 8, 13, 22, 36, __, __**

The differences between the numbers are increasing:

The next two numbers are **56, 82**.

(c) **7, 14, 28, 56, 112, __, __**

Each number is multiplied by 2:

So, the next two numbers are **224, 448**.

(d) **3, 6, 12, 24, 48, __, __**

Each number is multiplied by 2:

So, the next two numbers are **96, 192**.

2. What is the next number in the patterns:

(a) **12, 24, 72, 144, 432, __, __**

Each number is multiplied by 2 and 3:

So, the next two numbers are **864, 2592**.

(b) **4, 9, 25, 49, 121, 169, __, __**

These are squares of consecutive prime numbers:

So, the next two numbers are **289, 361**.

3. What is the next two numbers in the pattern:

361, 529, 841, 961, __, __

These are consecutive perfect squares:

So, the next two numbers are **1369, 1681**.

4. What is the sum of the next two digits in the pattern?

1, 5, 9, 13, 17, __, __

The pattern increases by 4 each time:

Next two digits:

21, 46

5. Find the next number in the following sequence:

(a) **1, 2, 4, 7, 11, __, __**

The differences between the numbers are increasing by 1:

So, the next two numbers are **16, 22**.

(b) **121, 100, 81, 64, __, __**

These are perfect squares of consecutive integers in reverse order:

So, the next two numbers are **49, 36**.

(c) **1, 3, 9, 27, __**

Each number is multiplied by 3:

So, the next number is **81**.

Practice Exercise 12

1. Form a sequence by adding 125 to the number given. Show your sequence.

(a) **120, __, __, __, __, __**

Add 125 to each number:

So, the sequence is **120, 245, 370, 495, 620, 745**.

(b) **3,200, __, __, __, __, __**

Divide 3,200 by 2, and then continue to add 2 (forming a halving sequence):

So, the sequence is **3,200, 1,600, 800, 400, 200, 100**.

(c) **6,000, __, __, __, __, __, __**

Subtract 111 each time

So, the sequence is **6,000, 5,889, 5,778, 5,667, 5,556, 5,445, 5,334**.

2. A fruit vendor had 7 baskets of different sizes. She packed oranges in the baskets as shown.

Basket A	Basket B	Basket C	Basket D	Basket E	Basket F	Basket G
6	12	18	24	30	36	42

The number of oranges in each basket increases by 6:

So, the number of oranges in Basket F is **36**, and in Basket G is **42**.

3. Form two patterns involving:

(a) **Addition**

(i) 5, 8, 11, 14, 17, __, __ (Add 3)

(ii) 10, 15, 20, 25, 30, __, __ (Add 5)

(b) **Subtraction**

(i) 50, 45, 40, 35, 30, __, __ (Subtract 5)

(ii) 100, 95, 90, 85, 80, __, __ (Subtract 5)

(c) **Multiplication**

(i) 2, 4, 8, 16, 32, __, __ (Multiply by 2)

(ii) 3, 6, 12, 24, 48, __, __ (Multiply by 2)

(d) **Division**

(i) 81, 27, 9, 3, 1, __, __ (Divide by 3)

(ii) 64, 32, 16, 8, 4, __, __ (Divide by 2)

4. The following number cards show the number of trees grown by the wildfire club members in a period of five years.

4400, 3800, 4200, 3600, 4000

a) **Arrange the numbers from the smallest to the largest to form a sequence.**

The sequence is **3600, 3800, 4000, 4200, 4400**.

b) **Which is the next number of trees in the sequence?**

The pattern increases by 200 after each number.

Next number would be:

$4400 + 200 = 4600$.

5. Create three patterns that involve square:

- **Pattern 1** (Square of numbers increasing by 1):

$1^2 = 1, 2^2 = 4, 3^2 = 9, 4^2 = 16, 5^2 = 25, _, _$

Next numbers: $6^2 = 36, 7^2 = 49$

- **Pattern 2** (Square of even numbers):

$2^2 = 4, 4^2 = 16, 6^2 = 36, 8^2 = 64, 10^2 = 100,$

$_, _$

Next numbers: $12^2 = 144, 14^2 = 196$

- **Pattern 3** (Square of multiples of 3):

$3^2 = 9, 6^2 = 36, 9^2 = 81, 12^2 = 144, 15^2 = 225,$

$_, _$

Next numbers: $18^2 = 324, 21^2 = 441$

1.2 Factors

Practice Exercise 13

1. Which of the following numbers are divisible by 2?

To determine if a number is divisible by 2, it must end in an even number (0, 2, 4, 6, or 8).

- (i) **176** – Ends in 6, so it is divisible by 2.
- (ii) **89** – Ends in 9, so it is **not** divisible by 2.
- (iii) **202** – Ends in 2, so it is divisible by 2.
- (iv) **63** – Ends in 3, so it is **not** divisible by 2.
- (v) **466** – Ends in 6, so it is divisible by 2.
- (vi) **12349** – Ends in 9, so it is **not** divisible by 2.
- (vii) **23640** – Ends in 0, so it is divisible by 2.
So, the numbers divisible by 2 are: **176, 202, 466, 23640.**

2. Which of the following numbers are divisible by two?

- (i) **36428** – Ends in 8, so it is divisible by 2.
- (ii) **1640007** – Ends in 7, so it is **not** divisible by 2.
- (iii) **23648076** – Ends in 6, so it is divisible by 2.
- (iv) **36891649** – Ends in 9, so it is **not** divisible by 2.

So, the numbers divisible by 2 are: **36428, 23648076.**

3. In which zones is the amount of money given divisible by 2?

To check divisibility by 2, we look at the last digit of the amount.

- **Zone A: sh.36485** – Ends in 5, so it is **not** divisible by 2.
- **Zone B: sh.136436** – Ends in 6, so it is divisible by 2.
- **Zone C: sh.48363** – Ends in 3, so it is **not** divisible by 2.
- **Zone D: sh.126108** – Ends in 8, so it is divisible by 2.

So, the zones where the amount of money is divisible by 2 are **Zone B** and **Zone D.**

Practice Exercise 14

1. Which of the following numbers are divisible by 3?

To check divisibility by 3, sum the digits of the number. If the sum is divisible by 3, then the number is divisible by 3.

(i) **3693**

Sum of digits: $3+6+9+3=21$

Since 21 is divisible by 3, **3693 is divisible by 3.**

(ii) **936482**

Sum of digits: $9+3+6+4+8+2=32$

Since 32 is **not** divisible by 3, **936482 is not divisible by 3.**

(iii) **104676**

Sum of digits: $1+0+4+6+7+6=24$

Since 24 is divisible by 3, **104676 is divisible by 3.**

(iv) **4503063**

Sum of digits: $4+5+0+3+0+6+3=21$

Since 21 is divisible by 3, **4503063 is divisible by 3.**

(v) **135**

Sum of digits: $1+3+5=9$

Since 9 is divisible by 3, **135 is divisible by 3.**

(vi) **6783**

Sum of digits: $6+7+8+3=24$ + $7 + 8 + 3 = 24$
 $24+7+8+3=24$

Since 24 is divisible by 3, **6783 is divisible by 3.**

So, the numbers divisible by 3 are: **3693, 104676, 4503063, 135, 6783.**

2. Which machines produced a number of packets divisible by 3?

For divisibility by 3, we sum the digits of the packet number. If the sum is divisible by 3, the number is divisible by 3.

- **Machine A: 16458 packets**

Sum of digits: $1+6+4+5+8=24$

- Since 24 is divisible by 3, **Machine A produced divisible packets.**

- **Machine B: 27284 packets**
Sum of digits: $2+7+2+8+4=23$
Since 23 is **not** divisible by 3, **Machine B did not produce divisible packets.**
 - **Machine C: 32432 packets**
Sum of digits: $3+2+4+3+2=14$
Since 14 is **not** divisible by 3, **Machine C did not produce divisible packets.**
 - **Machine D: 28644 packets**
Sum of digits: $2+8+6+4+4=24$
Since 24 is divisible by 3, **Machine D produced divisible packets.**
 - **Machine E: 26488 packets**
Sum of digits: $2+6+4+8+8=28$
Since 28 is **not** divisible by 3, **Machine E did not produce divisible packets.**
So, the machines that produced packets divisible by 3 are: **Machine A** and **Machine D.**
3. **In which months were the amounts of milk delivered divisible by 3?**
For divisibility by 3, we sum the digits of the amount of milk delivered in each month.
- **January: 9642 litres**
Sum of digits: $9+6+4+2=21$
Since 21 is divisible by 3, **January** is divisible by 3.
 - **February: 10234 litres**
Sum of digits: $1+0+2+3+4=10$
Since 10 is **not** divisible by 3, **February** is not divisible by 3.
 - **March: 9883 litres**
Sum of digits: $9+8+8+3=28$
Since 28 is **not** divisible by 3, **March** is not divisible by 3.
 - **April: 8674 litres**
Sum of digits: $8+6+7+4=25$
Since 25 is **not** divisible by 3, **April** is not divisible by 3.
 - **May: 12306 litres**
Sum of digits: $1+2+3+0+6=12$
Since 12 is divisible by 3, **May** is divisible by 3.

So, the months where the amounts of milk delivered are divisible by 3 are **January** and **May.**

4. **Which of the following numbers is divisible by 3?**
For divisibility by 3, sum the digits of the number.
- **A. 3030901**
Sum of digits: $3+0+3+0+9+0+1=16$
Since 16 is **not** divisible by 3, **3030901 is not divisible by 3.**
 - **B. 426092**
Sum of digits: $4+2+6+0+9+2=23$
Since 23 is **not** divisible by 3, **426092 is not divisible by 3.**
 - **C. 6428**
Sum of digits: $6+4+2+8=20$
Since 20 is **not** divisible by 3, **6428 is not divisible by 3.**
 - **D. 1010106**
Sum of digits: $1+0+1+0+1+0+6=9$
Since 9 is divisible by 3, **1010106 is divisible by 3.**
So, the number divisible by 3 is: **D. 1010106.**

Practice Exercise 15

1. **Which of the following numbers are divisible by 4?**
To check divisibility by 4, look at the last two digits of the number. If the number formed by the last two digits is divisible by 4, the whole number is divisible by 4.
- (i) **62024**
Last two digits: 24
Since 24 is divisible by 4, **62024 is divisible by 4.**
- (ii) **478394**
Last two digits: 94
Since 94 is **not** divisible by 4, **478394 is not divisible by 4.**
- (iii) **864964**
Last two digits: 64
Since 64 is divisible by 4, **864964 is divisible by 4.**

- (iv) **364947**
 Last two digits: 47
 Since 47 is **not** divisible by 4, **364947 is not divisible by 4.**
 So, the numbers divisible by 4 are: **62024** and **864964.**

2. **Which containers have a number of beads not divisible by 4?**
 To check divisibility by 4, look at the last two digits of each number.
- **W = 6428**
 Last two digits: 28
 Since 28 is divisible by 4, **W is divisible by 4.**
 - **X = 3604**
 Last two digits: 04
 Since 4 is divisible by 4, **X is divisible by 4.**
 - **Y = 2862**
 Last two digits: 62
 Since 62 is **not** divisible by 4, **Y is not divisible by 4.**
 - **Z = 3468**
 Last two digits: 68
 Since 68 is divisible by 4, **Z is divisible by 4.**
 So, the container with a number of beads **not divisible by 4** is **Y.**

3. **Which plantation had a number of rows divisible by 4?**
 Check the last two digits of each plantation's number of rows.
- **Mwewe Plantation: 68088**
 Last two digits: 88
 Since 88 is divisible by 4, **Mwewe Plantation is divisible by 4.**
 - **Njiwa Plantation: 67866**
 Last two digits: 66
 Since 66 is **not** divisible by 4, **Njiwa Plantation is not divisible by 4.**
 - **Kurguru Plantation: 66418**
 Last two digits: 18
 Since 18 is **not** divisible by 4, **Kurguru Plantation is not divisible by 4.**
 - **Korongu Plantation: 64126**
 Last two digits: 26
 Since 26 is **not** divisible by 4, **Korongu Plantation is not divisible by 4.**

- **Nyigu Plantation: 62794**
 Last two digits: 94
 Since 94 is **not** divisible by 4, **Nyigu Plantation is not divisible by 4.**
 So, the plantation with a number of rows divisible by 4 is: **Mwewe Plantation.**
4. **Which of the following is divisible by 4?**
 Check the last two digits of each number.
- **A. 46842**
 Last two digits: 42
 Since 42 is **not** divisible by 4, **46842 is not divisible by 4.**
 - **B. 363856**
 Last two digits: 56
 Since 56 is divisible by 4, **363856 is divisible by 4.**
 - **C. 24362**
 Last two digits: 62
 Since 62 is **not** divisible by 4, **24362 is not divisible by 4.**
 - **D. 72078**
 Last two digits: 78
 Since 78 is **not** divisible by 4, **72078 is not divisible by 4.**
 So, the number divisible by 4 is: **B. 363856**

Practice Exercise 16.

1. **Which of the following numbers are divisible by 5?**
 To check divisibility by 5, see if the number ends in 0 or 5.
- (i) **2005**
 Since it ends in **5**, **2005 is divisible by 5.**
 - (ii) **13462920**
 Since it ends in **0**, **13462920 is divisible by 5.**
 - (iii) **760764**
 Since it ends in **4**, **760764 is not divisible by 5.**

(iv) **3640295**
Since it ends in **5**, **3640295** is divisible by **5**.

(v) **136497898**
Since it ends in **8**, **136497898** is not divisible by **5**.

So, the numbers divisible by 5 are: **2005**, **13462920**, and **3640295**.

2. Which dummy cheques had the amount divisible by 5?

To check divisibility by 5, look at the last digit. If the last digit is 0 or 5, the amount is divisible by 5.

(i) **Two million three hundred and thirty-six thousand four hundred and five shillings**

Last digit: **5**

Since it ends in 5, it is divisible by 5.

(ii) **One hundred and twenty-seven million three hundred and fifty-six thousand six hundred and fourteen shillings**

Last digit: **4**

Since it ends in 4, it is not divisible by 5.

(iii) **Ninety-six million three hundred and sixty thousand two hundred and seventy shillings**

Last digit: **0**

Since it ends in 0, it is divisible by 5.

(iv) **One million nine hundred and twenty-two thousand eight hundred and six shillings**

Last digit: **6**

Since it ends in 6, it is not divisible by 5.

So, the dummy cheques with amounts divisible by 5 are: (i) and (iii).

3. In which companies are the number of workers divisible by 5?

To check divisibility by 5, see if the number ends in 0 or 5.

• **PTO Company: 3467 workers**

Last digit: **7**

Since it ends in 7, **PTO Company** is not divisible by 5.

• **RTX Company: 4610 workers**

Last digit: **0**

Since it ends in 0, **RTX Company** is divisible by 5.

• **PPM Company: 2805 workers**

Last digit: **5**

Since it ends in 5, **PPM Company** is divisible by 5.

• **KRT Company: 5006 workers**

Last digit: **6**

Since it ends in 6, **KRT Company** is not divisible by 5.

• **MMR Company: 2072 workers**

Last digit: **2**

Since it ends in 2, **MMR Company** is not divisible by 5.

So, the companies with numbers of workers divisible by 5 are: **RTX Company** and **PPM Company**.

4. Which of the following numbers is divisible by 5?

Check the last digit to see if it is 0 or 5.

A. **346809**

Last digit: **9**

Since it ends in 9, **346809** is not divisible by 5.

B. **964208**

Last digit: **8**

Since it ends in 8, **964208** is not divisible by 5.

C. **860400**

Last digit: **0**

Since it ends in 0, **860400** is divisible by 5.

D. **34974**

Last digit: **4**

Since it ends in 4, **34974** is not divisible by 5.

So, the number divisible by 5 is: **C. 860400**.

Practice Exercise 17

1. Which of the following numbers are divisible by 6?

For a number to be divisible by 6, it must be divisible by both 2 and 3.

• (i) **6303**

Since it's not divisible by 2, **6303** is not divisible by 6.

• (ii) **16200**

Since it's divisible by both 2 and 3, **16200 is divisible by 6.**

- **(iii) 3629670**

Since it's divisible by both 2 and 3, **3629670 is divisible by 6.**

- **(iv) 860004**

Since it's divisible by both 2 and 3, **860004 is divisible by 6.**

- **(v) 340869**

Since it's not divisible by 2, **340869 is not divisible by 6.**

So, the numbers divisible by 6 are: **16200, 3629670, and 860004.**

2. **During an election, five candidates vied for a parliamentary seat. The results were as follows:**

Which candidates got a number of votes divisible by 6?

- **Titoc: 136440 votes**

Since it's divisible by both 2 and 3, **136440 is divisible by 6.**

- **Kanino: 276206 votes**

Since it's not divisible by 3, **276206 is not divisible by 6.**

- **Maese: 106404 votes**

Since it's divisible by both 2 and 3, **106404 is divisible by 6.**

- **Painko: 62300 votes**

Since it's not divisible by 3, **62300 is not divisible by 6.**

- **Stanco: 4686 votes**

Since it's divisible by both 2 and 3, **4686 is divisible by 6.**

So, the candidates who got votes divisible by 6 are: **Titoc, Maese, and Stanco.**

3. **Which of the following numbers is divisible by 6?**

- **A. 303060**

Since it's divisible by both 2 and 3, **303060 is divisible by 6.**

- **B. 4126021**

Since it's neither divisible by 2 nor 3, **4126021 is not divisible by 6.**

- **C. 909643**

Since it's neither divisible by 2 nor 3, **909643**

is not divisible by 6.

- **D. 3209402**

Since it's divisible by 2 but not by 3, **3209402 is not divisible by 6.**

So, the number divisible by 6 is: **A. 303060.**

Practice exercise 18

1. **Answer:** The numbers **36408, 1000648, and 1602904** are divisible by 8.
2. **Answer:** Lorries **Q (12608), R (15432), and V (24048)** had masses divisible by 8.
3. **Answer:** The number **801064** is divisible by 8.

Practice Exercise 19

1. **762093, 63063072, 333303300**
2. **36728100, 167967, 702603702**
3. **4055049**

Practice Exercise 20

1. **7084260, 370386040, 806491270**
2. **4030201070**

Practice Exercise 21

1. (i) **34650**
(ii) **1264978**
2. (i) **2**
(ii) **5**
(iii) **2**
3. (i) **4**
(ii) **8**
(iii) **2**
4. **649, 407, 869, 308**
5. **3**

Practice Exercise 22

1. (i) **16 = 2x2x2x2** (ii) **24 = 2x2x2x3**
(i) **27 = 3x3x3** (ii) **36 = 2x2x3x3**
(i) **15 = 3x5** (ii) **30 = 2x3x5**
(i) **28 = 2x2x7** (ii) **35 = 5x7**
(i) **36 = 2x2x3x3** (ii) **48 = 2x2x2x2x3**
(i) **39 = 3x13** (ii) **63 = 3*3*7**
2. (i) **14 = 2x7** (ii) **28 = 2x2x7** (iii) **49 = 7x7**
ii. (i) **9 = 3x3** (ii) **12 = 2x2x3** (iii) **18 = 2x3x3**
iii. (i) **14 = 2x7** (ii) **21 = 3x7** (iii) **35 = 5x7**
iv. (i) **18 = 2x3x3**

- (ii) $24=2 \times 2 \times 2 \times 3$
 (iii) $36=2 \times 2 \times 3 \times 3$
- v. (i) $32=2 \times 2 \times 2 \times 2 \times 2$
 (ii) $36=2 \times 2 \times 3 \times 3$
 (iii) $44=2 \times 2 \times 11$
- vi. (i) $16=2 \times 2 \times 2 \times 2$
 (ii) $32=2 \times 2 \times 2 \times 2 \times 2$
 (iii) $64=2 \times 2 \times 2 \times 2 \times 2 \times 2$
3. (i) $17=1 \times 17$ (ii) $34=2 \times 17$
 (iii) $68=2 \times 2 \times 17$
4. (i) $9=3 \times 3$ (ii) $18=2 \times 3 \times 3$
 (iii) $27=3 \times 3 \times 3$

Practice Exercise 23

1. (i) 14
 (ii) 18
 (iii) 3
 (iv) 8
 (v) 7
 (vi) 9
 (vii) 30
2. (i) 6
 (ii) 27
 (iii) 32
 (iv) 9
 (v) 42
3. 36
4. (i) 12
 (ii) 16
 (iii) 8
 (iv) 7
5. (i) 9
 (ii) 12
 (iii) 8
 (iv) 120
6. 6 litres

Practice Exercise 24

1. 112, 66, 68, 216, 192, 168
 2. 36, 60, 48, 162, 180
 3. 112, 96, 216
 4. 120

Practice Exercise 25

Final Answers:

1. 6 litres
 2. 25th June 2022
 3. 24 cm

4. 8:31pm
 5. 42
 6. 11:30am
 7. 8 kg
 8. 3am

1.3 Fractions

Practice Exercise 26

1. (i) $\frac{1}{6}, \frac{1}{4}, \frac{2}{3}$
 (ii) $\frac{4}{5}, \frac{5}{6}, \frac{7}{8}$
 (iii) $\frac{1}{8}, \frac{1}{6}, \frac{1}{3}$
 (iv) $\frac{1}{4}, \frac{3}{8}, \frac{2}{5}$
2. (i) $\frac{9}{40}, \frac{4}{5}, \frac{3}{10}$
 (ii) $\frac{7}{12}, \frac{1}{3}, \frac{1}{4}$
 (iii) $\frac{17}{20}, \frac{7}{10}, \frac{9}{20}$
 (iv) $\frac{5}{9}, \frac{2}{5}, \frac{1}{3}$
 (v) $\frac{3}{4}, \frac{5}{9}, \frac{5}{12}$
 (vi) $\frac{8}{9}, \frac{7}{8}, \frac{5}{6}$
3. $\frac{1}{5}, \frac{13}{60}, \frac{1}{4}, \frac{1}{3}$
4. $\frac{2}{3}, \frac{5}{8}, \frac{3}{5}, \frac{1}{6}$

Practice Exercise 27

1. Work out the following:

- (i) $\frac{23}{30}$
 (ii) $1 \frac{7}{40}$
 (iii) $\frac{101}{168}$
 (iv) $\frac{9}{10}$
 (v) $\frac{21}{22}$
 (vi) $1 \frac{1}{24}$

2. Work out the following:

- (i) $\frac{11}{14}$
 (ii) $1 \frac{7}{26}$
 (iii) $\frac{2}{3}$

3. $\frac{3}{4}$ of the book in the first three days.

4. $\frac{3}{8}$

5. $\frac{17}{18}$

6. $\frac{17}{24}$ represented adults and youths.

7. $13 \frac{7}{20}$

8. $23\frac{11}{12}$
9. $1\frac{9}{40}$
10. $65\frac{3}{4}$

Practice Exercise 28

1. (i) $\frac{7}{18}$
(ii) $\frac{1}{3}$
(iii) $\frac{5}{14}$
(iv) $\frac{11}{36}$
(v) $\frac{1}{9}$
(vi) $\frac{13}{22}$
2. (i) $\frac{1}{24}$
(ii) $\frac{26}{45}$
3. $\frac{1}{8}$
4. $\frac{1}{12}$
5. $\frac{1}{4}$

Practice Exercise 29

Solutions:

1. (i) 40
(ii) 21
(iii) $\frac{11}{12}$
(iv) 21
2. (i) $1\frac{3}{4}$
(ii) $1\frac{5}{49}$
(iii) $\frac{1}{12}$
(iv) 85
(v) 45
3. (i) $\frac{4}{9}$
(ii) 21
(iii) 1
(iv) 90
4. • Total mass: $24 \times 2 = 48$ kg
5. $200 \times 1\frac{3}{2} = 1300$ Kgs

Practice Exercise 30

Solutions:

1. (i) $\frac{7}{2}$
(ii) $\frac{17}{11}$
(iii) 2
(iv) $\frac{34}{27}$
2. (i) $\frac{1}{13}$
(ii) $\frac{1}{7}$

- (iii) $\frac{1}{21}$
- (iv) $\frac{1}{38}$

3. (i) $\frac{4}{7}$
(ii) $\frac{7}{34}$
(iii) $\frac{5}{58}$
(iv) $\frac{4}{89}$
4. $\frac{4}{23}$
5. $\frac{1}{84}$
6. $\frac{5}{37}$
7. $\frac{5}{37}$

Practice Exercise 31

1. (i) $\frac{1}{36}$
(ii) $\frac{1}{81}$
(iii) $\frac{1}{361}$
(iv) $\frac{1}{52}$
(v) $\frac{5}{128}$
2. $\frac{2}{25}$
3. $\frac{8}{25}$ m of sugarcane.
4. **What is the value of the following?**
(i) 2
(ii) $1\frac{3}{4}$
(iii) 1
(iv) 1
(v) $2\frac{2}{3}$
5. $\frac{9}{8}$
6. $5\frac{3}{25}$
7. **Find the value of the following:**
(i) $\frac{3}{8}$
(ii) $\frac{1}{4}$
(iii) $\frac{3}{8}$
(iv) $\frac{169}{1568}$
(v) $1\frac{19}{128}$
8. He got 34 pieces.
9. **Grade 7 learners in Bidii school used digital devices to work out the following. What did they get?**
(i) $\frac{222}{343}$
(ii) $2\frac{23}{160}$
10. $17\frac{1}{7}$ packets of sugar.

Practice Exercise 32

Work out the following:

- (i) 36
 - (ii) 140
 - (iii) 169
 - (iv) 468
 - (v) $105\frac{5}{8}$
2. The shopkeeper obtained 150 packets.
 3. The carpenter got 720 pieces.
 4. There were 9 learners.
 5. The farmer obtained 125 packets.
 6. There were 4445 schools.

Practice Exercise 33

1. (i) $2\frac{2}{3}$, $3\frac{1}{6}$
(ii) 2, $2\frac{1}{2}$
(iii) $\frac{1}{48}$, $\frac{1}{96}$
(iv) $2\frac{2}{3}$, 2
2. (i) $2\frac{1}{4}$, $3\frac{3}{8}$
(ii) $\frac{7}{60}$, $\frac{7}{72}$
(iii) $4\frac{1}{2}$, $5\frac{1}{4}$, $6\frac{3}{4}$
3. Identify the sequence and determine the missing numbers in the pattern:
 - $\frac{1}{16}$

Practice Exercise 34

1. (i) $1\frac{1}{4}$, $1\frac{3}{8}$
(ii) $\frac{1}{36}$, $\frac{1}{49}$
(iii) $1\frac{2}{3}$, 2
(iv) $20\frac{1}{4}$, $60\frac{3}{4}$
(v) 1, $\frac{7}{8}$

For questions 2 and 3 learner's to form correct sequences using the given fractions.

1.4 Decimals

Practice Exercise 35

1. What is the place value of digit 8 in the numbers below?
 - (i) 36.0842
 - The digit 8 is in the **hundredths** place.
 - (ii) 121.376482

- The digit 8 is in the **hundred thousandths** (iii) 410.000648
 - The digit 8 is in the **millionths** place.
2. A Grade 7 learner used a calculator to divide a decimal number by a decimal number. She got her answer as 336.346769. What is the place value of digit 9?
 - The digit 9 is in the **millionths** place.
 3. A teacher of mathematics wrote the number 846.06724. He asked learners to determine the place value of digit 7. What was their answer?
 - The digit 7 is in the **thousandths** place.
 4. What is the place value of digit 0 in the number 87.96403?
 - The digit 0 is in the **ten-thousandths** place.
 5. The mass of a guinea pig is 1.29647 kg. What is the place value of digit 7 in its mass?
 - The digit 7 is in the **hundred-thousandths**

Practice Exercise 36

1. What is the total value of digit 7 in the numbers below?
 - (i) 3.0678
 - The digit 7 is in the **thousandths** place, so its value is **0.007**.
 - (ii) 112.940278
 - The digit 7 is in the **hundred thousandths place**, so its value is **0.00007**.
 - (iii) 99.02989073
 - The digit 7 is in the **ten millionths** place, so its value is **0.000007**.
 - (iv) 446.00468709
 - The digit 7 is in the **millionths** place, so its value is **0.000007**.
 - (v) 83.0374
 - The digit 7 is in the **thousandths** place, so its value is **0.007**.
2. What is the total value of digit 6 in the number 47.004261 written in words?
 - The digit 6 is in the **hundred-thousandths** place, so its value is **0.00006**.

3. **A Grade 7 learner converted a fraction into a decimal number and got 0.857142. What is the total value of digit 1 in the answer she got?**
- The digit 1 is in the **ten-thousandths** place, so its value is **0.0001**.
4. **The height of Nyambura is 1.6493m, work out the total value of 9 in the number.**
- The digit 9 is in the **thousandths** place, so its value is **0.009**.
5. **Omanyala ran a distance of 14.18735km during his practice in preparation for the Olympics. What is the total value of digit 5 in the number?**
- The digit 5 is in the **hundred-thousandths** place, so its value is **0.00005**.

Practice Exercise 37

1. **Find out the value:**
- $1.12 \times 6 = 6.72$
 - $2.34 \times 100 = 234$
 - $34.8 \times 60 = 2088$
 - $0.006 \times 60 = 0.36$
 - $1.0072 \times 22 = 22.1584$
 - $0.0004 \times 120 = 0.048$
2. **Amina had 20 bags of maize, each with a mass of 5.85 kg. What was the total mass?**
- Total mass = $20 \times 5.85 = 117$
3. **Each of Grade 7 learner's rabbits weighs 2.42 kg. If they have 200 rabbits, what is their total mass?**
- Total mass = $200 \times 2.42 = 484$
4. **Anita bought 10.346 litres of milk. Mukami bought fifteen times as much as Anita. How much milk did Mukami buy?**
- Total milk Mukami bought = $15 \times 10.346 = 155.19$ litres
5. **In an Agriculture project, Grade 7 learners measured the height of each of 100 tomato seedlings as 10.125 cm. What was their total height?**
- Total height = $100 \times 10.125 = 1012.5$ cm

Practice Exercise 38

1. **Work out:**
- $1.6 \times 0.4 = 0.64$
 - $0.8 \times 0.3 = 0.24$
 - $15.4 \times 2.8 = 43.12$
 - $0.08 \times 0.23 = 0.0184$
 - $2.7 \times 2.614 = 7.0578$
 - $6.39 \times 1.4 = 8.946$
 - $0.93 \times 1.84 = 1.7112$
 - $0.51 \times 0.36 = 0.1836$
 - $36.4 \times 20.3 = 738.92$
2. **Find the area of a square whose side is 4.16 cm.**
- Area of square = $4.16 \times 4.16 = 17.3056 \text{ cm}^2$
3. **During an art lesson, pupils were provided with rectangular paper cutouts. What was the area of each paper cutout if the length was 6.43 cm and the width was 2.2 cm?**
- Area of rectangle = length \times width = $6.43 \times 2.2 = 14.146 \text{ cm}^2$
 - A carpenter bought 10.8 m of wood, if a meter of wood costs sh130.50. How much did he spend?**
 - Total cost = $10.8 \times 130.50 = 1409.40 \text{ sh}$
5. **A shopkeeper sold 60.4 kg of beans at 98.25 per kilogram. How much money did he get from the sale of the beans?**
- Total money = $60.4 \times 98.25 = 5934.3$

Practice Exercise 39

1. **Work out:**
- $0.24 \div 12 = 0.02$
 - $11.7 \div 13 = 0.9$
 - $0.324 \div 18 = 0.018$
 - $0.49 \div 98 = 0.005$
 - $43.20 \div 24 = 1.8$
2. **During Home Science lesson, Grade 7 learners made balls of dough to bake chapati. Each ball had a mass of 200.25g. If the whole dough was 8010g, how many balls of dough did they make?**
- Number of balls = $8010 / 200.25 = 40$

3. During Visual Arts lesson, 120 learners shared 2.4 litres of paint. How much paint did each learner get?

- Amount of paint per learner = $2.4/120=0.02$ litres

4. In a certain village, public health officers administered 0.84 litres of cholera vaccine equally among 240 people. How much did each get?

- Amount of vaccine per person = $0.84/240=0.0035$ litres (or 3.5 ml)

5. The area of a rectangular garden is 840.4 m². Calculate the length of the garden if its width is 16m.

- Area of rectangle = length×width
- length= $840.4/16=52.525$ m

Practice Exercise 40

- (a) $0825/1.1=750$
(b) $63.99\div 0.9=71.1$
(c) $98.234\div 0.8=122.7925$
(d) $0.0049\div 0.07=0.07$
(e) $0.72\div 0.03=24$
(f) $0.64\div 0.4=1.6$
(g) $1.34\div 0.8=1.675$

2. A tailor bought 4.5 m of material for sh 443.25. How much did he spend on 1 m of the material?

- Cost per meter = $443.25/4.5 =98.5$ sh per metre.

3. Mwaura had 8.4 m of wire. He cut it into equal pieces of 0.6 m each. How many pieces of wire did he get?

- Number of pieces = $8.4/0.6 =14$ pieces

4. How many times is the value of digit 6 greater than the value of digit 4 in the number 3.61234?

The value of digit 6 is 15000 times greater than the value of digit 4.

5. During a home science lesson, Mr. John had a string 8.4 m long. He cut it into equal pieces of 0.4 m each. How many pieces of string did he get?

- Number of pieces = $8.4/0.4=21$ pieces

Practice Exercise 41

1. Work out the square of the following numbers:

- $84\times 84=7056$
- $99\times 99=9801$
- $268\times 268=71824$
- $476\times 476=226576$
- $2493\times 2493=6,215049$

2. What is the value of the following:

- $76292\times 76292=5,820,469,204$
- $4009\times 4009=16072081$
- $1348\times 1348=18,817,104$
- $14007\times 14007=196196049$
- $999\times 999=998001$

3. A factory had packed 2486 buttons in 2486 containers. How many buttons were there altogether?

- Total number of buttons = $2486\times 2486=6,180,196$

4. A square piece of land is 754m long. What is its area in square metres?

- Area of square = $754\times 754 =568,516\text{m}^2$

5. In a coffee plantation, there were 7896 rows of coffee trees. If each row had 7896 trees, how many trees were there altogether?

- Total number of trees = $7896\times 7896=62,346,816$

Practice Exercise 42

1. What is the square of the following?

- $\frac{9}{100}$ or 0.09
- $\frac{441}{529}$
- $3\frac{37}{121}$
- $\frac{3136}{3481}$
- $\frac{4096}{7569}$

2. Find the value of:

- 5.0625 or $5\frac{1}{16}$
- $44\frac{4}{9}$
- $23\frac{13}{36}$
- $\frac{100}{529}$
- $266\frac{7}{9}$

3. Area of square = 150.0625cm^2 or $150\frac{1}{16}$

4. Area of square = 264.0625m^2 or $264\frac{1}{16}$
5. Area of square = 10.5625m^2 or $10\frac{9}{16}$
6. $18\frac{1}{16} - 7\frac{1}{9} = 10\frac{137}{144}$

Practice Exercise 43

1. **What is the square of?**
 - (i) $0.36 \times 0.36 = 0.1296$
 - (ii) $1.12 \times 1.12 = 1.2544$
 - (iii) $4.8 \times 4.8 = 23.04$
 - (iv) $2.24 \times 2.24 = 5.0176$
 - (v) $12.1 \times 12.1 = 146.41$
2. **What is the value of?**
 - (i) $8.4 \times 8.4 = 70.56$
 - (ii) $2.842 \times 2.842 = 8.077$
 - (iii) $42.36 \times 42.36 = 1794.3696$
 - (iv) $17.8 \times 17.8 = 316.84$
 - (v) $34.26 \times 34.26 = 1173.7476$
3. **Grade 7 learners multiplied 117.80 by 117.80. What did they get?**
 - $117.80 \times 117.80 = 13876.84$
4. **What is the area of a square cardboard of sides 36.25 cm?**
 - Area = $36.25 \times 36.25 = 1314.0625\text{cm}^2$
5. **A Grade 7 learner used a calculator to work out the square of 36.0824. What did he get?**
 - $36.0824 \times 36.0824 = 1301.94$

Practice Exercise 44

1. **Find the square root of the following:**
 - (i) =11
 - (ii) =23
 - (iii) =39
 - (iv) =92
 - (v) =34
2. **What is the value of the following?**
 - (i) =28
 - (ii) =49
 - (iii) =81
 - (iv) =47
3. **The area of a piece of land is 42849 m². What is the length of each side?**
 - Length of each side =207m

4. **When learners were playing digital games involving square roots of numbers, they worked out the square root of 11236. What did they get?**

= 106
5. **Grade 7 of Muguga Green Junior Secondary School made a contribution towards the end-of-year party. Each learner contributed as many shillings as the number of learners in their class. If the total contribution was 5625 shillings, how many learners are in Grade 7?**

=75
6. **Mohammed has a rectangular plot measuring 27m by 12m. Mueni has a square plot whose area is the same as that of Mohammed's. What is the length of each side of Mueni's plot?**
 - Length of each side =18m

Practice Exercise 45

1. **What is the square root of:**
 - (i) $\frac{9}{16}$
 - (ii) $\frac{5}{3}$
 - (iii) $\frac{21}{5}$ or $4\frac{1}{5}$
 - (iv) $\frac{26}{29}$
 - (v) $\frac{29}{6}$ or $4\frac{5}{6}$
2. **Evaluate:**
 - (i) $\frac{14}{23}$
 - (ii) $2\frac{3}{4}$ or $1\frac{1}{4}$
 - (iii) 3.435
 - (iv) $\frac{19}{9}$ or $2\frac{1}{9}$
 - (v) $\frac{35}{37}$
3. 9.220
4. $15\frac{2}{3}$
5. = $4\frac{2}{3}$

Practice Exercise 46

1. **Work out the square root of the following:**
 - (i) 0.7
 - (ii) 0.013

(iii) 0.53

(iv) 4.4

2. **What is the value of the following?**

(i) 0.13

(ii) 0.021

(iii) 0.61

(iv) 0.58

(v) 4.4

3. **The area of a square piece of land is 62.41m^2 . What is the length of each side?**

7.9m

4. **The area of a piece of paper is 0.002304m^2 . What is the length of each side?**

0.048m or 4.8 cm

5. **A nursery bed is in the shape of a square. The area of the nursery bed is 16.81m^2 . Calculate the length of one side of the nursery bed.**

4.1m

Practice Exercise 47

1. **Total number of teachers and staff:**

$b+c+f$

2. **Total number of items in the class:**

$w+m+2$

3. **Total items in Oscar's bag:**

$d+f+n$

4. **Total number of rooms in the school:**

$g+h+3$

5. **Total number of fruit plants in the orchard:**

$c+d+r$

6. **Total number of beads in the container:**

$d+f+126$

7. **Total schools participating in the ball games:**

$2+x+y$

8. **Total age of the son and father:**

$x+w$

9. **Total marks in the three learning areas:**

$p+w+k$

10. **Money Omollo had after saving:**

$p-z$

Practice Exercise 48

1. **Total money Becky had at the end:**

$p+k+50$

2. **Total number of animals on the farm:**

$6m+6$

3. **Total number of lorries they had:**

$2k+p-2$

4. **Perimeter of the rectangle:**

$6y+18\text{cm}$

5. **Total learners in the class:**

$2b+3$

6. **Total number of cows:**

$9k+18$

7. **Perimeter of the triangular table top:**

$x+y+pcm$

8. **Total litres of milk collected by Davis in a week:**

$3x+5y\text{litres}$

9. **Distance Belinda covered around the shamba:**

$12z\text{metres}$

10. **Number of items left out in the science congress:**

$e-f$

Practice Exercise 49

Simplify:

1. (i) $7p+5q$

(ii) $10p$

(iii) $4b$

(v) $\frac{17}{4}p$

2. **Simplify**

(i) $\frac{3r+2d}{3r+3d}$

(ii) $\frac{7a+4b}{6a+9b}$

(iii) 2

(iv) $\frac{4w+3x}{2w+3x}$

(vi) $\frac{6q+5r}{q+3r}$

3. $= \frac{5x}{3y}$

4. Total items brought by students:

$5x+1$

5. Solve $4(a+3)-2(a-1)$

$2a+14$

6. Solve $6x+6x+8-15$ $12x-7$

Practice Exercise 50

1. $x+14=48$

2. $28+y=52$

3. $z-13=27$

4. $180=k+140$

5. $p+4p=25$

6. $16x=64$

7. $\frac{z+6}{4} = 18$

8. Answer = C

9. $2z + 5 = 35$

10. $2(2w+20)=180$

11. $10x+20(2x)=300$

12. $2g+9=35$

13. $f+20=60$

14. $50+70+x=180$

Practice Exercise 51

1. Solve the following equations:

(i) $y=5$

(ii) $p=18$

2. Solve the following equations:

(i) $c=49$

(ii) $d=15$

3. Solve the following equations:

(i) $t=5$

(ii) $k=3$

4. Solve the following equation:

$M=44$

5. Solve the following equations:

(i) $q=64$

(ii) $e=2.5$

6. Solve the equation:

$p=3$

7. Find the largest angle in a triangle:

$= 110^\circ$.

8. The price of a mango is p shillings. A

Grade 7 learner had 50 shillings, he bought two mangoes, and in his pocket, he remained with 20 shillings. Find the price of the mango.

$= 15$ shillings.

9. $\frac{1}{4}p$

10. 27

Practice Exercise 52

1. Simplify the following equations:

(i) $y=1$.

(ii) $w=1$.

2. $5(3y+4)=3(2y-2)$

$y=-2\frac{8}{9}$.

3. $9(2m-2)+(m-3)=3(2m+4)$

$m=\frac{33}{13}$.

4. Simplify the following equations:

(i) $a=20$.

(ii) $q=-\frac{3}{2}$.

5. Solve the following equations:

(i) $p=\frac{1}{2}$

(ii) $y=\frac{1}{2}$

6. $p=27$.

Practice Exercise 53

1. Solve the following equations:

(i) $f=72$

(ii) $d=8$

2. Solve the following equations:

(i) $g=84$

(ii) $a=72$

3. $t=4$

4. $r=4$

5. $m=5$

6. $P=8$

7. $n=14$

8. (a) $w=5$

(b) $d=0$

(c) $n = 10$

(d) $s = \frac{42}{5}$

(e) $x = 6$

Practice Exercise 54

- A Grade 7 learner made a wrist bangle using 64 beads:**
 - Yellow beads: 15
 - Blue beads: 31
- In a national park, tourists saw t lions, 12 elephants, and 6 more buffaloes than lions:**
 - Lions: 6
 - Buffaloes: 12
- In a cupboard there were t exercise books, half as many textbooks as exercise books, and 32 rubbers:**
 - (i) = 68
 - (ii) = 34
- Mangoes in the bag:**
Answer: 24 mangoes.
- Sum of ages in 10 years:**
Answer: 57.5 years.
- Trader's earnings from selling eggs:**
 $b(3n-1)$
- Measurement of the length of the field:**
= 16 metres
- Sh. 19530 for rent**
- =14**

Practice Exercise 55

- (i) $X < 10$
- (ii) $W > 6 + 7$
- (iii) $17 > 2k$
- (iv) $M < 12$
- (v) $3t - 6 \geq 18$
- (vi) $42 \leq 5m + 2$

Validate the statements below using the suitable inequality symbol:

- (i) Less than

(ii) Greater than

(iii) Less than

(iv) Less than

(v) Less than

(vi) Greater than

- Identify the appropriate inequality sign that can be used to make the statement below correct:**
Greater than

Practice Exercise 56

Question 1

Kyalo has more than 64 turkeys, and the number of turkeys is given by $4k - 44k - 4$.

Inequality:

$$4k - 4 > 64$$

Question 2

The number of chairs in the church is $6p + 86p + 86p + 8$, and it is less than 60.

Inequality:

$$6p + 8 < 60$$

Question 3

The sum of 11 and another number t is less than or equal to 32.

Inequality:

$$11 + t \leq 32$$

Question 4

If y is added to 16, the result is greater than or equal to 42.

Inequality:

$$16 + y \geq 42$$

Question 5

The distance from Tanu's home to school is $2x - 32x - 32x - 3$, and it is further than Maria's home, which is 3 km from school.

Inequality:

$$2x - 3 > 3$$

Question 6

The difference between y and 16 is greater than or equal to 23.

Inequality:

$$y - 16 \geq 23$$

Question 7

The number of marbles in a carton is more than 20, and there are between 21 and 96 marbles.

Equation representing the range:

$$21 \leq \text{marbles} \leq 96$$

Inequality for more than 20 marbles:

$$\text{marbles} > 20$$

Question 8

The total number of books in a student's bag is less than 15, where q represents textbooks and p represents exercise books.

Inequality:

$$q + p < 15$$

Question 9

Buying a phone p and a laptop l costs more than 50,000 shillings.

Inequality:

$$p + l > 50,000$$

Question 10

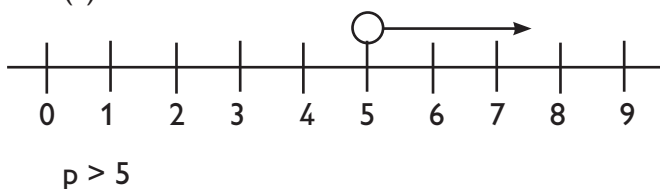
A mother stocks her kitchen with plates p and cups c . The total number of utensils is less than 15.

Inequality:

$$p + c < 15$$

Practice Exercise 57

Learner's to represent the inequalities on number lines in this exercise. The first three have been done for you.

(i)**(ii)****(iii)**

$$w \leq 11$$

Practice Exercise 58**1. Compound Inequalities**

(i) $1 < K < 6$

(ii) $17 < N < 22$

(iii) $12 < P < 18$

2. Factory Workers

Let S represent the number of skilled workers. The compound inequality is:
 $85 < S < 120$

3. Simple Inequality

For P being greater than 21 and less than 30:
 $21 < P < 30$

4. Party Attendance

Let M represent the number of men. The inequality is:
 $36 < M < 54$

5. Vehicles in the Yard

Let T represent the number of matatus. The inequality is:
 $54 < T < 96$

6. Sitting Attendance

Let W represent the number of women. The inequality is:
 $5 < W < 15$

7. Cars Passing by the School

Let B represent the number of black cars. The inequality is:
 $12 < B < 50$

8. University Students

Let H represent the number of students who majored in humanities. The inequality is:
 $3 < H < 10$

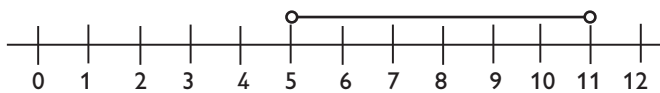
9. General Inequality

If x is more than 2 and less than 10:
 $2 < x < 10$

Practice Exercise 59

Learners to represent the compound inequalities given on this exercise on a number line, the first three have been done for you.

1. i)



$$5 < z < 11$$

ii)



$$7 > c > 2$$

iii)



$$10 < v < 13$$

Practice Exercise 60

1. CB
2. HF
3. C

Practice Exercise 61

1. (i) $\sqrt{2^2 + 1.5^2} = 2.5$
(ii) $\sqrt{5^2 + 12^2} = 13$
(iii) $\sqrt{8^2 + 15^2} = 17$
(iv) $\sqrt{7^2 + 24^2} = 25$

2. A

Practice Exercise 62

1. (i) $c = 4\text{cm}$
(ii) $k = 8\text{cm}$
(iii) $p = 17\text{cm}$
(iv) $q = 9\text{cm}$
2. $y = 61\text{cm}$
3. **Length of the ladder:**
26 meters.
4. **Tailor's triangular cloth design:**
25 cm.
5. **Height of the fence:**
7 meters.
6. **Distance swum by Oteyo:**
25 meters.
7. **Diagonal of a rectangular shape:**
13 meters.
8. **Distance of the rope (Flagpole):**
25 meters.
9. **Length of the cable:**
50 meters.
10. **Distance from the starting point (hiking):**
the student is **10 kilometers** away from the starting point.

Practice Exercise 63

1. **Convert to Centimetres (cm):**
(i) $2.46\text{m} = 2.46 \times 100 = \mathbf{246\text{ cm}}$
(ii) $36\text{dm} = 36 \times 10 = \mathbf{360\text{ cm}}$
(iii) $0.48\text{Dm} = 0.48 \times 1000 = \mathbf{480\text{ cm}}$
(iv) $2\text{Hm} = 2 \times 10,000 = \mathbf{20,000\text{ cm}}$
2. **Convert to Metres (m):**
(i) $4060\text{cm} = 4060 \div 100 = \mathbf{40.60\text{ m}}$
(ii) $152\text{dm} = 152 \div 10 = \mathbf{15.2\text{ m}}$
(iii) $4.360\text{Dm} = 4.360 \times 10 = \mathbf{43.60\text{ m}}$
(iv) $12\text{Hm} = 12 \times 100 = \mathbf{1200\text{ m}}$
3. **Convert to Decametres (Dm):**
(i) $125\text{m} = 125 \div 10 = \mathbf{12.5\text{ Dm}}$
(ii) $42000\text{cm} = 42000 \div 1000 = \mathbf{42\text{ Dm}}$
(iii) $726\text{dm} = 726 \div 100 = \mathbf{7.26\text{ Dm}}$
(iv) $3.2\text{Hm} = 3.2 \times 10 = \mathbf{32\text{ Dm}}$

4. **Convert to Hectometres (Hm):**
 (i) $436\text{Dm} = 436 \div 10 = 43.6 \text{ Hm}$
 (ii) $640\text{m} = 640 \div 100 = 6.4 \text{ Hm}$
 (iii) $12.364\text{cm} = 12.364 \div 10000 =$
0.0012364 Hm
 (iv) $4102\text{dm} = 4102 \div 1000 = 4.102 \text{ Hm}$

5. **Convert 8.64Dm into Decimetres:
864 decimetres**

Practice Exercise 64

- (i) 14 Hm 1 Dm
(ii) 11 Dm 39 dm
(iii) 23 m 24 cm
(iv) 1 Hm 64 m
- 4Hm 220dm
- Total Length of Two Pipes
21m 18cm
- Total Distance Covered by Zipporah and Stacy
: 46hm 55m
- Total Height of the Twins
: 3.00m
- Total Distance Between the Two Points
: 2Km 3Hm 95m
- Total Distance Covered by the Student
: 186 Dm 50dm
- Total Length of Two Sticks
: 9m 1dm 3m
- Remaining Material After Cutting
: 796.2m
- Length of Wire Mesh Needed
: 199.8m

Practice Exercise 65

- i) 428 m 88cm
(ii) 24240m or 242Hm 40m
(iii) 41.28m or 412dm 8cm

- Division of Lengths
(i) 158m
(ii) 750m
(iii) 65cm
- 10812m or 1081Dm 200cm
- Total Distance Covered by Natasha
404.5m or 400m 5dm
- Length of Each Part of String
2.58m or 2m 58cm
- Total Distance Covered by Moris in 3 Days
907.62m or 907m 62cm
- Share of Land per Son
2334.45m
- Length Covered by 9 Rolls of Barbed Wire
 $60\frac{6}{7}\text{m}$
- Length of Each Piece of Wood
Length of each piece: 2Hm 12m
- Length of Spacing between the holes
223.125m.

Practice Exercise 66

- (i) 86cm
(ii) 28cm
(iii) 72cm
(iv) 80cm
(v) 60cm
- 62cm
- Distance Covered by the Athlete
14.4 Hm
- Total Length of Wire Used for the Square Piece of Land
945m
- Total Distance of the Square Mat
216dm
- Distance in metres
6000 metres
- Distance in dm
16000 decimetres

8. The perimeter of each tile is 400 cm.
9. Perimeter in cm
42700cm
10. The distance around the piece of land is 7.2 decimeters.

Practice Exercise 67

1. (a) 44cm
(b) 22cm
(c) 88cm
2. (a) 22cm
(b) 44cm
(c) 132cm
3. Circumference of the Fish Pond
175.84m
4. Circumference of the Bicycle Wheel
(i) Circumference of the wheel: 314 cm
(ii) Number of revolutions: 20
5. Length of the Electric Cables
1054.08m
6. Circumference of the Circle on the Volleyball Pitch
31.4m
7. Diameter of the Circle Given Circumference
126 cm
8. Distance Across the Circle (Diameter)
35 cm
9. Radius of the Bicycle Wheel
25 cm
10. Radius of the Lid
3.02 cm

Practice Exercise 68

1. Convert the following into ares:
To convert square meters (m^2) to ares, divide by 100 (since 1 are = 100 m^2).
(i) 36 ares
(ii) 1.96 ares

- (iii) 1.19 ares
- (iv) 1680 ares
- (v) 1.8 ares

2. Convert the following into hectares:
To convert square meters (m^2) to hectares, divide by 10,000 (since 1 hectare = 10,000 m^2).
(i) 1.72 hectares
(ii) 640 hectares
(iii) 49 ha
(iv) 8.1 ha
(v) 16.8 ha
3. Convert the following into ares:
To convert hectares (ha) to ares, multiply by 100 (since 1 hectare = 100 ares).
(i) 1600 ares
(ii) 25 ares
(iii) 144 ares
(iv) 900 ares
(v) 1275 ares
4. Convert the following into square meters:
To convert ares to square meters, multiply by 100 (since 1 are = 100 m^2).
(i) 64 m^2
(ii) 1400 m^2
(iii) 36 m^2
(iv) 630 m^2
(v) 10 m^2
5. Convert the following into square meters:
To convert hectares to square meters, multiply by 10,000 (since 1 hectare = 10,000 m^2).
(i) 120 m^2
(ii) 36 m^2
(iii) 34000 m^2
(iv) 256000 m^2
(v) 11000 m^2

6. **Area of a Piece of Land in Square Metres**
D. 24000

Practice Exercise 69

- (i) 60cm^2
(ii) 160cm^2
(iii) 252cm^2
(iv) 644cm^2
- Area of a Rectangular Playground**
 7700 m^2 .
- Number of Tiles Needed to Cover a Hall Floor**
3500 tiles.
- Area of a Rectangular Tabletop**
 $19,580\text{ cm}^2$
- Area of a Flower Garden**
 216 m^2
- Area of rectangle**
90 ares
- Area of a Rectangular Maize Farm in Hectares**
0.0108 hectares.
- Area of a Rectangular Piece of Land**
 340 m^2 .
- Length of the School Farm**
400 meters.

Practice Exercise 70

- (a) 108cm^2
(b) 360cm^2
- Area of a Parallelogram in Hectares**
0.054 hectares.
- Area of a Parallelogram in Hectares**
0.96 hectares.

- Finding the Height of a Parallelogram**
6 cm.
- Finding the Base Length of a Parallelogram**
56 cm.
- Area of a Parallelogram**
 516cm^2
- Area of a Parallelogram in Hectares**
4.56 hectares.
- Length of the Roof of the House**
30 meters.
- Area of the Tabletop in Square Metres**
3.12 square meters.
- Length of the Perpendicular Height**
28 cm.

Practice Exercise 71

- Area of the rhombus**
 96cm^2
- Area of a Rhombus in Ares**
6 ares.
- Area of the Rhombus Cutout**
 1640 cm^2
- Area of a Rhombus Using Diagonals**
 240 cm^2
- Area of the Rhombus Using Sides and Diagonal**
 51cm^2
- Solving for x in a Rhombus with Given Diagonals and Area**
30 meters.
- Area of the Rhombus-Shaped Garden**
 864m^2
- Area of the Rhombus-Shaped Farm**
 240m^2

9. $b = 7$
10. The area of the rhombus is 0.0216 m^2 .

Practice Exercise 72

1. (a) 288cm^2
(b) 210cm^2
2. 30m^2
3. $h = 10\text{cm}$
4. Area of the Trapezium Shaped Land
 0.4 hectares.
5. $BC = 36\text{cm}$
6. Height of the Trapezium
 12 meters.
7. $CD = 17\text{cm}$
8. 736cm^2
9. Area of the Trapezium Shaped Carton
Box
 725 m^2
10. Area of the Trapezium Shaped Cow
Shed Model
 740 cm^2

Practice Exercise 73

1. (a) 616 cm^2
(b) 1386cm^2
2. Area of the Circular Fishpond
(Radius = 42m)
 0.5528 hectares.
3. 77cm^2
4. Radius of the Circular Roundabout
(Area = 154 m^2)
 7 meters.
5. Area of the Semicircle (Radius = 14cm)
 307.72 cm^2
6. Area of the Circular Playground
(Diameter = 98m)
 7543.14 m^2
7. Area the Cow Can Graze (Rope Length
= 10m)
 314 m^2
8. Area of the Swimming Pool (Diameter
= 7m)
 38.465 m^2
9. Distance from One End to the Other
(Area = 616 m^2)
 28 meters.

10. Area of the Semicircular Basketball
Court (Radius = 2m)
 6.28 m^2

Practice Exercise 74

1. (i) 168cm^2
(ii) 216cm^2
2. 700cm^2
3. 168cm^2
4. Area of a Combined Shape (Rectangle,
Quarter Circle, and Semicircle)
 853.82 cm^2
5. 322cm^2
6. Area of the Pathway Around a
Rectangular Garden
 54 m^2
7. Area of the Walkway Around a
Circular Pond
 75.36 m^2
8. Area of the Circular Ring (Outer
Radius = 8m , Inner Radius = 5m)
 122.46 m^2
9. Area of the Space Left in a Photo
Frame
 125 cm^2
10. Area of the Space Not Covered by
Carpet in the Auditorium
 36 m^2 .

Practice Exercise 75

1. (a) Volume of Cubes

Side (m)	Side (m)	Side (m)	Volume (m^3)
2	2	2	8
6	6	6	216
10	10	10	1000
15	15	15	3375

(b) Volume of Rectangular Prisms

Length (m)	Width (m)	Height (m)	Volume (m ³)
4	3	2	24
7.2	6	4	172.8
10	8	3	240
12.5	8	4.5	450

2. **Volume of the Cubical Water Tank**
3375 cubic metres.

3. **Volume of the Pit Latrine**
450 cubic metres.

4. **Volume of Materials for the Road**
18,000 cubic metres.

5. **Volume of the rectangular container**
147 cubic metres.

Practice Exercise 76

1.

Volume (m ³)	Volume (cm ³)
216	216000000
1.8	1800000
20.008786	20008786
0.024	24000
78.46	78460000
3.6	3600000

2. **Convert Cubic Meters to Cubic Centimeters**
64,000,000 cm³

3. **Convert Cubic Centimeters to Cubic Meters**
27 m³

4. **Convert Cubic Meters to Cubic Centimeters**
(i) 2,500,000cm³
(ii) 12,500,000cm³

5. **Convert Cubic Centimeters to Cubic Meters**

(i) 0.0484m³

(ii) 343m³

6. 4.5m³

7. 0.01m³

8. 6,238,000cm³

9. 8,000,000cm³

10. 1,000,000cm³

Practice Exercise 77

1. (a) 4096cm³

(b) 1152cm³

2. **Rectangular Tank**

i) Volume in cubic meters (m³)

288 m³

ii) Volume in cubic centimeters (cm³)

288,000,000 cm³

3. **Cubical Container**

8 cm

4. **Length of the width**

W= 12cm

5. **Cubical Tank**

25 m²

6. **Rectangular Dam**

i) Volume in cubic centimeters (cm³):

6,630,000,000 cm³

ii) Volume in cubic meters (m³):

6630 m³

7. **Gift Box**

1000 cm³

8. **Volume of Classroom**

288 m³

9. **The volume of each block**

0.3 m³

10. **Tank Capacity**

23.8 m³

Practice Exercise 78

1. (i) 2355cm³

(ii) 17248cm³

2. **Cross-Section Area of a Cylinder**

49,896cm³

3. **Water Tank Volume**

98.56 m³

4. **Volume of half cylinder**
2310cm³
5. **Feeding Can Volume**
770,000 cm³ or 769,300cm³
6. **Soda Bottle Volume**
339.12 cm³
7. **Oil Drum Volume**
0.588 m³
8. **Cylindrical Pillar Volume**
1.362 m³
9. **Flower Pot Volume**
7850 cm³
10. **Metal Rod Volume**
1256 cm³

Practice Exercise 78

1. Convert the following into litres:
 - (i) 12000 cm³
12litres
 - (ii) 32400 cm³
32.4litres
 - (iii) 8100000 cm³
8100litres
2. Convert the following into litres:
 - (i) 9 m³
9000litres
 - (ii) 1.5 m³
1500litres
 - (iii) 3224 m³
3,224,000litres
3. **A cylindrical tank has a volume of 3.08 m³. How much water can it hold in litres?**
3080litres
4. **A container is full of water. If it has 336000 litres, what is its volume in:**
 - (i) cm³
336000000cm³
 - (ii) m³
336m³
5. A community tank has a capacity of 7700000 litres. What is its volume in:
 - (i) cm³
7700000000cm³
 - (ii) m³
7700m³

6. **What is 33.6 m³ converted into litres?**
33600litres
7. **The capacity of a rectangular tank is 5000 litres. Convert the volume in cubic meters.**
5m³
8. **Convert 50 litres in number seven above into cubic centimeters.**
50000cm³
9. **A container has a volume of 48000 cm³. Convert the above volume into litres.**
48litres
10. **Convert the volume of the containers in number 9 above from 48000 cm³ into cubic meters.**
0.048m³

Practice Exercise 80

1. **Completing the table:**

Volume (m ³ / cm ³)	Capacity (ml/l)
100cm ³	100ml
3000cm ³	3000ml
81m ³	81000l
24000cm ³	24l
4620000cm ³	4620l
1.6m ³	1600l
336000cm ³	336000ml
12.25m ³	12250l
4.84m ³	4840l

2. **A Grade 7 learner filled a container with a volume of 842,000 cm³ of water. the correct answer is:**
B. 842,000 ml

Practice Exercise 81

- (i) 10000ml
(ii) 3072ml
(iii) 36960ml
(iv) 24,640,000ml
- (i) 0.07776l
(ii) 0.343l
(iii) 24640l
(iv) 2310l
- 3078.76 litres of water.
- 48,000 litres of water to fill the tank.
- (i) Volume in m^3
69.44 m^3
(ii) Volume in cm^3
69440000 cm^3
(iii) Volume in litres
69440l
- Volume of the cylindrical container in milliliters
5,024,000 ml
- Total capacity of the containers in cm^3
40,000 cm^3
- Capacity of the water tank in cm^3
203,500 cm^3
- Capacity of the cylindrical tank in litres
141,300 litres
- Total soda drunk by the class in litres
10.5 litres

Practice Exercise 82

- Convert the following into minutes:
(i) 6 hours = 360 minutes
(ii) 5 $\frac{1}{2}$ hours = 330 minutes
(iii) 3 $\frac{2}{5}$ hours = 204 minutes
(iv) 8 $\frac{1}{3}$ hours = 500 minutes
- Convert the following into seconds:
(i) 36 minutes = 2160 seconds

- (ii) 56 minutes = 3360 seconds
(iii) 45 $\frac{1}{2}$ minutes = 2730 seconds
(iv) 55 minutes = 3300 seconds

- Convert the following into seconds:
(i) 3 hours = 10800 seconds
(ii) 12 $\frac{1}{2}$ hours = 45000 seconds
(iii) 6 hours = 21600 seconds
(iv) 55 minutes = 3300 seconds
- Grade 7 learners took 7200 seconds to do a Mathematics test. How long did the test take in hours?
2 hours
- To prepare a seedbed and to sow small seeds, learners took 85 minutes. What is this time converted into hours?
1 hour and 25 minutes
- Complete the following conversion table:

3 hours	180 minutes
5400 seconds	1.5 hours
7200 seconds	120 minutes
9 $\frac{1}{2}$ hours	570 minutes
4 $\frac{1}{2}$ minutes	270 seconds
3 $\frac{3}{4}$ hours	13500 seconds
25200 seconds	420 minutes
840 minutes	14 hours
- A train's journey took 2 $\frac{1}{2}$ hours. How long did it take in seconds?
9000seconds

Practice Exercise 83

- Convert the following distances in kilometres:
(i) 48000 m = 48 km
(ii) 2346 m = 2.346 km
(iii) 78600 m = 78.6 km
- Convert the following distances in metres:
(i) 2 $\frac{1}{2}$ km = 2500 m
(ii) 47 km = 47000 m
(iii) 36.4 km = 36400 m

3. Total distance = 48 km
4. Distance in metres = 352000 m
5. Distance in kilometres = 14.5 km
6. Distance in metres = 5000 m
7. Weekly distance = 5 km
8. In metres = 190000 m
9. Distance in kilometres = 1.5 km
10. Distance in metres = 3000 m

Practice Exercise 84

1. A Grade 7 learner rode from home to school a distance of 800 m in 40 seconds. What distance did she cover in one second?
20 m/s
2. During a marathon race, Kyalo covered 42 km in 3 hours. What distance did he cover in one hour?
14 km/h
3. A safari rally car covered 600 km from 8:00 am to 12:00 noon. What distance did it cover in one hour?
150 km/h
4. An athlete started a 1200 m race at 4:20 pm and finished at 4:22 pm. What distance did he cover in one second?
10 m/s
5. Chacha covered a distance of 4 metres in one second. What distance did he cover in 3 minutes?
720 m
6. A motorist covered a distance of 80 km in one hour. How long did he take to cover a distance of 320 km?
4 hours
7. A motorist covered a distance of 240 km. If he covered 60 km in every hour, what time did he reach his destination if he started the journey at 9:45 am?
1:45pm
8. In every second, Njoroge covered a distance of 6 metres. How long did he take to cover a distance of 12 kilometres?
2000 seconds or $\frac{5}{3}$ hours
9. A safari rally car covered a distance of 200 km in every hour. How long did it

take to cover a distance of 960 km? 4.8 hours, or 4 hours 48 minutes.

10. In a competition, Grace covered a distance of 400 m in 80 seconds. What speed in m/s was she running with?
5 m/s

Practice Exercise 85

1. Calculate the speed to complete the table below.
 - (i) Distance = 48 km, Time = 3 hrs
Speed = 16 km/hr
 - (ii) Distance = 360 km, Time = 4 hrs
Speed = 90 km/hr
 - (iii) Distance = 540 km, Time = 9 hrs
Speed = 60 km/hr
 - (iv) Distance = 343 km, Time = 7 hrs
Speed = 49 km/hr
 - (v) Distance = 132 km, Time = 2 hrs
Speed = 66 km/hr
2. Maina cycled from Nyakoe to Kaperuk a distance of 56 km in 4 hours. At what speed was he cycling?
Speed = 14 km/hr
3. A motorboat covered a distance of 515 km in 5 hours. What was its speed?
Speed = 103 km/hr
4. The distance between two airports is 7200 km. At what speed does a jet need to fly to cover the distance in 4 hrs?
Speed = 1800 km/hr
5. Nekesa started his 336 km journey at 07:00h. If he completed his journey at 14:00h, what was his speed?
48 km/hr
6. A motorist left home at 7:30 am for town, a distance of 270 km. If he arrived at 10:30 am, what was his speed?
90 km/hr
7. A car travels a distance of 150 km in 3 hrs. What is the speed of the car in km/hr?
50 km/hr

8. **A train travels 300 km in 5 hrs. What is the speed of the train in km/hr?**
60 km/hr
9. **During a road trip, a family drives for 450 km in 6 hrs. What is their speed in km/hr?**
75 km/hr
10. **A boat travels 60 km upstream in 2 hrs and 1.5 hrs downstream. What is the average speed for the boat?**
 $34 \frac{2}{7}$ km/hr

Practice Exercise 86

1. **A sparrow flew a distance of 24 km in 4 minutes. What was its speed in m/s?**
100m/s
2. **A safari rally car covered a distance of 480,000 m in 40 minutes. What was its speed in m/s?**
200m/s
3. **A fighter jet covered a distance of 3360 km in 70 minutes. What was its speed in m/s?**
800m/s
4. **What is the speed in m/s of a cheetah that covered a distance of 8000 m in 160 seconds?**
50m/s
5. **A cyclist rode at a speed of 10 m/s. What time did he take to cover a distance of 55 meters?**
5.5seconds
6. **A drone flew for 1 minute and covered a distance of 4.32 km. What was its speed in m/s?**
72m/s
7. **A sprinter runs 200 m in 25 seconds. What is the sprinter's speed in m/s?**
8m/s
8. **A swimmer covers a distance of 50 m in 40 seconds. What is the swimmer's speed in meters per second?**
1.25m/s
9. **During a walking race, Neema walked 300 m in 60 seconds. What speed did she walk with?**
5m/s

10. **An object was thrown up and it came down in 4 seconds after reaching its top height. If the top height was 100 m, what speed did it fall with?**
25 m/s

Practice Exercise 87

1. **Convert the following into m/s:**
To convert from km/h to m/s, divide the speed by 3.6 (since 1 km/h = 1000 meters / 3600 seconds).
- (i) 18 km/h = 5 m/s
 - (ii) 72 km/h = 20 m/s
 - (iii) 54 km/h = 15 m/s
 - (iv) 30 km/h = 8.33 m/s
2. **A rally car travelled at a speed of 180 km/h. What was its speed in m/s?**
• 50 m/s
3. **Aminata travelled from home to town a distance of 324 km from 7:28 am to 10:28 am:**
(i) 108 km/h
(ii) 30 m/s
4. **The air distance from Nairobi to Lusaka is 1470 km. An aeroplane took 7 hours to fly:**
(i) 210 km/h
(ii) 58.33 m/s
5. **During their tour, Grade 6 learners from Kaharo Primary left their school at 6:00 am and arrived at Nakuru National Park at 9:00 am. They covered a distance of 270 km:**
(i) 90 km/h
(ii) 25 m/s
6. **Convert 108 km/h into m/s:**
• 30 m/s
7. **Convert the following into km/h:**
To convert from m/s to km/h, multiply by 3.6.
(i) 50 m/s = 180 km/h
(ii) 30 m/s = 108 km/h

(iii) $15 \text{ m/s} = 54 \text{ km/h}$

(iv) $5 \text{ m/s} = 18 \text{ km/h}$

8. **A train crossed a bridge at a speed of 20 m/s. What was its speed in km/h?**
 $20 \text{ m/s} = 72 \text{ km/h}$
9. **An athlete ran at a speed of 10 m/s in a rally race. What was his speed in km/h?**
 $10 \text{ m/s} = 36 \text{ km/h}$
10. **A motorbike rider rode at a speed of 108 km/h. What was his speed in m/s?**
 $108 \text{ km/h} = 30 \text{ m/s}$
11. **A horse ran at a speed of 15 m/s. What was its speed in km/h?**
 $15 \text{ m/s} = 54 \text{ km/h}$
12. **Convert 50 m/s into km/h:**
 $50 \text{ m/s} = 180 \text{ km/h}$

Practice Exercise 88

1. (i) 15°C
(ii) 36°C
(iii) 8°C
(iv) 76°C
(v) 99°C
2. (i) 283K
(ii) 263K
(iii) 333K
(iv) 193K
(v) 303K
3. (a) $860^\circ\text{C} =$ **Eight hundred and sixty degrees Celsius**
(b) $71.30^\circ\text{C} =$ **Seventy-one point three degrees Celsius**
(c) $490^\circ\text{C} =$ **Four hundred and ninety degrees Celsius**
(d) $640^\circ\text{C} =$ **Six hundred and forty degrees Celsius**
(e) $150^\circ\text{C} =$ **One hundred and fifty degrees Celsius**
4. (a) $293\text{K} =$ **Two hundred and ninety-three Kelvin**
(b) $173\text{K} =$ **One hundred and seventy-three Kelvin**
(c) $243\text{K} =$ **Two hundred and forty-three Kelvin**
(d) $363\text{K} =$ **Three hundred and sixty-three Kelvin**

(e) $232\text{K} =$ **Two hundred and thirty-two Kelvin**

5. The temperature of the metal was six degrees Celsius = 6°C
6. The temperature of the water boiled at $373\text{K} = 373\text{K}$
7. The temperature of the substance was eighty-nine degrees Celsius = 89°C

Practice Exercise 89

1. (i) $23^\circ\text{C} = 296\text{K}$
(ii) $42^\circ\text{C} = 315\text{K}$
(iii) $74^\circ\text{C} = 347\text{K}$
(iv) $93^\circ\text{C} = 366\text{K}$
(v) $68^\circ\text{C} = 341\text{K}$
(vi) $25^\circ\text{C} = 298\text{K}$
2. 373K
3. **Patience heated milk to a temperature of 76°C . What was its temperature in Kelvin?**
 349K
4. **Benson took his body temperature and noted that it was 36.7°C . What was his body temperature in Kelvin?**
 309.7K
5. **Temperatures of Grade 7 learners in Kahash Junior Secondary School:**
(a) Temperature at Kahash:
 296.8K
(b) Temperature at the foot of Mt Kenya:
 290.6K
(c) Temperature halfway up the mountain:
 281.4K
(d) Temperature at the top of the mountain (estimated to be 3°C below 0°C):
 270K
6. **Grade 7 learners heated water until it was 90°C . What was its temperature in Kelvin?**
 363K
7. **The temperature in a Grade 7 class is 25°C . Convert this temperature to Kelvin.**
 298K

8. The freezing point of water is 0°C . Convert this temperature to Kelvin.
273K
9. The average body temperature of humans is 37°C . What is the body temperature in Kelvin?
310K
10. It is estimated that the surface temperature of the sun is 5500°C . What is the temperature of the sun in Kelvin?
5773K

Practice Exercise 90

1. (i) $363\text{K} = 363 - 273 = 90^{\circ}\text{C}$
(ii) $273\text{K} = 273 - 273 = 0^{\circ}\text{C}$
(iii) $264\text{K} = 264 - 273 = -9^{\circ}\text{C}$
(iv) $318\text{K} = 318 - 273 = 45^{\circ}\text{C}$
(v) $283\text{K} = 283 - 273 = 10^{\circ}\text{C}$
2. The temperature of ice was 233K. What was this temperature in $^{\circ}\text{C}$?
 -40°C
3. During their tour in Mombasa, Grade 7 learners heated water until it was 373K. What was this temperature in $^{\circ}\text{C}$?
 100°C
4. Complete the table by filling in the spaces:

Degrees Celsius ($^{\circ}\text{C}$)	Kelvin (K)
80°C	353K
30°C	303 K
28°C	301K
48°C	321 K
63°C	336K
-10°C	263 K
-70°C	203K

5. The temperature of a substance was 263K. What was its temperature in degrees Celsius? -10°C

6. A science experiment in the lab was conducted at 77K. What is the temperature in degrees Celsius?
 -196°C
7. The boiling point of water is said to be 373K. Convert this temperature into degrees Celsius.
 100°C
8. Ice cream is best stored at 255K. What is this temperature in degrees Celsius?
 -18°C
9. On a cold winter day, the lowest temperature recorded was 260K. Convert this temperature into degrees Celsius.
 -13°C
10. On a hot summer day the highest temperature recorded was 350K. Convert this temperature into degrees Celsius.
 77°C

Practice Exercise 91

1. (i) After 10 minutes:
 82°C
(ii) After 15 minutes:
 72°C
(iii) After 30 minutes:
 46°C
2. (i) Which town recorded the highest temperature?
Thika with 303K
(ii) What was the temperature of Thika town in degree Celsius?
 30°C
(iii) Which town recorded the lowest temperature?
Mombasa with 283K.
(iv) By how many Kelvin was Mombasa hotter than Murang'a?
15K
(v) By how many Kelvin was the mean temperature of Kericho below the boiling point?
The mean temperature of Kericho was 76K below the boiling point.

3. The temperature of a frozen mass of ice was 200°C below freezing point. What was its temperature in Kelvin?
253K
4. Water at a temperature of 273K was heated until it boiled. What is the rise in temperature?
The rise in temperature is 100K.
5. Grade 7 learners heated water that was at 120°C above freezing point. What was its temperature in Kelvin?
393 K
6. Liquid x in the laboratory gained heat at a rate of 20°C per minute. After being heated for 5 minutes, its temperature rose to 76°C . What was its temperature before heating in Kelvin?
249 k
7. A patient's temperature rose from 308K to 311K. What was the rise in temperature in Kelvin?
The rise in temperature is 3K.
8. A metal was heated to 69°C . It was allowed to cool to a temperature of 24.5°C . Calculate the drop in temperature.
 44.5°C
9. The weather forecast in the morning recorded a temperature of 18.9°C . The temperature rose by 12.5°C . What was the temperature in the afternoon?
 $18.9^{\circ}\text{C} + 12.5^{\circ}\text{C} = 31.4^{\circ}\text{C}$
10. A car engine heated to 423K. The driver allowed the engine to cool to 60°C . What was the drop in temperature?
 90°C

Practice Exercise 92

1. John's profit from selling eggs:
Ksh 600
2. Michelin's loss from selling tomatoes:
Ksh 200
3. Banice's profit from selling a second-hand car:
Ksh 0.5 million (or Ksh 500,000)
4. Fruit vendor's loss:

- Ksh 60 per pile
5. Wanjiru's profit from selling TV sets:
Ksh 50,000
6. Trader's loss on pawpaws:
Ksh 15
7. Bianka's profit from selling goats:
Ksh 5,600
8. Businessman's loss on the computer:
Ksh 5,000
9. Gateman's profit from selling concert tickets:
Ksh 5,000
10. Possible buying price of the item:
Ksh 1,200

Practice Exercise 93

1. Calculate the percentage profit:
 - (i) 37.5%
 - (ii) 40%
 - (iii) 25%
 - (vi) 25%
2. Calculate the percentage loss:
 - (i) 10%
 - (ii) 12.5%
 - (iii) 16.67%
 - (iv) 12.5%
3. A trader bought a tractor for Ksh 4,500,000 and sold it for Ksh 5,400,000. What percentage profit did he make?
20%
4. Lasoi bought 25 pawpaws each at Ksh 40. She spent Ksh 200 on transport. During transportation, five pawpaws got spoilt. She sold the rest at Ksh 50 each. What was her percentage profit?
16.67%
5. A trader made a loss of 10% after selling a mobile phone for Ksh 5400. How much was the buying price?
Ksh. 6000
6. Bruno sold a TV set for Ksh 12,000, making a profit of Ksh 4000. What was the percentage profit?
50%

7. Lemuel bought 8 dairy goats at Ksh 10,000 each. He later sold all the goats at Ksh 15,000 each. Calculate the percentage profit.
50%
8. Prudence sold her study table, making a loss of 7.5%. If she sold the study table for Ksh 7215, what was the marked price?
Ksh.7800
9. Grade 7 learners had an agricultural project that involved rearing rabbits. They bought the rabbits and sold them after 6 months. If a profit of 15% was made, what was the buying price if the selling price was Ksh 17,250?
Ksh15,000
10. Jalango bought a brand new car for Ksh 1.2 million. He used it and sold it after one year for Ksh 0.8 million. Calculate the percentage loss.
33.33%

Practice Exercise 94

1. Fill in the missing amount in the table below:

Marked Price (M.P)	Selling Price (S.P)	Discount (D)
1120	1100	20
96000	84000	12000
2400000	2200000	200000
268780	234640	34140
9600000	9100000	500000

2. The marked price of a television was sh. 78000. Patience bought it after she was allowed a discount of $\frac{1}{6}$ of the marked price. How much did she pay?
= Ksh 65,000.
3. Amina paid sh. 28000 for a bed after she was allowed a discount of sh. 4000. How much was the marked price?
= Ksh 32,000.
4. Obiero bought two rabbits for sh. 480 each. If he was allowed a discount of sh. 20 on each rabbit, how much was the marked price of each rabbit?
= Ksh 500.

5. A trader paid sh. 3600000 for a lorry whose original price was sh. 4200000. How much discount was he allowed?
= Ksh 600,000.
6. Musa paid sh. 5400 for an item after he was allowed a discount of sh. 600. What was the original price?
Ksh 6000.

Practice Exercise 95

1. Fill in the missing information in the table below:

Marked Price (sh.)	Selling Price (sh.)	Discount Percentage	Discount (sh.)
8000	6000	25%	2000
1560	1200	23.08%	360
3600000	2700000	25%	900000
12500	10000	20%	2500
9640	7720	20%	1920

2. Abdala paid sh. 2800 for a suit after he was allowed a discount of 30%. What was the marked price?
The marked price was Ksh 4000.
3. A Grade 7 learner was bought a geometric set whose marked price was sh. 250 after being allowed a discount of 25%. What was the selling price?
The selling price was Ksh 187.50
4. Kimani paid sh. 4500000 for a car after being allowed a discount of 25%. What was the marked price?
The marked price was Ksh 6,000,000.
5. Maipei was allowed a discount of sh. 750 and paid sh. 14250 for a sofaset. What was the percentage discount?
The percentage discount was 5%.
6. After a discount of 30% was allowed, Kanini paid sh. 2800 for a dress. What was the marked price?
The marked price was Ksh 4000
7. Abdul went to Eastleigh to buy a shirt. He paid sh. 1500 to buy the shirt after being allowed a discount of sh. 500. What was his percentage discount?
The percentage discount was 25%.

8. **A trader was allowed a discount of 8% on goods worth sh. 16,000. How much money did the trader pay?**
The trader paid **Ksh 14,720.**
9. **In Hamida's shop, the marked price of a suit is Ksh 10,000. Mr. Israel bought the suit at Ksh 8000 after being given a discount. What discount was Mr. Israel given?**
The discount was **Ksh 2000.**
10. **The marked price of a pair of shoes is Ksh 5000. Otiende bought more than 10 pairs of the same type of shoes and was given a 50% discount. At what price did he buy each pair of shoes?**
Each pair of shoes was bought for **Ksh 2500.**

Practice Exercise 96:

1. **A sales girl sold 10 suits each for Ksh 4000. The owner received Ksh 35,000. How much commission was she paid?**
The sales girl was paid **Ksh 5000** as commission.
2. **A sales lady is paid a commission of 10% on her sales. In one month she sold goods worth Ksh 36,000. How much commission was she paid?**
The sales lady was paid **Ksh 3,600** as commission.
3. **If a sales agent sells goods worth Ksh 4,000, he gets a commission of Ksh 400. How much commission does he get if he sells goods worth?**
(i) **Ksh 1,200.**
(ii) **Ksh 2,800.**
(iii) **Ksh 4,800.**
(iv) **Ksh 16,000.**
4. **Juma is a salesman. He is paid a commission of 12½ % on any value of goods he sells. How much does he earn if he sells goods worth?**
(i) **Ksh 3,125.**
(ii) **Ksh 150,000.**
(iii) **Ksh 81,250.**

5. **A sales agent is paid a commission of 20% on the value of goods sold above Ksh 50,000. How much commission did he get after selling goods worth Ksh 350,000?**
Ksh 60,000.
6. **A sales agent is paid a commission of 15% on the value of goods he sold above Ksh 100,000. How much was he paid in a month he sold 12 machines each worth Ksh 30,000?**
Ksh 39,000.
7. **A farmer plants different plants on his farm. He has a salesperson who helps in selling the produce. In every Ksh 1,000 he is given a commission of Ksh 300. How much commission did he get if he sold a total of Ksh 5,000 worth of produce?**
Ksh 1,500.
8. **A car agent is paid ¼ of the total sales he makes as commission. He sold two cars worth Ksh 2,000,000 each. What cash did he receive as commission?**
Ksh 1,000,000 as commission.
9. **A sales lady receives a commission of Ksh 300 for every Ksh 5,000 sold. What was the total sales that the lady made if she received Ksh 1,200?**
Ksh 20,000.
10. **Ksh 100 is paid as commission for every Ksh 1,000. Total sales were Ksh 3,000. What was the commission?**
Ksh 300.

Practice Exercise 97:

1. **Fill in the missing values in the table below:**

Sales (sh.)	Commission (sh.)	Percentage Commission
25,000	1,000	4%
28,000	7,000	25%
48,000	60,000	125%
600,000	120,000	20%
8,800,000	1,056,000	12%

2. **A sales agent sold goods worth Ksh 336,000. She was paid a commission of Ksh 42,000. What was her percentage commission?**
12.5%.
3. **A sales agent is paid a basic salary of Ksh 26,000. She is also paid a commission of 7% on the value of goods sold above Ksh 100,000. What was her total earning in a month she sold goods worth Ksh 200,000?**
Ksh 33,000.
4. **A sales girl is paid a basic salary of Ksh 26,000 plus a 7% commission on the value of goods sold above Ksh 5,000. What was her total earning in a month she sold goods worth Ksh 20,000?**
Ksh 27,050.
5. **A sales lady earns Ksh 25,000 basic salary. She is also paid 4% commission on the sales of goods worth Ksh 50,000. If she sells goods worth Ksh 400,000, what commission did she earn that month?**
Ksh 14,000 as commission.
6. **A salesman earns a commission of 7% on all sales he makes. During the month of December, he sold goods worth Ksh 450,000. How much commission was he paid?**
Ksh 31,500 as commission.
7. **Kagwathi earns a salary of Ksh 3,200 plus a 12% commission. In one month he was paid a total of Ksh 8,000. What was the value of goods he sold that month?**
Ksh 40,000.
8. **Onyangapuo is a barber who earns a 40% commission on any money he makes in one week. He made a total of Ksh 28,000 sales. What was his commission that week?**
Ksh 11,200 as commission.
9. **A trader earns a basic salary of Ksh 20,000 plus a 20% commission on sales he makes above Ksh 50,000. In one month he sold goods worth**

Ksh 100,000. What was his total earnings that month?

Ksh 30,000.

10. **Emmanuel gets Ksh 350 on every Ksh 9,000 worth of goods sold. Calculate his percentage commission.**
3.89%.

Practice Exercise 98:

1. (i) **How much did she pay for the items?**
Total cost = 1506
(ii) **If she paid using two sh. 1000 notes, how much balance did she get?**
She got a balance of sh. 494.
 2. (i) **How much did he pay for the items?**
Total cost = 23625
(ii) **If he paid using sh. 26,000, how much balance did he receive?**
Benson received sh. 2,375 as balance.
 3. (i) **How much did she pay for the items?**
Total cost = 3540
(ii) **If she paid sh. 3000, how much balance did she receive?**
Balance = -540 (She needs an additional sh. 540).
 4. (i) **How much money did he pay for the items?**
Total cost = 7400
(ii) **How much balance did he get if he gave out sh. 8000?**
The farmer received sh. 600 as balance.
 5. **Asha bought the following items from a supermarket:**
 - A dress for sh. 2400
 - Two blouses @ sh. 530 each
 - Four shirts @ sh. 530 each
 - A toy car for sh. 210
 - 1.5 kg of meat @ sh. 600
- (i) **How much did she pay for the items?**
Total cost = 7390

(ii) If she paid using sh. 7000, how much more would she add to the shopkeeper to get a balance of sh. 600?

Asha needs to add sh. 990.

6. Anita paid sh. 1200 for the items.
7. Musyokas balance is sh. 1100
8. Muthoni bill was ksh.280
9. The small-scale entrepreneur paid ksh.20000
10. Wekesa received sh. 400 as balance.

Practice Exercise 99

1. Atieno bought the following items from Bidii Shop:

- Three loaves of bread
- 3.5 kg of rice
- Four tins of cooking oil
- $\frac{3}{4}$ bar of soap
- Two packets of milk

(i) Total Bill = 2400

(ii) Atieno got a balance of sh. 600

2. (i) Total Bill = 1552
(ii) Muteti would need to pay an additional sh. 198 to cover the cost.
3. (i) Total Bill = 25280
(ii) Kariru got a balance of sh. 720.
4. (i) Total Bill = 20420
(ii) Maria would need to pay an additional sh. 1580.

5. Oloo got a balance of sh. 90.
6. Total cost = 1500
7. Total = 414
8. Total = 824
9. Total = 220
10. Total = 540

Practice Exercise 100

1. (a) (i) 36g: 45 Ksh (up to 50g)
(ii) 58g: 60 Ksh (over 50g up to 100g)
(iii) 192g: 75 Ksh (over 100g up to 200g)

(iv) 349g: 85 Ksh (over 200g up to 350g)

(v) 1.6kg: 135 Ksh (over 500g up to 1kg)

- (b) (i) 1.1kg: 70 Ksh (up to 5kg)
(ii) 8.4kg: 95 Ksh (over 5kg up to 10kg)
(iii) 22.5kg: 180 Ksh (over 10kg up to 25kg)
(iv) 37kg: 310 Ksh (over 25kg up to 35kg)
(v) 42kg: 410 Ksh (over 35kg, each additional 1kg is 20 Ksh)

(c) Total cost = 135 + 35 = 170 Ksh

2. (a) Ksh. 7365

(b) Ksh. 770

3. Ksh. 440 Ksh

Practice Exercise 101

1. Charges for sending money:

(i) Free

(ii) Sh. 34

(iii) Sh. 205

(iv) Sh. 285

2. Withdrawal charges:

(i) Sh. 18

(ii) Sh. 105

(iii) Sh. 125

(iv) Sh. 125

(v) Sh. 125

3. sh. 5420

4. sh. 20453

5. sh. 35770

4.0. Geometry

4.1. Angles

a) Rotating different types of angles on a straight line.

Activity

1. $e = 58^\circ$

$g = 53^\circ$

$f = 32^\circ$

$h = 127^\circ$

Angle $e + f = 90^\circ$

Angle $g + h = 180^\circ$

a) $a =$ Right angle

b) $h =$ Obtuse angle

Practice Exercise 102

1. i) $\angle p = 40^\circ$
 $\angle r = 50^\circ$
 $(p + r) = 90^\circ$

Complementary angles

- ii) $w = 30^\circ$
 $x = 150^\circ$
 $(w + x) = 180^\circ$

Supplementary angles

- (iii) $a = 40^\circ$
 $b = 90^\circ$
 $c = 50^\circ$
 $(a + b + c) = 180^\circ$

Supplementary angles

- (iv) $e = 40^\circ$
 $f = 50^\circ$
 $(e + f) = 90^\circ$

Complementary angles

2. (i) $v = 30^\circ$
 $w = 23^\circ$
 $x = 35^\circ$
 $y = 55^\circ$
 $z = 37^\circ$
 $(v + w + x + y + z) = 180^\circ$

Supplementary angles

- (ii) $t = 90^\circ$
 $q = 90^\circ$
 $(t + q) = 180^\circ$

Supplementary angles

2. (i) $d = 64^\circ$
(ii) $g = 82^\circ$
(iii) $k = 162^\circ$

3. **Complementary angles**

- (i) 86°
(ii) 12°
(iii) 73°
(iv) 54°

Supplementary angles

- (i) 176°
(ii) 102°
(iii) 163°
(iv) 144°

4. C
5. (i) Right angle
(ii) Reflex angle
(iii) Acute angle
(iv) Obtuse angle
6. (i) Right angle
(ii) Reflex angle
(iii) Reflex angle

Practice Exercise 103

1. $z, y, 360^\circ$
2. (i) w and y
(ii) x and z
3. (i) $j = 80^\circ$
 $k = 90^\circ$
 $l = 90^\circ$
 $m = 90^\circ$
 $(j + k + l + m) = 360^\circ$
Supplementary angles

- (ii) 1. o and s
2. p and t
3. u and q
4. n and r
 $= 360^\circ$
Supplementary angles

4. (i) $k = 141^\circ$
(ii) $a = 76^\circ$
 $b = 104^\circ$
 $c = 52^\circ$

5. $k = 100^\circ$
 $m = 35^\circ$
6. $x = 175^\circ$
7. $x = 195^\circ$
8. $x = 135^\circ$
9. $p = 60^\circ$
10. $w = 90^\circ$

Practice Exercise 104

- e and u
s and w
 - c and e
d and f
- $x = 25^\circ$
 - $a = 130^\circ$
 $b = 50^\circ$
 $c = 50^\circ$
 $d = 130^\circ$
 - $r = 62^\circ$
 $s = 118^\circ$
 $t = 62^\circ$
- $i = 73^\circ$
 $j = 65^\circ$
 $k = 107^\circ$
 $l = 115^\circ$
 $m = 65^\circ$
- a and d
 - b and f
 - a and e
 - j and k

Practice Exercise 105

- u
 - w
 - x
 - q corresponds with v
- $a = 126^\circ$
 $b = 54^\circ$
 $d = 126^\circ$
 $e = 126^\circ$
 $f = 54^\circ$
 $g = 54^\circ$
 - g and c
a and e
b and f
- $a = 120^\circ$
 $b = 60^\circ$
 $c = 120^\circ$
 $d = 120^\circ$
 $e = 60^\circ$

$$\begin{aligned}f &= 60^\circ \\g &= 120^\circ \\h &= 120^\circ \\i &= 60^\circ \\j &= 60^\circ \\k &= 120^\circ\end{aligned}$$

- l and h
 - p and l
 - r and n
 - m and i

Practice Exercise 106

- a) s and m
b) q and o
 - a) e and f
b) c and h
c) i and j
d) g and l
- k and n = 68°
m and l = 112°
p and q = 112°
o and r = 68°
 - d and g = 64°
f and e = 116°
n and m = 64°
l and o = 116°
- d and i
b and k
h and m
f and o

Practice Exercise 107

- (ii) and (iv)
- a and c = 58°
b and d = 122°
 - o = 116°
n and q = 64°
m = 116°
p = 64°

- iii) $j = 76^\circ$
i and $k = 104^\circ$
- iv) $w = 38^\circ$
 $x = 120^\circ$
 $v = 38^\circ$
 $z = 120^\circ$
 $y = 22^\circ$

3. Parallelogram

4. 60°

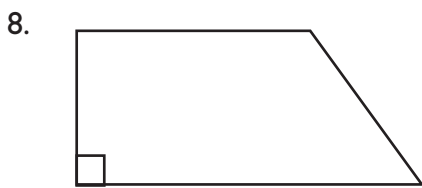
5. 115°

6. $y = 45^\circ$

$x = 30^\circ$

$z = 135^\circ$

7. $x = 20$



9. i) b and d

c and a

ii) b and c

a and d

10. i) w and y

x and z

ii) w and z

x and y

Practice Exercise 108

1. i) 4 ii) 4
iii) 4 iv) 4
v) 6 vi) 6
2. 540°
3. i) a and $d = 110^\circ$
b and $c = 70^\circ$

ii) a and $d = 105^\circ$
b, c and $e = 110^\circ$

iii) a = 76°
b = 52°
c = 52°

- iv) a = 127°
b = 105°
c = 128°
d = 127°
e = 105°
f = 128°

Practice Exercise 109

1. a) i) $e = 60^\circ$
g = 60°
f = 60°

ii) 180°

b) $h = 120^\circ$

j = 120°

i = 120°

ii) 360°

2. i) a = 120°
b = 120°
c = 120°
d = 120°
e = 120°
f = 120°

ii) 720°

- b) (i) g = 60°
h = 60°
i = 60°
j = 60°
k = 60°
l = 60°

ii) 360°

3. B

Practice Exercise 110

1. a) 6
b) 5 sides
2. a) p and r = 125°
q = 55°
b) q = 134°
p = 46°
c) w = 158°

3. a) i) 90° ii) 90°
 b) i) 108° ii) 72°
4. 540°
5. 120°
6. $x = 120^\circ$
7. a) 108°
 b) 72°
8. a) 120°
 b) 60°
9. 5
10. 4

Practice Exercise 111

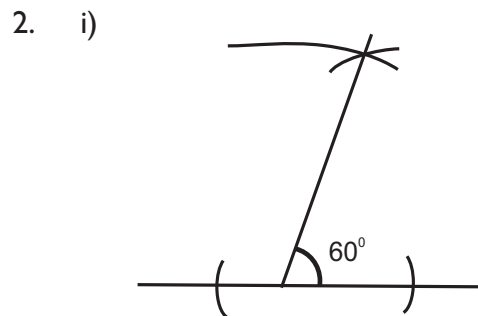
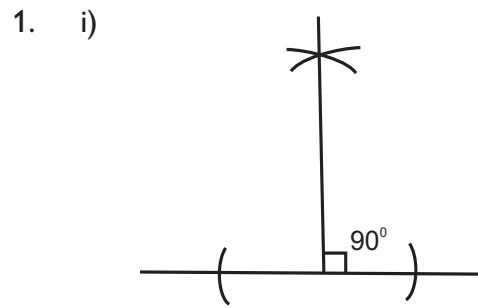
1. a) $p = 50^\circ$
 $q = 70^\circ$
 $r = 60^\circ$
 $s = 80^\circ$
 $t = 100^\circ$
- b) $e = 30^\circ$
 $f = 55^\circ$
 $g = 55^\circ$
 $h = 40^\circ$
- c) a) 19°
 b) 17°
 c) 16°
2. d) a) 56°
 b) 73°
 c) 51°

Practice Exercise 112

1. Learners to bisect the angles provided using a ruler and a pair of compasses.
 2-3 learners to draw and bisect the given angles using a ruler and a pair of 10 compasses.
 4-10 picture on the folder.

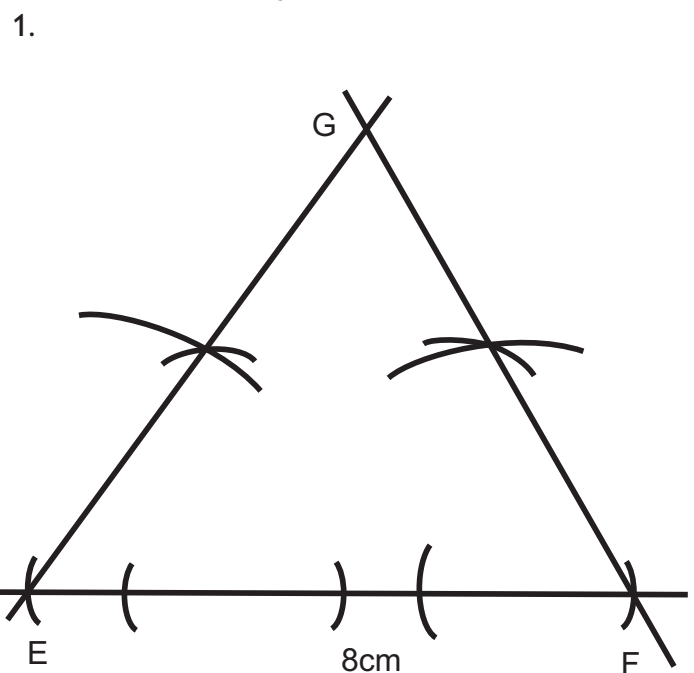
Practice Exercise 113

On this exercise learner's to construct angle's using a pair of compasses and ruler only as taught by their teacher. Number (i), (i) and number 2 (i) has been done for you.



Practice Exercise 114

On this exercise
 In this exercise learner's to follow the instructions given to construct triangles a taught by their teacher. The first one has been done for you.



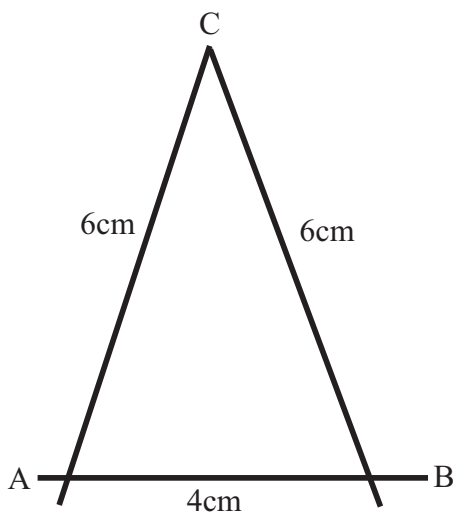
$EG = 8\text{cm} \pm 0.1\text{cm}$

2. (i) 60°
 (ii) $7.5\text{cm} \pm 0.1\text{cm}$
3. (i) $37^\circ \pm 0.1\text{cm}$
 (ii) $53^\circ \pm 0.1\text{cm}$

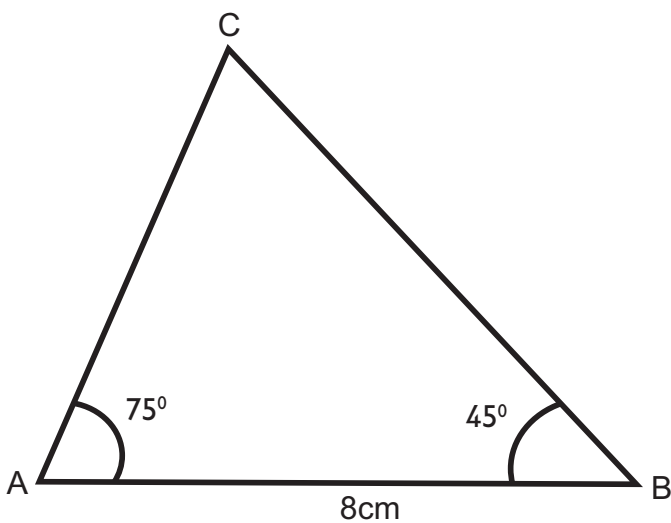
4. (i) $23^\circ \pm 0.1\text{cm}$
 (ii) $67^\circ \pm 0.1\text{cm}$
 (iii) 13cm
5. (i) 120°
 (ii) $4.8\text{cm} \pm 0.1\text{cm}$
 (iii) $4.8\text{cm} \pm 0.1\text{cm}$
6. (i) $90^\circ \pm 0.1\text{cm}$
 (ii) $4.6\text{cm} \pm 0.1\text{cm}$
 (iii) $7.8\text{cm} \pm 0.1\text{cm}$

Right -angled triangle

7. Not drawn to scale



8. Not drawn to scale

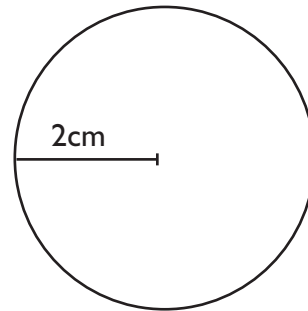


9. 65°

Practice Exercise 115

Learners to construct circle using the radii and diameter's provided in the questions. The first one has been done for you.

1. (i)



5.0 Data Handling and Probability

Practice Exercise 116

1. (i) Buses and mini buses
 (ii) 68 vehicles
 (iii) Lorries
 (iv) 202 vehicles
 (v) 296vehicles
2. (a)

Games	Number
Football	8
Basketball	4
Rugby	1
Volleyball	4
Hockey	1
Netball	1
Table tennis	3

- b) Football
- c) Rugby, hockey and netball
- d) Basketball and volleyball
- e) 7

Practice Exercise 117

1. For this exercise learners to make and fill in tables with information as directed in the questions

Practice Exercise 118

1. Frequency distribution Table for items in the box

Item	Frequency
Pencils	17
Pens	24
Rubbers	8
Sharpener	4
Exercise books	31
Storybooks	13
Geometric sets	9

- (i) Total number items
106

2. Frequency distribution for Mathematics Test Scores

Mark scored	Number of learners
20	10
18	12
15	6
12	4
10	2

- (i) Learners who got half of the total marks
2 learners
- (ii) Total number of learners who did the rest
34

3. Frequency distribution table for favorite meals

Meal	Number of learners
Chips	15
Chicken	10
Githeri	3
Ugali	3
Eggs	1

- (i) Foods loved by the same number of learners
Githeri and Ugali
- (ii) Most loved meal
Chips

- (iii) Least loved meal
Egg

- (iv) Difference between most loved and least loved meal.
14





- (v) Total number of learners in the class.
32



Practice Exercise 119

1. (i) 1.6cm rep 100litres
(ii) 2cm
(iii) Tuesday and Saturday
(iv) 240litres
(v) 2600litres
2. (i) Grade 5
(ii) Grade 1
(iii) Grade 3 and 4
(iv) Grade 6 and 7
(v) Grade 5 and 7
3. (i) 2cm rep 2votes
(ii) 2cm rep one person
(iii) The horizontal scale
(iv) The vertical scale.

Practice Exercise 120

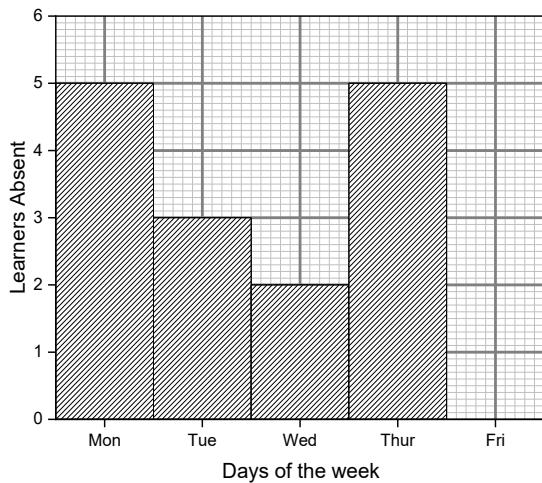
1. i)  rep 3cows
ii) 228cows

2. (i) People
- | People | Number |
|----------|---|
| Men |  |
| Women |  |
| Youths |  |
| Children |  |

- (ii) 10 and 4 respectively
(iii) 1 
(iv) 27 
3. (i) Busara school
(ii) Bidii school
(iii) Upendo school
(iv) Busara and Bidii school

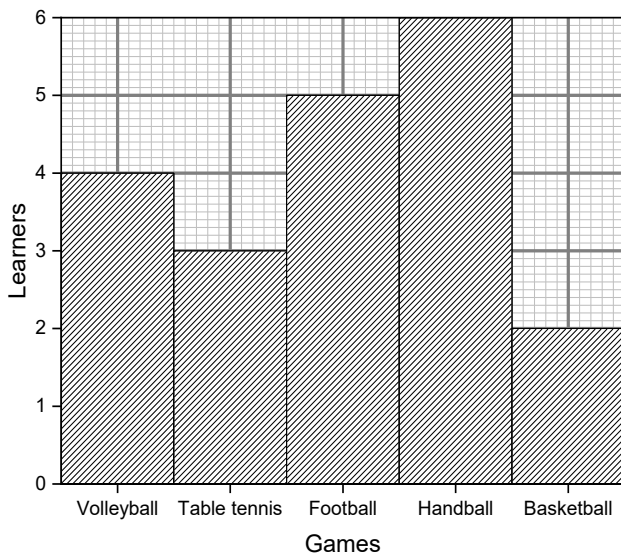
Practice Exercise 121

1. (i) 1cm rep 1 learner
1cm rep 1day

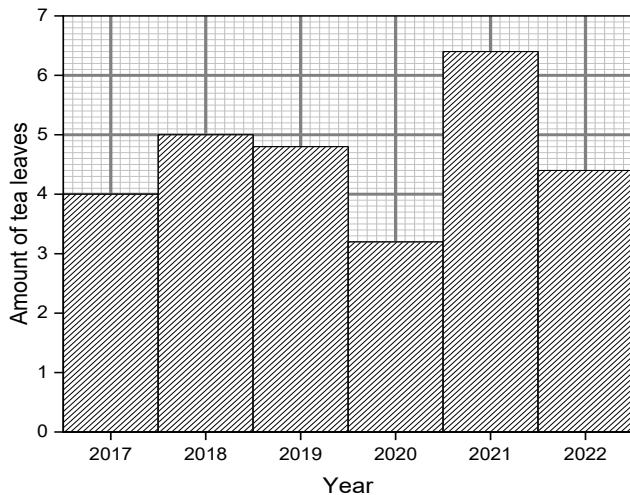


- (ii) 15learners

2. 1cm rep 5 learners
1cm rep 1 game



3. 2cm rep 1year
2cm rep 50tonnes



4. For question 4 and 5, learners to draw bar graphs using the information provided by choosing a suitable scale to represent it.

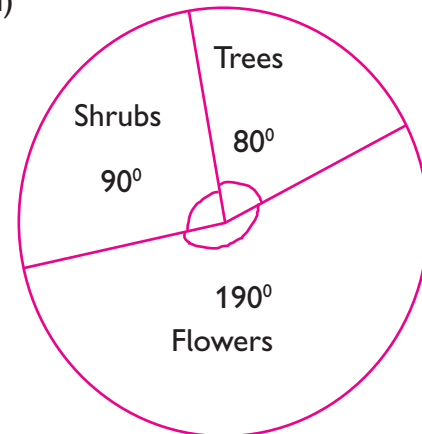
Practice Exercise 122

1. (i) 1cm rep 10 people
(ii) Mild stage
(iii) 65 people
(iv) 160 people
2. (i) 1cm rep 5 learners
(ii) Poverty
(iii) 22 learners
(iv) Early marriages
(v) 8 causes

Practice Exercise 123

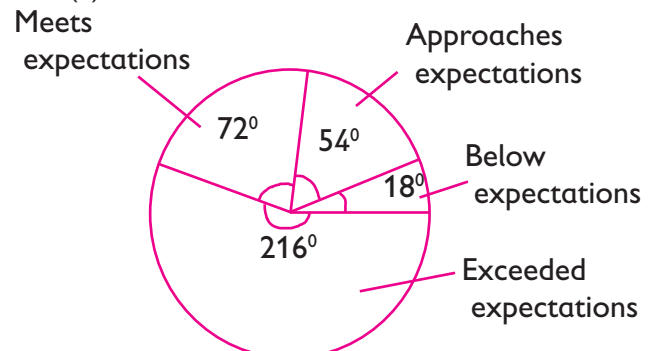
1. (i) a) Trees - 80°
b) Flowers - 190°
c) Shrubs - 90°

ii)



2. i) a) Exceeded expectations = 216°
b) Meets expectations = 72°
c) Approaches expectations = 54°
d) Below expectations = 18°

(ii)



3. For questions 3, 4 and 5 learners to draw pie charts to represent the information provided. The angle have been done for you

1. a) i) Apples = 120°
 ii) Bananas = 60°
 iii) Grapes = 96°
 iv) Oranges = 84°

4. Sleeping = 120°
 Working = 120°
 Leisure = 60°
 Eating = 30°
 Others = 30°

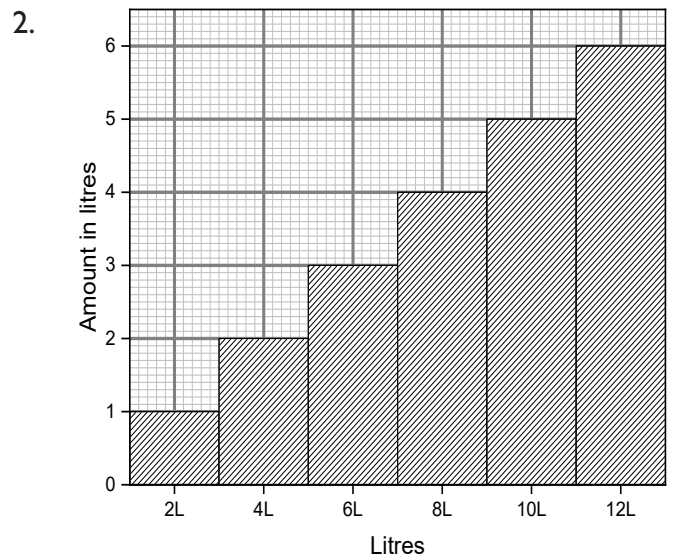
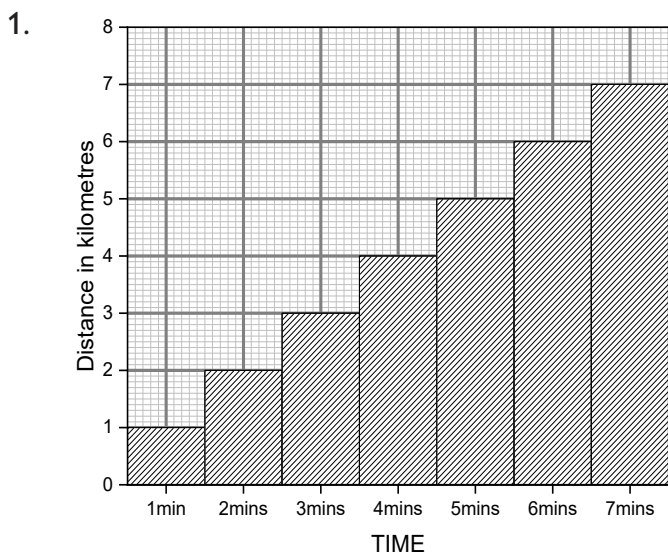
5. Green = 90°
 Yellow = 54°
 Purple = 36°
 Red = 108°
 Blue = 72°

Practice Exercise 124

1. i) 32hectares
 ii) 110
 iii) 12 hectares

2. 360°
 3. Ksh. 32000
 4. 57

Practice Exercise 125



3. (i) 2cm rep 100c
 (ii) 2.5cm rep 2minutes
 (iii) 20°C
 (iv) 72°C
 (v) 303k
 (vi) 10minutes

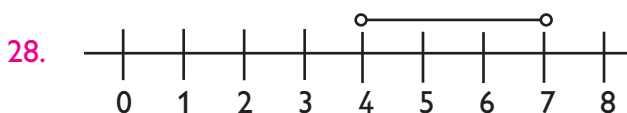
For questions 4 and 5 learners should draw line graphs to represent the information provided.

Practice Exercise 126

1. i) 1 big square rep 50km
 ii) 1 big square rep 1hour
 iii) 300km
 iv) 600km
 v) $s = 100\text{km/hr}$
 vi) 9am
 vii) 6hours
 viii) 150km/hr
2. i) 1big square rep 20km
 ii) 1 big square rep 10minutes
 iii) 30km
 iv) 20km/hr
 v) 80km/hr
3. a) 1 big square rep 10km
 b) 1 big square rep 1 litre
 c) 4 litres

Term 1 Assessment

1. a) 100,000,000
b)
 - Hundreds of millions
 - Ten of millions
 - Millions
 - Hundreds of thousands
 - Tens of hundreds
 - Thousands
 - Hundreds
 - Tens
 - Ones
2. 8000 groups of 100
3. Nine hundred seventy-five million, five hundred eighty-three thousand, and ten
4. a) 347,000,000
b) 300,000,000
5. 441
6. 121
7. 220,590 seats
8. 44
9. 1:45 pm
10. 18
11. 5
12. 68m
13. 50°
14. 6:05 pm
15. $\frac{4}{9}$
16. $9\frac{1}{20}$
17. $3\frac{9}{28}$
18. 60%
19. $5\frac{3}{5}$
20. a) Ten-thousands
b) 0.009
21. 2.51125
22. 348.00
23. 4.25 m^2
24. 0.25
25. $C + G = 49$
26. $2(x + 7y)$
27. $41\frac{1}{3}$



29. 30^0

30. $44,000 \text{ cm}^3$
31. 99487, 99679, 99748, 99884
32. 3,009 bags
33. 21, 22, 24, 25, 26, 27, 28, 30, 32, 33, 34, 35, 36, 38, 39
34. 12 cm
35. 13,000
36. $3\frac{1}{4} \text{ kg}$
37. 13:00
38. 6 hours 25 minutes
39. Three hundred forty-five million nine hundred seventy-four thousand eighty-one and twenty-five hundredths litres
40. 30
41. 97,092 trees
42. 2315
43. 9
44. $2\frac{1}{5}$
45. sh. 12,100
46. $\frac{3}{4}, \frac{7}{10}, \frac{5}{8}, \frac{2}{5}$
47. 60%
48. 47^0
49. 96
50. 0.51, 0.72, 1.02, 1.34, 1.4

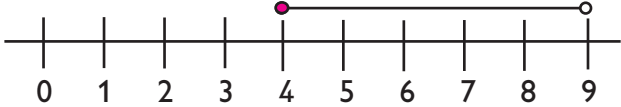
Term 2 Assessment

1. 948,000,205
2. Hundreds (100)
3. 800,000
4. 550,000,000
5. 63,954
6. 31
7. 360 m
8. 102,000 litres
9. $18\frac{3}{8}$
10. 565
11. 13,200 cm (132 m)
12. 1.8 hectares
13. 10%
14. $y \leq 6$
15. 6 fruits
16. 205,000dm
17. Hundred of thousandths
18. 60
19. 602 trees
20. 60 days
21. 24640 cm^3

22. 60 m
23. $(2x + 10) = 50$
24. 1260 m^2
25. 7 tonnes
26. 88 cm
27. $\frac{3}{64}$
28. Sh. 60
29. 80 km/h
30. $a = 55^\circ$
31. 10%
32. 16,000 groups
33. 3,383
34. 625 m^2
35. 32.769
36. 640 cm^2
37. 5,280 kg (or 5.28 tonnes)
38. 28 m
39. $9x + y < 155$
40. $\frac{26}{29}$
41. 42 m^2
42. 300 K
43. Sh. 42,500
44. $26\frac{17}{24}$
45. 108 km/h
46.
 - Lorries: 19
 - Buses: 17
 - Nissans: 13
 - Motorcycles: 28
 - Pickups: 12
 Total: 89 vehicles
47. 66 cm
48. 800 tiles
49. 211
50. 121

Term 3 Assessment:

1. Three hundred forty-nine million, seven hundred eighty-one thousand, four hundred and two vaccines
2. Tens of thousandths
3. 9,000,000
4. Ascending order: $\frac{1}{4}, \frac{3}{8}, \frac{7}{12}, \frac{5}{6}$
5. 20
6. 6.4
7. 707,034
8. 584,990 ml
9. 64 and 49 (Sum = 113)

10. 1.9 ml
11. 11:00 a.m.
12. 4
13. 77
14. $\frac{3}{5}$
15. $13\frac{5}{9}$
16. $17\frac{1}{12}$
17. 186.386
18. 23 hectares
19. $x = 5$
20. 7
21. 10
22. 110°
23. $3(5r+s)$
24. 9 hours, 20 minutes (8:30 p.m. to 5:50 a.m.)
25. Rehema is 16 years old.
26. 17 m
27. $FH = 8\text{cm}$
28. 85.7m
29. Angle $XYZ = 60^\circ$
30. 42 cm^2 (area of the shaded circle with radius 7cm)
31. 100
32. 770,000litres
33. 48°C
34. 

35. $\frac{3}{4}$
36. 90 km/h
37. 1320 and 2090
38. $27t+50$
39. $c = 100^\circ$ $d = 80^\circ$
40. 410.66cm^2
41. 35°
42. $13\frac{1}{25}\text{m}^2$
43. $y = 1000$
44. Sh. 40,000
45. Average speed = 60 km/h
46. Sh. 57,000
47. 6 sides (hexagon)
48. Sh. 120 (additional money needed)
49. 38.5 cm^2 (area of the shaded trapezium)
50. Sh. 345 (commission for money orders)

INTERGRATED SCIENCE

1. Scientific Investigation

1.1 Introduction to Intergrated Science

Activity 1:

- (a) Doctor
- (b) Veterinary doctor
- (c) Mechanic
- (d) Scientist
- (e) Surveyor
- (f) Electrician

1. Meaning of Integrated Science:-

- Integrated Science is a field of study that combines knowledge from various scientific disciplines like biology, chemistry and physics to understand and solve real-world problems. It encourages students to make connections across these subjects and develop a comprehensive understanding of the natural world.

2. Career Opportunities Related to Integrated Science:

(a) Biology:

- Medical Doctor
- Biotechnologist
- Environmental Scientist
- Marine Biologist
- Ecologist

(b) Chemistry:

- Pharmacist
- Chemical Engineer
- Forensic Scientist
- Laboratory Technician

(c) Physics:

- Mechanical Engineer
- Electrical Engineer
- Physicist
- Radiologist

3. Pathways in Senior School:

(a) Arts and Sports:

- Performing Arts (e.g. Music, Drama, Dance)
- Visual Arts (e.g. Painting, Sculpture)
- Physical Education/Sports Management

(b) Social Sciences:

- History
- Geography
- Psychology
- Sociology
- Political Science

(c) STEM (Science, Technology, Engineering and Mathematics):

- Computer Science
- Engineering (e.g. Civil, Electrical, Mechanical)
- Applied sciences
- Pure Sciences
- Medicine
- Mathematics and Statistics
- Environmental Science

4. Meaning of Each Letter in STEM:

- S - Science
- T - Technology
- E - Engineering
- M - Mathematics

5. Importance of Studying Integrated Science:

(a) Agriculture:

- Enhances knowledge of plant growth, soil management, and sustainable farming practices.
- Helps in understanding how to improve food production and manage pests.

(b) Health:

- Provides knowledge on human biology, disease prevention, and health promotion.
- Encourages critical thinking on medical technologies and treatments.

(c) Food and Textile:

- Enables understanding of food production, preservation, and nutritional values.
- Develops skills related to textile production, design, and material science.

(d) Transport:

- Supports understanding of physics in motion, the development of safer transport systems, and environmental impact of transportation.

1.2 Introduction to Intergrated Science

Activity 1:

(a) **Hazard:** A hazard is a potential source of danger or harm that could cause injury, damage or adverse health effects.

(b) **Laboratory Hazard:** A laboratory hazard is a specific danger that exists in a laboratory setting, which could lead to accidents such as chemical spills, fires, or injuries from laboratory equipment.

Activity 3:

- (a) Open flames
- (b) Broken glass
- (c) Chemicals

Practice Assessment

1. Things likely to cause common laboratory accidents:

(a) Falls:

- Slippery floors
- Cluttered walkways
- Improper footwear

(b) Cuts:

- Broken glassware
- Sharp instruments like scalpels or knives
- Rough edges on metal objects

(c) Burns:

- Open flames

- Spilled hot liquids
- Contact with hot surfaces

(d) Suffocation:

- Lack of ventilation
- Leaking gases
- Improper handling of chemicals like nitrogen or carbon dioxide

(e) Poisoning:

- Exposure to toxic chemicals
- Accidental ingestion or inhalation of chemicals
- Working with hazardous substances without protective equipment

(f) Scalds:

- Hot liquids or steam
 - Spilled boiling water or other hot liquids
2. Five common hazards in the laboratory:
- (a) Chemical spills
 - (b) Biological contamination (e.g., bacteria or viruses)
 - (c) Fire or explosion risk
 - (d) Electrical hazards (e.g., exposed wires)
 - (e) Physical hazards (e.g. sharp objects, falling items)
3. Meaning of common hazard symbols:

(a)



This symbol represents flammable materials (substances that can catch fire easily).

(b)



This symbol indicates toxic or carcinogenic substances that may be harmful if inhaled, ingested, or absorbed.

(c)



This symbol represents corrosive substances that can cause damage to living tissue or materials.

(d)



This symbol signifies biohazard or radioactive the presence of biological materials that pose a risk to health.

4. Materials found in a first aid kit and their uses:

(a) Adhesive bandages (plasters) –

Used to cover small cuts or abrasions.

(b) Antiseptic wipes – Used to clean and

disinfect wounds.

(c) Gauze pads – Used to dress and

absorb blood from larger wounds.

(d) Cotton balls – Used to apply

ointments or clean wounds.

(e) Tweezers – Used to remove splinters

or foreign objects.

(f) Elastic bandage (e.g., bandage

wrap)-Used to wrap injuries like sprains or strains.

5. Procedure for first aid on someone who has ingested a harmful substance in the laboratory:

- **Step 1:** Determine what substance was ingested, and check if the label provides any specific instructions.
- **Step 2:** Call for medical help immediately.
- **Step 3:** If the person is conscious and not vomiting, try to have them drink water or milk (unless the substance is corrosive or acidic).
- **Step 4:** Do not induce vomiting unless instructed by medical professionals.

- **Step 5:** Provide as much information as possible about the substance and the situation when medical help arrives.
6. Three safety measures to be observed in the laboratory:
- (a) Wear appropriate personal protective equipment (PPE), such as lab coats, gloves, and safety goggles.
 - (b) Ensure that all chemicals and equipment are properly labeled and stored.
 - (c) Be familiar with the location and use of safety equipment (e.g, fire extinguisher, first aid kit, eyewash station)

1.3 Laboratory apparatus and Instruments

Practice Assessment

1. Five basic skills in Integrated Science:
 - **Observation:** This involves carefully watching and recording data or phenomena. It helps in gathering evidence to support conclusions or hypotheses.
 - **Measurement:** Accurate measurement of quantities like length, mass, volume, and time is crucial for scientific experiments and understanding phenomena.
 - **Analysis:** Analyzing data involves organizing, interpreting, and drawing conclusions based on evidence gathered from experiments or observations.
 - **Problem-solving:** Integrated science requires the ability to identify problems, form hypotheses, and design experiments to test these hypotheses.
 - **Communication:** Effectively presenting scientific findings through written reports, presentations, and discussions is key for sharing knowledge with others.
2. Five reasons why reading labels on packaged quantities or products is important:
 - **Safety:** Labels provide important information about potential hazards

and necessary precautions when handling the product.

- **Correct Usage:** They explain how to use the product properly to avoid misuse or accidents.
 - **Storage Instructions:** Labels give guidance on how to store the product, ensuring its effectiveness or preventing damage.
 - **Expiration Dates:** They inform users of the product's shelf life, helping to avoid the use of expired or ineffective products.
 - **Compliance with Regulations:** Labels ensure that products meet safety and regulatory standards, helping to avoid legal or health issues.
3. **SI units of the following quantities:**
- (a) Luminous intensity: Candela (cd)
 - (b) Temperature: Kelvin (K)
 - (c) Electric current: Ampere (A)
 - (d) Time: Second (s)
 - (e) Volume: Cubic meter (m^3)
 - (f) Amount of substance: Mole (mol)
 - (g) Density: Kilogram per cubic meter (kg/m^3)
4. **Examples of each of the following quantities:**
- (a) Derived quantities:**
- Speed (m/s): Derived from distance and time.
 - Force (N): Derived from mass and acceleration ($F = ma$).
 - Area (m^2): Derived from length and width ($A = l \times w$).
- (b) Basic quantities:**
- Length (m)
 - Mass (kg)
 - Time (s)

End of strand Assessment

1. An instrument used for heating in the laboratory:
 - **Bunsen burner.**
2. The instrument used for measuring length in the laboratory:
 - **Ruler or Vernier caliper.**
3. The instrument used for measuring temperature:
 - **Thermometer.**
4. One instrument used to measure volume in the laboratory:
 - **Measuring cylinder.**
5. Two safe ways of handling a microscope:
 - **Always hold the microscope by the arm and base when moving it.**
 - **Keep the lens clean and avoid touching it with your fingers.**
6. The instrument used to measure time in the laboratory:
 - **Stopwatch.**
7. The instrument used for magnification:
 - **Microscope.**
8. J - Eyepiece (ocular lens)
H - Objective lenses
G - Stage
A - Coarse adjustment knob
B - Fine adjustment knob
C - Indication joint
D - Base
E - Mirror
F - Condenser
I - Body tube
9. (i) Bunsen burner
(ii) a) Chimney
b) Airhole
c) Base
d) Collar
e) Gas pipe
(iii) Used as a source of heat in the laboratory.

2. Mixtures, elements and compounds

2.1 Mixtures

Practice Assessment

- Examples of the following types of mixtures:
 - Homogeneous mixtures:**
 - Milk + water
 - Salt + water
 - Sugar + water
 - Heterogeneous mixtures:**
 - Oil + water
 - Sand and water
 - Gravel and pebbles
- List examples of the mixtures below:
 - Liquid - liquid mixtures:**
 - Oil and water
 - Milk and water
 - Solid - liquid mixtures:**
 - Sand and water
 - Sugar dissolved in water
 - Solid - solid mixtures:**
 - Alloy (e.g., brass, made of copper and zinc)
 - Sand and salt mixture
- Describe how you can separate mixtures using solvent extraction:
 - Solvent extraction is a method used to separate a component of a mixture by dissolving it in a suitable solvent:
 - Choose a solvent that selectively dissolves one of the components of the mixture.
 - Add the solvent to the mixture and stir it to allow the solvent to dissolve the target component.
 - Separate the solvent and dissolved component from the other materials by filtration or decanting.
 - Evaporate the solvent if needed to recover the dissolved substance.
- List five other methods of separating mixtures apart from solvent extraction:
 - Filtration:** Used for separating solids from liquids or gases (e.g. separating sand from water).
 - Distillation:** Used for separating liquids based on differences in boiling points (e.g., separating ethanol from water).
 - Magnetic separation:** Used to separate magnetic materials from non-magnetic ones (e.g., separating iron filings from sand).
 - Evaporation:** Used to separate a dissolved solid from a liquid by heating (e.g. separating salt from seawater).
- List three materials needed when separating mixtures using paper chromatography:
 - Chromatography paper (filter paper)
 - Solvent (e.g., water or alcohol)
 - Pencil (for marking the start line)
- Identify the methods of separating mixtures applied in the following areas:
 - Separating components of air:**
 - Fractional distillation (to separate gases like oxygen and nitrogen)
 - Extracting oil from nuts:**
 - Pressing (mechanical method) or solvent extraction
 - Refining crude oil:**
 - Fractional distillation (to separate different hydrocarbons based on boiling points)
- Grade 7 learners wanted to carry out an experiment to separate ethanol from water:
 - Identify the method of separating mixtures they would use:
 - Distillation
 - List the materials and instruments they needed:
 - Distillation apparatus (distillation flask, condenser)

- Thermometer
 - Heat source (e.g., Bunsen burner)
 - Receiver flask
 - Water and ethanol mixture
- (c) Write down the procedure they would follow:
1. Set up the distillation apparatus by connecting the distillation flask to the condenser.
 2. Pour the water and ethanol mixture into the distillation flask.
 3. Heat the mixture gently with the Bunsen burner.
 4. As the mixture heats, ethanol (with a lower boiling point than water) will evaporate and travel through the condenser.
 5. The ethanol vapor will condense in the condenser and drip into the receiver flask.
 6. Once all the ethanol has been distilled, allow the apparatus to cool and collect the separated ethanol in the receiver flask.

2.2 Acids, bases and indicators

Practice Assessment

1. Name 4 acid solutions used at home:
 - (a) Vinegar
 - (b) Lemon juice
 - (c) Citric acid solution (from fruits like oranges)
 - (d) Hydrochloric acid solution (often used in cleaning products)
2. Name 4 basic solutions used at home:
 - (a) Baking soda solution
 - (b) Soap solution
 - (c) Ammonia solution
 - (d) Lye solution (sodium hydroxide in water)
3. Identify 2 importance of acids in our day-to-day life:
 - (a) Used in cleaning products to remove stains and scale (e.g., vinegar for cleaning).
 - (b) Used in digestion; stomach acid (hydrochloric acid) helps break down food.
4. State 3 importance of bases in our day-to-day life:
 - (a) Used in cleaning (e.g., soap and ammonia are basic solutions used for washing).
 - (b) Used in antacid medications to neutralize stomach acidity.
 - (c) Used in food processing (e.g. sodium bicarbonate as a leavening agent in baking).
5. Describe how you can prepare an acid-base indicator from plant extract:
 1. Choose a plant that contains natural pigments (e.g., red cabbage or beetroot).
 2. Chop the plant and boil it in water to extract the color.
 3. Strain the mixture to remove the plant material, leaving the liquid.
 4. The liquid extract will change color when added to acids or bases, making it an effective indicator.
6. Describe how acids and bases behave when added to litmus papers:
 - Acids: When an acid is added to blue litmus paper, it turns red.
 - Bases: When a base is added to red litmus paper, it turns blue.
7. State three properties of acids and bases:

Acids:

 - (a) Sour taste (e.g. lemon juice).
 - (b) Turn blue litmus paper red.
 - (c) Corrosive to metals (producing hydrogen gas).

Bases:

 - (a) Bitter taste.
 - (b) Turn red litmus paper blue.
 - (c) Slippery feel (e.g. soap).
8. Name 2 fruits that contain acid:
 - (a) Lemon
 - (b) Orange

9. What are the colors of plant indicator when mixed with acids and bases?
- Acids: The color of the plant indicator (e.g. red cabbage extract) will turn red/pink.
 - Bases: The color will turn green/blue.

End of strand Assessment

1. What is a mixture?
 - A mixture is a combination of two or more substances in which each substance retains its chemical properties and can be physically separated.
2. Give two examples of homogeneous mixtures:
 - (a) Saltwater
 - (b) Milk + water
3. The temperature at which a substance boils is called **boiling point**.
4. Give one example of liquid-liquid mixture:
 - Oil and water (immiscible)
5. How do we call solid substances that are left on a jar after decantation?
 - **Residue**
6. The method of mixture separation shown is called **distillation**.
7. Grade 7 learners wanted to separate mixtures using crystallization method:
 - (a) **List four materials or instruments they required:**
 - Beaker
 - Heating source (e.g. Bunsen burner)
 - Filter paper
 - Evaporation dish
 - (b) **Describe the steps they would follow:**
 1. Dissolve the mixture in water to create a saturated solution.
 2. Heat the solution gently to remove excess water.
 3. Filter the solution to remove any impurities.
 4. Allow the remaining solution to cool and form crystals.

5. Collect the crystals by filtration and allow them to dry.
8. State two types of mixtures:
 - (a) Homogeneous mixtures
 - (b) Heterogeneous mixtures
9. Using digital devices search for and write two applications of separating mixtures:
 - (a) Purifying drinking water (e.g. distillation).
 - (b) Extracting essential oils from plants (e.g. solvent extraction).
10. _____ is a method of separating components of coloured mixtures:
 - **Chromatography**
11. Give one example of a mixture that can be separated through crystallization method:
 - Salt from seawater
12. The process through which a substance changes from solid to gas is called **sublimation**.
Name one substance that can sublime:
 - **Iodine (solid iodine sublimates into gas).**
13. Classify the substances below as either acids or bases:
 - (i) Lemon juice: Acid
 - (ii) Ash solution: Base
 - (iii) Soap solution: Base
 - (iv) Sour milk: Acid
14. State two uses of bases and acids:
 - (a) **Acids:**
 - Used in cleaning products and to remove rust.
 - (b) **Bases:**
 - Used in making soap and neutralizing acids in medicines.
15. List three household solutions that are basic:
 - (a) Baking soda solution
 - (b) Ammonia solution
 - (c) Soap solution

3. Living things and their Environment

Practice Assessment

1. Menstruation is the monthly shedding of the lining of the uterus in females, resulting in the discharge of blood and other materials from the body.
2. Three parts of the male reproductive system:
 - (a) Penis
 - (b) Testes
 - (c) Vas deferens
3. Four changes in boys and girls during adolescence:
 - (a) Growth spurts
 - (b) Development of secondary sexual characteristics (e.g., body hair, deeper voice for boys; breast development for girls)
 - (c) Changes in body composition (e.g., increased muscle mass in boys, increased body fat in girls)
 - (d) Onset of menstruation in girls and production of sperm in boys
4. Fertilization is the process where the sperm from a male fuses with the egg from a female to form a zygote.
5. Process of fertilization:
 - During sexual intercourse, sperm are ejaculated into the female reproductive tract.
 - The sperm travel through the cervix into the uterus and towards the fallopian tube where the egg is released.
 - The sperm penetrate the egg, and their nuclei fuse to form a zygote.
6. Difference between fertilization and implantation:
 - Fertilization is the union of sperm and egg, leading to the formation of a zygote.
 - Implantation occurs when the fertilized egg (zygote) attaches itself to the uterine lining to develop into an embryo.
7. Zygote is the cell formed when a sperm fertilizes an egg, marking the beginning of a new organism.
8. Two functions of the skin in excretion:
 - (a) **Sweating:** Helps remove excess salt and urea.
 - (b) **Excretion of waste products:** Through sweat glands, the skin removes metabolic waste like water, salts, and small amounts of urea.
9. Q - sweat pore
R - Sweat gland
S - Hair follicle
T - Dermis
V - Epidermis
10. Four lifestyles that promote healthy skin:
 - (a) Maintaining proper hydration
 - (b) Eating a balanced diet
 - (c) Protecting skin from harmful UV rays
 - (d) Regularly cleaning and moisturizing the skin
11. Part of the skin where waste production takes place: Waste products are produced and secreted through sweat glands in the dermis layer of the skin.
12. Two waste products excreted by the kidneys:
 - (a) Urea
 - (b) Excess salts and water
13. Lifestyles that promote a healthy kidney:
 - (a) Drinking plenty of water
 - (b) Eating a balanced diet
 - (c) Exercising regularly
 - (d) Avoiding excessive salt intake
14. Excretory product excreted by the lungs: Carbon dioxide
15. Q - kidney
R - Ureter
S - Urinary bladder
T - Urethra

16. Functions of the parts of the urinary system.
- (i) There are two **kidneys** in the urinary system. The kidneys are used to clean blood and help in excreting waste.
The wastes that are excreted by the kidneys are in form of urine. Through urine, the kidneys excrete excess salts and water.
 - (ii) The **ureter** is a tube that transports wastes from the kidney and it is connected to the urinary bladder.
 - (iii) **Urinary bladder** stores urine before it is released out of the body through the urethra.
 - (iv) **Urethra** allows urine from the bladder to pass out of the body.

17. Kidney disorders and how they can be prevented:
- (a) **Kidney Stones:** Prevented by drinking plenty of fluids and maintaining a balanced diet.
 - (b) **Nephritis:** Prevented by controlling blood pressure, managing diabetes, and avoiding smoking.
 - (c) **Kidney Infection:** Prevented by good hygiene and adequate fluid intake.
 - (d) **Kidney failure:** Prevented by regular medical checkups.

4. Force and Energy

4.1 Electrical energy

Common electrical appliances

(Page 204)

- (i) **Radio:** Used to receive and play sound broadcasts, such as music, news, and talk shows, from radio stations.
- (ii) **Television:** Used to display visual images and play sound for entertainment, news and educational content by receiving broadcast signals.
- (iii) **Electric Iron:** Used to heat up and press clothes to remove wrinkles and smooth fabric surfaces.
- (iv) **Refrigerator:** Used to keep food and drinks cool by maintaining a low

- (v) **Washing Machine:** Used to wash clothes and other fabrics automatically by agitating them in water mixed with detergent.
- (vi) **Electric Oven:** Used to cook or bake food by heating it with electricity, typically with adjustable temperature settings.
- (vii) **Electric Cooker:** Used for cooking food by providing a source of heat through electrical elements, often with multiple burners and a temperature-controlled oven.
- (viii) **Blender:** Used to mix, puree, or blend food and liquids, typically to make smoothies, soups, or sauces.
- (ix) **Immersion Heater:** Used to heat water or liquids by immersing an electrical heating element directly into the liquid, often used for quickly heating water in a container.

Practice Assessment

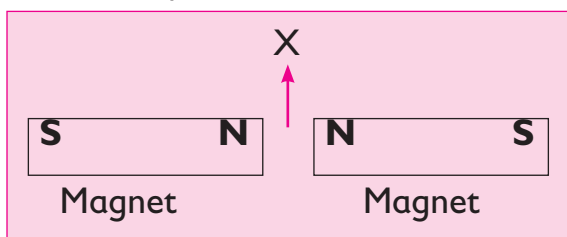
1. The ability to do work is referred to as energy.
2. Alex, a grade teacher, asked his learners to name the sources of electricity. Three possible answers they gave:
 - (a) Batteries
 - (b) Solar power
 - (c) Hydroelectric power
3. Electric circuit is a path that allows an electric current to flow. Name four components of an electric circuit:
 - (a) Battery
 - (b) Wires
 - (c) Switch
 - (d) Bulb
4. When the positive terminal of one cell is connected to a negative terminal of another cell, we say the cells are in series arrangement.

5. Complete the chart below.
- | Conductors | Non-conductors |
|------------|----------------|
| Aluminium | Wood |
| W | X |
- The letter W and X stand for **Copper** and **Rubber**.
6. Name two electrical appliances found in our homes:
- Television
 - Refrigerator
7. Electricity can be fatal if not handled properly. List three safety measures to be observed when handling electrical appliances:
- Always ensure the appliance is switched off before unplugging.
 - Avoid using electrical appliances with damaged cords.
 - Keep electrical appliances away from water to prevent electrical shocks.

4.2 Magnetism

Practice Assessment

- The table below shows several materials. Write against each as either magnetic or non-magnetic.
- | Material | Type |
|----------|--------------|
| Iron | Magnetic |
| Cobalt | Magnetic |
| Glass | Non-magnetic |
| Silver | Non-magnetic |
2. Materials which are attracted by a magnet are called magnetic materials.
3. Look at the picture below.



What is likely to happen at point X?

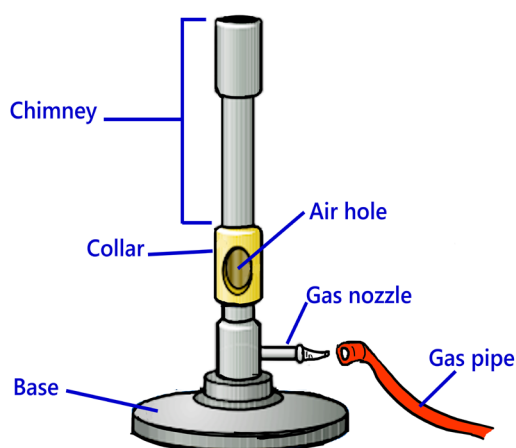
- The magnets will repel each other because like poles (S and S or N and N) are facing each other.
4. State three uses of magnets:
- In electric motors
 - In refrigerators (for door sealing)
 - In magnetic compasses for navigation
5. State the basic law of magnetism.
- Like poles repel each other, and unlike poles attract each other.

END OF TERM ASSESSMENTS

TERM 1 ASSESSMENT EXERCISE

1. Components of Integrated Science:
- Physics
 - Chemistry
 - Biology
2. Laboratory equipment to observe small organisms
- Microscope
3. Basic skills in Science:
- Observation
 - Measurement
 - Communication
4. a) X - kidney
b) Y - Ureter
c) Z - Urethra
5. Meaning of manipulative skills: Manipulative skills involve using hands and tools to handle materials, conduct experiments, or demonstrate actions, ensuring precision and control in a task.
6. Importance of studying Integrated Science:
- Helps understand the world around us
 - Develops critical thinking and problem-solving skills
 - Prepares students for scientific careers
 - Enhances understanding of scientific concepts that apply in daily life
 - Promotes environmental awareness and sustainability
7. a) Flammable

- b) Toxic
 - c) Carcinogenic
 - d) Radioactive
 - e) Corrosive
8. The temperature at which something boils is said to be its:
- Boiling point
9. Instruments to measure volume:
- (a) Measuring cylinder
 - (b) Burette
 - (c) Pipette
10. Career opportunities related to Integrated Science:
- (a) Laboratory Technician
 - (b) Environmental Scientist
11. SI Units:
- (a) Temperature: Kelvin (K)
 - (b) Amount of substance: Mole (mol)
 - (c) Time: Second (s)
12. Instrument for heating a solution:
- Bunsen burner
13. Method of separating sand from water:
- Decantation
14. Parts of a Bunsen burner:



15. Pathways in Integrated Science in Senior School:
- (a) Biology
 - (b) Physics
 - (c) Chemistry

16. Common hazards in the laboratory:
- (a) Burns
 - (b) Chemical exposure
 - (c) Cuts
 - (d) Electric shock
 - (e) Fires
 - (f) Toxic fumes
17. Matching laboratory instruments with their functions:
- | Instruments | Functions |
|---------------|--------------------|
| Bunsen burner | Heating substances |
| Ruler | Measuring length |
| Beam balance | Measuring mass |
| Microscope | Magnifying objects |
18. Pure water boils at: 100°C
19. Methods of separating mixtures:
- (a) Water and ethanol:
 - Distillation
 - (b) Sugar and water:
 - Evaporation or Crystallization
20. Possible causes of common accidents:
- (a) **Scalds:** Contact with hot liquids
 - (b) **Poisoning:** Ingestion of chemicals

- (c) **Suffocation:** Lack of oxygen or inhaling harmful gases
- (d) **Electric shock:** Faulty electrical equipment or exposed wires
- (e) **Cuts:** Sharp objects
- (f) **Falls:** Slippery floors or improper footwear
- (g) **Burns:** Contact with hot surfaces or flames

21. A room where experiments are carried out:
Laboratory
22. Safety measures in the laboratory:
- (a) Wear safety goggles
 - (b) Use gloves when handling chemicals
 - (c) Keep the area tidy and clean
23. Burns from hot liquid and open fire:
- Hot liquid: Scalds

- Open fire: burns
24. First aid for cuts:
- Clean the wound
 - Apply pressure to stop the bleeding
 - Cover the wound with a sterile bandage
25. Scientific skills to measure volume of a liquid: Observation, accuracy and precision
First aid for burns:
- Cool the burn with running cold water
 - Cover the burn with a clean cloth or dressing
 - Seek medical attention if the burn is severe
 - Do not apply ointments or ice directly to the burn

26. Matching quantities with their SI units:

Quantity	SI Unit
Mass	Kilogram (kg)
Electric current	Ampere (A)
Time	Second (s)
Luminous intensity	Candela (cd)

TERM II Assessment Exercise

- The temperature at which substances melt is called:
 - Melting Point
- A method used to separate components of colors is:
 - Chromatography
- Laboratory apparatus identification:
 - Stopwatch
 - Thermometer
- Heterogeneous mixture definition:
 - A heterogeneous mixture is a mixture where the components are not uniformly distributed, and the individual substances remain distinct.
- Mixtures are classified into two categories:
 - Homogeneous mixtures
 - Heterogeneous mixtures

6. Meaning of acid-base indicators:
Acid-base indicators are substances that change color in response to the acidity or basicity of a solution.

7. Preparing acid-base indicators from plant extracts:

(a) Materials required:

- Plant materials (e.g, red cabbage, beetroot, turmeric)
- Mortar and pestle
- Ethanol or water
- Filter paper
- Containers

(b) Procedure:

- Crush the plant material using a mortar and pestle.
- Add a small amount of ethanol or water to extract the pigment.
- Filter the mixture to obtain the colored extract.
- Use the extract as an indicator by adding it to acidic or basic solutions.

8. Table of observations for indicators:

Solution	Color in Red Cabbage Indicator	Colour in Litmus
Wood ash solution	blue/green	blue
Soap solution	blue/green	blue
Lemon juice solution	Red	red
Antacid tablet solution	blue/green	blue
Toothpaste solution	blue/green	blue

9. pH Scale:
- Neutral substance digit: 7
 - Weak base digits: 8-10
 - Strong acid digits: 0-3

10. Urinary system parts:

- X - kidney
- T - ureter
- V - urethra

11. SI unit for temperature:
Kelvin (K) or Degrees Celsius (°C)
12. Waste products excreted by the skin:
(a) Sweat (water and salts)
(b) Urea
13. Instrument identification:
• Conical flask
14. Acidic solutions found at home:
(a) Lemon juice
(b) Vinegar
15. Functions of skin parts:
(a) **Hair:** Helps in temperature regulation and protection.
(b) **Sweat glands:** Facilitate excretion of waste and cooling the body.
(c) **Epidermis:** Acts as a protective barrier.
16. Three actions for expectant mothers to protect the foetus:
(a) Eat a balanced diet rich in nutrients.
(b) Avoid alcohol, smoking, and harmful drugs.
(c) Attend regular prenatal check-ups.
17. Kidney disorders and causes:
(a) Kidney stones: Caused by dehydration or dietary factors.
(b) Kidney disease: Caused by diabetes or high blood pressure.
18. Parts labeled Q and R:
(a) Q - Sweat pore
(b) R Sweat gland
19. Example of a solvent used in chromatography:
• Ethanol or Water
20. Mixture separable by fractional distillation:
• Crude oil
21. Methods to separate homogeneous mixtures:
(a) Distillation
(b) Evaporation
(c) Crystallization
(d) Chromatography
22. Organs that help in waste removal:
(a) Kidneys
(b) Lungs
23. Lifestyle practices for healthy skin:
(a) Drink plenty of water.
(b) Use sunscreen and moisturizers.
24. Causes of kidney disorders:
(a) Dehydration
(b) Infections
(c) High blood pressure
25. Examples of mixtures:
(a) Solid-solid mixture: Sand and salt
(b) Gas-gas mixture: Air
(Oxygen + Nitrogen)
(c) Solid-liquid mixture: Sugar in water
(d) Liquid-liquid mixture: Oil and water
26. True or False:
(i) The skin is used as a sense organ: **True**
(ii) The skin helps to synthesize vitamin A: **False**
(iii) The skin helps in excretion: **True**
(iv) The skin protects the inner parts: **True**
27. Cosmetics used in your locality:
(a) Body lotion
(b) Lip balm
(c) Powder
28. The function of the kidneys is to filter waste products and excess fluids, including electrolytes, from the blood, forming urine for excretion. They also help regulate blood pressure, red blood cell production, and maintain the balance of salts and minerals in the body.
29. The instrument is
• Light microscope
30. Three applications of methods of separating mixtures in real life are:
(a) **Filtration** – Used in water purification systems to remove impurities.

- (b) **Distillation** – Used in the production of alcoholic beverages or petroleum refining.
- (c) **Chromatography** – Used in forensic science to separate substances for analysis, like in blood or drug testing.

TERM III Assessment Exercise

1. Non-magnetic materials
 - (a) Plastic
 - (b) Wood
2. Parts of the electric circuit:
 - (a) P - Battery or cell
 - (b) Q - Switch
 - (c) R - bulb
3. Why the bulb didn't light:
 - Thread is not a conductor of electricity; it does not allow electric current to flow.
4. Observation with soap solution and red cabbage:
 - The soap solution is basic.
5. Laboratory accidents:
 - (a) Spillage of chemicals
 - (b) Breaking of glassware
 - (c) Electric shock
6. Magnetic materials:
 - (a) Iron
 - (b) Nickel
 - (c) Cobalt
7. Function of connecting wire:
 - To provide a path for electric current to flow in the circuit.
8. Instrument and units for mass:
 - (a) Instrument - Weighing balance
 - (b) Units - Kilograms (kg) or grams (g)
9. SI units:
 - (i) Time - Seconds (s)
 - (ii) Light intensity - Candela (cd)
 - (iii) Temperature - Kelvin (K)
10. Electrical appliances at home:
 - (a) Refrigerator
 - (b) Electric kettle
11. Uses of magnets:
 - (a) In speakers
 - (b) In compasses
12. Arrangement of cells for a brighter bulb:
 - Series arrangement
13. What is implantation?
 - The attachment of a fertilized egg (embryo) to the uterine wall.
14. Steps in simple distillation:
 - (a) Heating the mixture
 - (b) Evaporation of the liquid
 - (c) Condensation and collection of the distillate
15. Careers related to Integrated Science:
 - (a) Biomedical scientist
 - (b) Environmental scientist
16. Boiling point of pure water:
 - 100 degrees Celsius
17. Method for separating ethanol and water:
 - Fractional distillation
18. Liquid turning blue litmus red:
 - Acidic
19. X in mixtures chart:
 - Homogeneous
20. Changes during adolescence:
 - (a) Growth of pubic hair
 - (b) Voice deepening in boys
 - (c) Menstruation in girls

21. Properties of magnets:
(a) Magnets attract magnetic materials.
(b) Magnets have north and south poles.
22. Waste products in urine:
(a) Excess water
(b) Excess salt
23. Cosmetics for healthy skin:
(a) Moisturizing lotion
(b) Sunscreen
24. Lifestyle practices for healthy skin:
(a) Drinking plenty of water
(b) Eating a balanced diet
(c) Exercising regularly
(d) Maintaining proper hygiene
25. vitamin synthesized by the skin:
• Vitamin D
26. True or false statements:
(i) True
(ii) False (fertilization occurs in the fallopian tube)
(iii) True
27. Why not to touch naked electric wires:
• It can cause electric shock, leading to injury or death.
28. Source of electrical energy shown:
• Wind turbines
29. Role of a switch in a circuit:
• To open or close the circuit, controlling the flow of electricity.
30. Electrical appliances used in cooking:
(a) Microwave oven
(b) Electric stove
31. Other sources of electricity:
(a) Solar energy
(b) Hydropower
32. Function of connecting wire:
• To conduct electricity between components in the circuit.
33. Examples of non-magnetic materials:
(a) Glass
(b) Plastic
(c) Rubber
34. How electricity is produced:
(a) **Biomass** - Burning organic material to produce steam that drives turbines.
(b) **Natural gas** - Combustion produces heat, used to generate electricity.
35. Flow of electric current:
• In a circuit, electric current flows from the positive terminal of the power source, through the connecting wires, to the load (e.g., a bulb), and back to the negative terminal. (Provide a labeled diagram showing this path.)

AGRICULTURE

Conservation of Resources

Controlling soil pollution

Practice Assessment page 219

1. What is soil pollution?
Soil pollution is the contamination of soil with harmful substances such as chemicals, waste, or other pollutants, which can harm plants, animals, and humans.
2. State four causes of soil pollution in gardening:
 - (i) Use of chemical fertilizers and pesticides
 - (ii) Improper disposal of industrial waste
 - (iii) Surface run-off
 - (iv) Excessive use of agricultural chemicals
3. **Explain how incorrect disposal of chemicals may lead to soil pollution.**
Improper disposal of chemicals, such as dumping pesticides, fertilizers, or industrial waste on soil, introduces toxic substances into the soil. These substances can alter soil composition, harm microorganisms, reduce soil fertility.
4. **Write down how you can demonstrate safe disposal of plastic wastes.**
 - Take plastic waste for recycling.
 - Reuse plastic containers instead of discarding them.
 - Dispose of non-recyclable plastics in designated waste bins.
 - Avoid burning plastics, as it releases harmful chemicals into the soil and air.
5. **Identify two agricultural chemicals that cause soil pollution:**
 - (i) Pesticides
 - (ii) Chemical or artificial fertilizers
6. **Using digital devices, watch a clip on how to control soil pollution and write down your findings:**
 - (i) Use organic fertilizers and compost instead of chemical ones.
 - (ii) Practise crop rotation to maintain soil health.
7. **Amani notices his produce has greatly declined and the soil cannot support plant growth anymore. What can he do to improve the quality of the soil?**
 - Add organic manure to enrich the soil.
 - Conduct soil testing to identify nutrient deficiencies.
 - Practise crop rotation and grow cover crops to reduce surface run-off.
 - Reduce or eliminate the use of chemical fertilizers and pesticides.
8. **Grade 7 learners were being taught about controlling soil pollution. Write three ways through which soil gets polluted:**
 - (i) Dumping plastic waste in the soil
 - (ii) Excessive use of chemical fertilizers and pesticides
 - (iii) Improper disposal of industrial waste
9. **Draw a poster you would use to teach people on ways of controlling soil pollution:**
*Learner to draw the poster.
10. **State three ways of creating awareness on prevention of soil pollution:**
 - (a) Organizing community clean-up drives
 - (b) Hosting educational workshops or campaigns
 - (c) Using social media and posters to share information

- (iii) Proper and safe disposal of industrial waste.
- (iv) Implement proper waste management practices, like recycling and reusing.

7. **Amani notices his produce has greatly declined and the soil cannot support plant growth anymore. What can he do to improve the quality of the soil?**

- Add organic manure to enrich the soil.
- Conduct soil testing to identify nutrient deficiencies.
- Practise crop rotation and grow cover crops to reduce surface run-off.
- Reduce or eliminate the use of chemical fertilizers and pesticides.

8. **Grade 7 learners were being taught about controlling soil pollution. Write three ways through which soil gets polluted:**

- (i) Dumping plastic waste in the soil
- (ii) Excessive use of chemical fertilizers and pesticides
- (iii) Improper disposal of industrial waste

9. **Draw a poster you would use to teach people on ways of controlling soil pollution:**
*Learner to draw the poster.

10. **State three ways of creating awareness on prevention of soil pollution:**

- (a) Organizing community clean-up drives
- (b) Hosting educational workshops or campaigns
- (c) Using social media and posters to share information

Constructing water retention structure Practice Assessment page 221

1. **State how surface runoff can be used in gardening:**
Surface runoff can be collected and stored in water retention structures, and later used for irrigation to water plants in the garden.

2. **What is water conservation?**
Water conservation is the practice of using water efficiently to reduce wastage and ensure its availability for current and future use.
3. **Identify two structures used to conserve surface runoff:**
 - (i) Water retention ditches
 - (ii) Water retention pits
4. **Write the procedure you will follow when constructing the following water retention structures:**
 - a) **Water retention ditches:**
 - Identify the area where runoff is most likely to flow.
 - Mark and measure the location for the ditch.
 - Dig the ditch to the required depth and width using tools such as jembe, fork jembe or pick axe.
 - Ensure the slope of the ditch allows water to flow into collection points.
 - b) **Water retention pits:**
 - Choose a location where water naturally collects.
 - Mark and measure the size of the pit to be dug.
 - Dig a pit deep enough to hold water.
 - Reinforce the walls and bottom of the pit with stones or clay if necessary.
5. **A farmer used the tool below when constructing a water retention ditch. Identify the tool:**
Pick axe
6. **Grade 7 students from Bidii school learnt about water conservation. Write down three importance of conserving water they learnt:**
 - (i) Ensures sufficient water supply for agriculture and domestic use.
 - (ii) Prevents water shortages during dry seasons.
 - (iii) Protects the environment by reducing the impact of water overuse.

7. **Water that freely flows on the surface of the earth after the rains is called:**
Surface runoff.
8. **The water retention structure characterized by holes around the base of crops is called:**
Water retention pit
9. **Identify the water retention structures below:**
 - a) Water retention ditch
 - b) Earth basin

Conserving food nutrients

Practice Assessment page 222

1. **What is nutrient conservation?**
Nutrient conservation refers to the practice of preserving the essential vitamins, minerals, and other nutrients in food during preparation, cooking, and storage.
2. **State 2 ways of conserving vitamins and minerals in vegetables during preparation:**
 - a) Wash vegetables before cutting them to prevent nutrient loss in water.
 - b) Avoid over peeling the vegetables
3. **Explain 3 ways of conserving vitamins and minerals in vegetables when cooking:**
 - a) Use minimal water when boiling vegetables to reduce the leaching of nutrients into the water.
 - b. Reduce cooking time.
 - c. Use blanching and parboiling.
4. **Why should we cover food when cooking vegetables?**
Covering food helps to retain steam, reduce cooking time, and prevent the loss of heat-sensitive nutrients.
5. **State 2 methods of cooking that prevent loss of nutrients in vegetables:**
 - a. Blanching

- b. Parboiling
Growing trees

Practice Assessment page 224

1. **Write four importance of growing trees:**
 - (a) Trees provide oxygen and improve air quality.
 - (b) They prevent soil erosion by holding the soil with their roots.
 - (c) Trees act as windbreakers and provide shade.
 - (d) They offer habitat and food for wildlife.

2. **How do trees conserve the soil?**
 - (a) Their roots hold the soil, preventing erosion.
 - (b) They provide organic matter through fallen leaves, improving soil fertility.
 - (c) Their canopy reduces the impact of raindrops on the soil.

3. **How do trees conserve water?**

Trees conserve water by reducing evaporation through their shade, absorbing and storing rainwater in their roots, and improving the soil's ability to retain water.

4. **State 3 ways of taking care of seedlings before they are fully established:**
 - (a) Regularly water the seedlings to keep the soil moist.
 - (b) Protect seedlings from pests and harsh weather conditions.
 - (c) Add mulch around the base to retain moisture and suppress weeds.

5. **Name three planting materials that can be used when planting trees:**
 - (a) Seeds
 - (b) Seedlings
 - (c) Stem cuttings

6. **Describe the following practices carried out on trees:**
 - a. **Weeding:** Removing unwanted plants

around trees to reduce competition for nutrients and water.

- b. **Thinning:** Removing excess trees to allow proper growth and access to sunlight.
- c. **Hardening off:** Reducing amount of water supply to young plants and exposing young plants to sunshine to strengthen them before transplanting.
- d. **Watering:** Providing sufficient water to ensure the healthy growth of trees, especially during dry periods.
- e. **Mulching:** Applying a layer of organic material (e.g., dry grass or leaves) around the base of trees to retain soil moisture and control weeds.

7. **Identify the following practices carried out on trees:**
 - a. Fencing/protection
 - b. Pruning

End of strand assessment page 224

1. **Mention four practices that can cause soil pollution:**
 - (a) Dumping non-biodegradable waste like plastics in the soil
 - (b) Excessive use of artificial fertilizers and pesticides
 - (c) Improper disposal of industrial waste and chemicals
 - (d) Excessive use of agricultural chemicals

2. **Write down a one-stanza poem to sensitize farmers about soil pollution and its causes:**

Learner to write the poem

3. **What can happen when artificial fertilizers are used excessively?**

Excessive use of artificial fertilizers can lead to soil degradation, reduced fertility, and harm to beneficial soil living organisms.

4. **Mention three water retention structures used to conserve water:**
 - (a) Water retention ditches

- (b) Water retention pits
- (c) Earth basins

5. **What is a water retention ditch?**

A water retention ditch is a trench or channel dug along slopes or flat land to capture and store surface runoff water, which can be used later for irrigation.

6. **List four crops that can be established in water retention structures:**

- (a) Banana suckers
- (b) Sugarcane
- (c) Sweet potatoes
- (d) Napier grass

7. **Explain ways one can use to conserve vitamins and minerals in vegetables:**

- Wash vegetables before cutting to prevent nutrient loss.
- Use minimal water when cooking to retain nutrients.
- Cook vegetables for the shortest time possible.
- Steam or stir-fry instead of boiling vegetables.

8. **List two ways of cooking vegetables to preserve nutrients:**

- (a) Parboiling
- (b) Blanching

9. **Grade 7 learners intend to plant trees in their school. List three planting materials they can use:**

- (a) Seeds
- (b) Seedlings
- (c) Cuttings

10. **Mention 2 practices that help in the care and management of trees:**

- (a) Regular watering, especially during dry seasons
- (b) Weeding to prevent the weeds from competing with the trees for nutrients

Food Production Processes

1. **What is a planting site?**

A planting site is a specific area of land prepared for planting crops or trees

2. **List two types of planting sites:**

- (a) Ground planting site
- (b) Container planting site

3. **How can a farmer prepare a ground planting site?**

- (a) Clear the site by removing weeds, debris, and rocks.
- (b) Plow or till the soil to loosen it and improve aeration and drainage.

4. **Describe the term soil tilth:**

Soil tilth refers to the physical condition of soil as it relates to its suitability for planting and supporting plant growth.

5. **What are the three types of soil tilth?**

- (a) Fine tilth
- (b) Medium tilth
- (c) Coarse tilth

6. **Which type of soil tilth is appropriate for the planting materials below?**

- (a) Small-sized seeds: **Fine tilth**
- (b) Medium-sized seeds: **Medium tilth**
- (c) Large planting materials: **Coarse tilth**

7. **Write three methods of planting:**

- (a) Broadcasting
- (b) Drilling
- (c) Dibbling

8. **Identify the planting materials shown below:**

- (a) Stem cuttings
- (b) Tubers
- (c) Seeds
- (d) Sucker

Selected crop management practices

Practice Assessment page 232

1. **Name two crop management practices carried out on a farm:**

- (i) Weeding
- (ii) Earthing up

2. **A grade seven student took a walk to the farm and observed the following weeds. Name the weed:**

Black jack

3. **What is a weed?**

A weed is any unwanted plant that grows in a farm or garden, competing with crops for nutrients, water, space, and sunlight.

4. **Match the following methods of weed control with their correct description:**

Method	Description
Digging out	Using jembe to remove weeds
Uprooting	Pulling out the weeds by use of hand in a field
Mulching	Applying thick layer of plant material at the base of a crop

5. **Write down four importance of crop management:**

- (a) Increases crop yield and quality
- (b) Reduces competition from weeds
- (c) Protects crops from pests and diseases
- (d) Improve growth of crops

6. **List four physical methods of controlling weeds:**

- (a) Uprooting
- (b) Digging out
- (c) Mulching
- (d) Slashing

7. **Describe the following crop management practices:**

a. Weeding: The process of removing unwanted plants (weeds) from the crop farm to reduce competition for nutrients.

b. Gapping: Filling gaps in the crop field by planting new seeds or seedlings where initial ones failed to germinate.

c. Thinning: Removing excess plants from the crop field to allow proper spacing for the remaining crops to grow.

d. Earthing up: Heaping soil around the base of crops to provide support and encourage root development.

8. **What is the importance of these crop management practices?**

a. Gapping: Ensures uniform crop coverage, improving yield.

b. Thinning: Reduces overcrowding, allowing crops to access sufficient nutrients, sunlight, and water.

c. Weeding: Minimizes competition, enhancing the growth of crops.

Preparing Animal Products (eggs and honey)

Practice assessment page 235

1. **Annelisa, a poultry farmer, wanted to grade her eggs for sale. What factors should she consider when grading?**

- (i) Shell condition (smooth, uncracked)
- (ii) Size and weight of the egg
- (iii) Internal quality, such as the appearance of the yolk and absence of blood spots.

2. **Below are features of eggs. Write good quality or poor quality against the feature below:**

- (a) Have smooth shell: **Good quality**
- (b) Have cracked shells: **Poor quality**
- (c) Have rough shell: **Poor quality**
- (d) Contains blood spots inside: **Poor quality**
- (e) Have clean shells: **Good quality**

3. **Why should honey be kept in bottles with airtight lids?**

To prevent moisture absorption, maintain its natural flavour, and stop contamination by pests.

4. **Name two materials that can be used to make containers for packing honey:**

- (i) Glass
- (ii) Plastic

5. **Highlight the steps followed when processing honey using the crushing and straining method:**

- (i) Remove the combs from the hive.
- (ii) Crush the combs to release the honey.
- (iii) Strain the crushed combs through a sieve or muslin cloth to separate the honey from the wax.

6. **Write two importance of sorting and grading eggs:**

- (i) Ensures uniformity in quality, making them more appealing to buyers.
- (ii) Helps identify and remove damaged or poor-quality eggs.

7. **Grade 7 learners were asked to mention items used in processing honey using the crushing and straining method. List some of the items mentioned:**

- (i) A clean knife or scraper for cutting combs
- (ii) A sieve or strainer for separating honey from wax
- (iii) Clean containers for collecting and storing honey

8. **State 4 factors to consider when sorting and grading eggs:**

- (i) Shell condition (smoothness and absence of cracks)
- (ii) Egg size and weight consistency
- (iii) Internal quality (absence of blood spots and freshness)
- (iv) Cleanliness of the eggshell

9. **Mention the importance of processing raw honey:**

- Ensures the removal of impurities like wax.
- Improves its appearance, making it more appealing to customers.

- Enhances shelf life by reducing moisture content and preventing fermentation.

Cooking Food (grilling, roasting and steaming)

Practice assessment page 237

1. **Describe these methods of cooking:**

- a. Grilling:** A method of cooking food directly over an open flame or heat source.
- b. Steaming:** Cooking food using the heat from steam, generated by boiling water, which helps retain nutrients and moisture in the food.
- c. Roasting:** A method of cooking food using dry heat, usually in an oven or over an open fire.

2. **Write down the procedure of grilling food of your choice:**

- Choose a food item, e.g., chicken, fish, or vegetables.
- Clean and prepare the food.
- Preheat the grill to the desired temperature.
- Place the food on the grill and cook on one side until it develops grill marks, then flip it to cook the other side.
- Serve hot once cooked.

3. **Identify the equipment in the pictures below:**

- (a) Steamer
- (b) Charcoal grill
- (c) Oven

4. **List three types of food that can be cooked through these methods:**

- a. Grilling:** Chicken, fish, corn on the cob
- b. Roasting:** Potatoes, beef, green bananas
- c. Steaming:** Cabbage, rice, kales

5. **Describe the term 'cooking food':**

Cooking food refers to the process of preparing food by applying heat to change its texture, flavour, appearance, and chemical properties, making it safe to eat and more enjoyable.

End of strand assessment page 238

- 1. Define the term soil tilth:**
Soil tilth refers to the physical condition of the soil, specifically how well it has been prepared for planting. It includes the soil's texture and structure.
- 2. Give two examples of plants that require fine tilth:**
 - a. Sunflower
 - b. Carrots
- 3. What is crop management?**
Crop management refers to the activities and practices involved in growing and maintaining crops, including planting, fertilizing, watering, weeding, and harvesting to ensure healthy growth and maximize yield.
- 4. Identify the crop management practice shown below:**
Mulching
- 5. Define the following terms as used in preparing animal products:**
 - a. Sorting:** The process of separating animal products based on quality, size, or type to ensure uniformity and meet market standards.
 - b. Grading:** The classification of animal products according to quality, size, or other characteristics to determine their value and price.
- 6. Why is it important to process raw honey?**
 - a. To remove impurities like wax, dirt, and other debris, ensuring the honey is safe and clean for consumption.
 - b. To improve its shelf life, flavor, and appearance, making it more appealing and marketable.
- 7. Good cooking allows us to enjoy a healthy meal. Name three methods of cooking:**
 - a. Grilling

- b. Steaming
- c. Roasting

- 8. Identify the method of cooking shown below:**
Steaming
- 9. Give two advantages of grilling as a method of cooking:**
 - a. It adds a unique smoky flavour to the food.
 - b. It helps to retain the natural moisture and nutrients in the food.
- 10. Wanja intends to roast meat:**
 - a. List three materials she will require:**
 - (i) Roasting pan
 - (ii) Tongs
 - (iii) Oven or open flame
 - b. Describe the procedure she will follow when roasting the meat:**
 - Preheat the oven to the required temperature for roasting.
 - Clean and prepare the meat
 - Place the meat in the roasting pan.
 - Roast the meat for the required time, turning occasionally to ensure even cooking.
 - Once completely cooked, remove and serve.

Hygiene Practices

Hygiene in rearing animals

Practice assessment page 242

- 1. List five ways a farmer can maintain hygiene on domestic animals:**
 - a. Regular cleaning of animal housing or structure
 - b. Providing clean drinking water
 - c. Regularly cleaning animal feeders and waterers
 - d. Cleaning the animals
 - e. Ensuring proper waste disposal and manure management
- 2. Explain the reasons why a farmer should carry out hygiene practices in domestic animals:**
 - To prevent the spread of diseases and infections among animals

- To improve the overall health and productivity of the animals
 - To ensure safe, healthy products (like milk, eggs, or meat) for consumption.
- List three examples of domestic animals that can be treated as pets:**
 - Dogs
 - Cats
 - Rabbits
 - Odipo rears a dog as his pet. Write how he can clean the house of the dog:**
 - Remove any waste or dirt from the dog's house regularly.
 - Sweep the floor to remove hair and dust.
 - Wash the bedding .
 - Disinfect surfaces
 - Ensure proper ventilation in the house to reduce bad smell and dampness.
 - Hygiene practices_____ practices help the animals grow healthy and prevent the spread of diseases.**

Laundry

Practice assessment page 244

- What are loose coloured garments?**
Loose coloured garments are clothing items that easily lose their colours during laundry.
- What are the reasons for care of loose coloured items when laundering?**
 - To prevent the colours from fading or bleeding onto other clothes.
 - To maintain the quality and appearance of the garments over time.
- Write the procedure of laundering loose coloured items:**
 - List materials Mary needs to use when laundering the blouse:**
 - Mild detergent
 - Cold water
 - Basin
 - Vinegar or lemon
 - Cloth or drying rack

(b) Write down the procedure she will follow when laundering the blouse:

- Sort the blouse according to colour and fabric type.
 - Fill the basin with cold water and add mild detergent.
 - Gently wash the blouse to avoid excessive rubbing or wringing.
 - Rinse the blouse thoroughly with cold water to remove detergent.
 - Add vinegar or lemon to the rinse water to help set the colour.
 - Dry the blouse by hanging it under the shade to prevent colour fading from direct sunlight.
- Grade 7 learners were asked to state the measures to be observed when laundering coloured clothes. State three measures that they stated:**
 - Wash the clothes in cold water to prevent colours from running.
 - Use a mild detergent that is gentle on the fabric.
 - Sort clothes by colour to avoid colour bleeding.
 - What is the purpose of adding vinegar or lemon when laundering loose coloured clothes?**
Vinegar or lemon helps to brighten the colour
 - Give one reason why it is recommended to dry loose coloured clothes under the shade but not in the sun:**
Drying under the shade prevents the colours from fading due to the harmful effects of direct sunlight on dyed fabrics.
 - What is the main reason for sorting clothes before laundering?**
Sorting clothes before laundering helps to prevent colour bleeding, keeps similar fabrics together, and ensures that clothes are washed in the appropriate conditions for their material.

End of strand assessment page 244

- When rearing animals, farmers are advised to maintain high hygiene standards. Give two reasons for such advice:**
 - To prevent the spread of diseases and infections among animals.
 - To ensure the animals remain healthy and productive.
- Outline three hygiene practices carried out when rearing animals:**
 - Regular cleaning and disinfection of animal housing.
 - Providing fresh and clean drinking water to animals.
 - Cleaning the animals.
- Identify the hygiene practices shown below:**
 - Cleaning the animal
 - Cleaning the animal feeders and waterer
- Why is it important to clean animal feeders?**

Cleaning animal feeders helps prevent the buildup of bacteria and mold, which could cause infections or diseases in the animals. It also ensures that animals receive clean and safe food.
- What are loose coloured clothes?**

Loose coloured clothes are garments that can easily lose their colours.
- Mention three materials that are used for laundering loose coloured clothes:**
 - Mild detergent
 - Cold water
 - Vinegar or lemon
- Amina was laundering her loose coloured clothes and used the method shown below. Name the method:**

Kneading and squeezing

- Write true or false:**
 - Loose coloured clothes should be soaked _____ (False)
 - Loose coloured clothes should not be wrung to squeeze out water _____ (True)
 - Loose coloured clothes should be hung under the sun _____ (False)
- State the procedure you can follow when laundering loose coloured clothes:**
 - Sort the clothes by colour to prevent bleeding.
 - Use cold water to wash the clothes.
 - Add mild detergent to the water.
 - Gently wash the clothes to avoid wringing or harsh scrubbing.
 - Rinse the clothes thoroughly with clean cold water.
 - Add vinegar or lemon to the final rinse to brighten the colours.
 - Dry the clothes in the shade to prevent fading from direct sunlight.
- What should be added to the final rinsing water when laundering loose coloured clothes?**

Vinegar or lemon.
Production Techniques
Knitting skills

Practice assessment page 249

- What is knitting?**

Knitting is a process of creating fabric by interlocking loops of yarn using needles to form stitches.
- Knitting can be done either by _____ or _____**

Knitting can be done either by **hand** or **machine**.
- Name four tools used in knitting:**
 - Knitting needles
 - Yarn
 - Scissors
 - Tape measure

4. **Knitting is based on two basic stitches.**

Name them:

- a. Knit stitch
- b. Purl stitch

5. **Identify the stitch shown below**

Purl stitch

6. **Name three household items that can be made using knitting:**

- a. Gloves
- b. Scarf
- c. Mat

Constructing framed suspended garden

Practice assessment page 251

1. **What is a framed suspended garden?**

A framed suspended garden is a type of gardening system where crops are grown in containers that are suspended or hung using a frame, often elevated off the ground to optimize space and promote healthy growth.

2. **State two materials that can be used to make framed suspended gardens:**

- (i) Wood
- (ii) Wire

3. **Which two crops can be established in a framed suspended garden?**

- (i) Tomatoes
- (ii) Herbs

4. **Amina wanted to construct a framed structure for a suspended garden. State three considerations she would make:**

- (i) The space available
- (ii) The type of plants to be grown
- (iii) The location and shape of the structure

5. **State two sites suitable for suspended gardens in your school:**

- (i) Along the pathways
- (ii) Fences or walls (with sufficient sunlight)

6. **Describe two management practices done on crops in container suspended gardens:**

- (i) Regular watering to keep the soil moist and provide nutrients to the plants.
- (ii) Removing weeds and controlling

Adding value to crop produce

Activity 2 page 253

- (a) Picture b
- (b) Picture a
- (c) Picture b
- (d) Picture b

Practice assessment page 253

1. **State a way that can be used to add value to the following crop produce:**

- (a) **Sweet potatoes** – Sweet potatoes can be processed into flour or crisps.
- (b) **Pumpkins** – Pumpkins can be turned into pumpkin juice or dried and ground into flour.

2. **Name two ways of value addition on crop produce:**

- (i) Drying
- (ii) Frying

3. **Identify two products obtained from value-added groundnuts:**

- (i) Groundnut butter (peanut butter)
- (ii) Groundnut oil

4. **Define the term value addition:**

Value addition refers to the process of transforming raw agricultural products into more valuable and marketable forms through various methods such as processing, packaging, or preservation.

5. **Identify and write down two reasons why value addition is done:**

- (i) To increase the shelf life of the products.
- (ii) To increase the market value and profitability of the products.

6. **What are the benefits of value addition to the farmer?**

- (i) Increased income due to higher market value.
- (ii) Reduced post-harvest losses by extending the product's shelf life.

7. **Anita wanted to use drying as a method of value addition. Which crop produce could she work on?**

Fruits such as mangoes or tomatoes for drying.

8. **Cassava can be added value through grinding. Identify another two farm products that can be ground:**

- (i) Maize
 - (ii) Pumpkin
- Making homemade soap

Extended activity

Learner to follow instructions and make homemade soap

End of strand assessment page

1. **What is a soap?**

A soap is a cleaning agent made from natural oils or fats mixed with an alkali, which is used to cleanse, wash, and remove dirt from surfaces or the body.

2. **Soap can be in two main forms. Name them:**

- a. Solid soap
- b. Liquid soap

3. **There are different forms of soap depending on the intended use. Mention four forms of soap:**

- a. Liquid
- b. Bar or cake
- c. Paste
- d. Powder

4. **Joy used the soap below to clean utensils. Identify the form of the soap she used:**

Paste

5. **Soap can be made at home using natural ingredients. Mention 4 ingredients you can use to make soap at home:**

- a. Animal fats or plant oils
- b. Ash
- c. Water
- d. Salt

6. **Outline the procedure you would use to make soap at home:**

Learner to describe

End of Term Assessments

Term 1 Assessment Exercise

1. **Define the following terms as used in soil conservation:**

a) **Soil Pollution:**

Soil pollution refers to the contamination of the soil by harmful chemicals, waste, or pollutants that affect its quality and affect plant and animal life.

b) **Soil Pollutants:**

Soil pollutants are substances that affect or reduce the quality of the soil and cause harm to plant and animal life.

2. **State four causes of soil pollution in farming:**

- a) Excessive use of chemical fertilizers
- b) Use of pesticides and herbicides
- c) Improper disposal of agricultural waste
- d) Improper disposal of plastic waste

3. **Grade 7 learners of Mukuyu school visited Isaac and observed that he had constructed terraces around the farm. What is the importance of constructing terraces on a farm?**

- Terraces help to reduce soil erosion by slowing down the flow of water.
- They reduce the force of rainwater runoff and protect the soil from degradation.

4. **State four methods of controlling soil pollution:**
- Organic farming
 - Proper waste disposal
 - Use of natural fertilizers
 - Use of correct amount of fertilizers
5. **Grade 7 learners wanted to create awareness messages against soil pollution. Write three statements they would include in their messages:**
- “Avoid using harmful chemicals in farming to protect our soil.”
 - “Recycle waste and dispose of it properly to keep our soil healthy.”
 - “Practise organic farming to reduce soil contamination.”
6. **Grade seven learners saw the following structures in Muli’s farm:**
- Name the structures:**
 - Water retention pits
 - Water retention ditch
 - What is the importance of the structures above? They help to collect and conserve surface runoff**
7. **During a lesson, grade seven learners of Tumaini school were taught the farming practices that pollute the soil. State three practices that they were taught:**
- Overuse of chemical fertilizers
 - Improper disposal of plastic waste
 - Excessive use of agricultural chemicals
8. **List three crops that can be established in water retention structures:**
- Sugarcane
 - Napier grass
 - Banana
9. **Define the term surface run-off:**
Surface run-off is the flow of excess water over the ground surface after rainfall, which does not get absorbed into the soil.
10. **Grade 7 learners intend to construct water retention ditches in their school farm. List three materials that they need:**
- Shovels
 - Pegs
 - Jembe
11. **List two ways of conserving surface run-off for gardening:**
- Constructing water retention ditches
 - Constructing earth basin
12. **Name three examples of crops that can be established to control surface run-off in gardening:**
- Napier grass
 - Sweet potatoes
 - Bananas
13. **Grade 7 learners were asked to mention two ways in which nutrients are lost when handling food. What were their response?**
- Washing food in hot water
 - Cutting vegetables before washing
14. **Write down the steps you can follow when constructing water retention ditches in the farm:**
- Select a suitable location for the ditch.
 - Dig the ditch along the contour of the land.
 - Make the ditch deep enough to collect water but shallow enough to prevent flooding.
 - Plant grass on the embankment.
15. **How can you conserve vitamins and minerals?**
- Avoid overcooking vegetables.
 - Wash vegetables before cutting.
16. **Describe one advantage of conserving vitamins and minerals in vegetables while preparing them:**
It ensures that the nutrients needed for

a balanced diet are preserved, which contributes to better health.

17. Name four management practices carried out on crops in a garden:

- a) Weeding
- b) Watering
- c) Thinning
- d) Mulching

18. Sarah, a grade seven learner was asked to list examples of crops that require coarse planting tilth. Name three examples that she probably gave as correct answers:

- a) Tubers like sweet potato
- b) Stem cuttings like cassava
- c) Suckers like banana

19. Mbugua has a small garden where she wants to plant carrots. Describe the kind of tilth she needs to prepare her garden before planting:

Fine tilth, which is soft and well-aerated to allow easy seed penetration and good root growth.

20. State three factors to consider when choosing a cooking method:

- a) Nutrient retention
- b) Time available for cooking
- c) Type of food being prepared

21. John is planning to plant tomatoes in his garden. Describe one challenge he might face if he prepares wrong tilth for his crop:

- If the tilth is too coarse, the tomato seeds might not be able to germinate properly, leading to poor crop establishment and low yields.

22. During a visit to a neighbouring farm, grade seven learners observed heaps of soil around the stems of crops. Name the management practice carried out on the crops:

- Earthing up.

23. Name four management practices carried out on crops in a garden

- (a) Watering
- (b) Weeding
- (c) Pruning
- (d) Pest and disease control

24. Sarah, a grade seven learner was asked to list examples of crops that require coarse planting tilth. Name three examples that she probably gave as correct answers.

- (a) Sugarcane
- (b) Potato
- (c) Banana

25. Learner to carry out the project

Term II Assessment

1. The substances that pollute soil are known as **Soil pollutants.**

2. Mark was advised to stop using excessive artificial fertilizers on his crops. What could be the reason for the advice?

Excessive use of artificial fertilizers can lead to soil pollution, degrade soil quality and make the soil less fertile over time.

3. List two ways of conserving surface run-off water during rainy seasons:

- a) Constructing water retention ditches
- b) Constructing water retention pits

4. Describe the following terms as used in planting:

a) Broadcasting:

Broadcasting is the method of sowing seeds by scattering them evenly over the soil surface.

b) Dibbling:

Dibbling involves planting seeds in pre-made holes or dibbles in the soil.

- c) **Drilling:**
Drilling involves sowing seeds in rows at a consistent depth using a drill or planter.
5. **Name two examples of crops with medium-sized seeds that can be planted in soil with medium tith.**
a) Beans
b) Maize
6. **Grade seven learners of Tumaini school were asked to give three examples of planting materials that can be established in coarse tith. Give three responses they gave as correct answers:**
a) Suckers
b) Tubers
c) Stem cuttings
7. **Define the following terms as used in crop management:**
a) **Earthing-up:**
Earthing-up is the practice of piling soil around the base of growing crops.

b) **Thinning:**
Thinning is the practice of removing some seedlings from a crowded area to allow others to grow better.

c) **Gapping:**
Gapping involves planting new seeds or seedlings in gaps where the original plants did not germinate or survived poorly.

d) **Weeding:**
Weeding is the process of removing unwanted plants (weeds) from a garden or field.
8. **During a lesson, learners were asked the importance of thinning. State three reasons why a farmer may carry out this practice in the garden:**
a) To reduce competition for nutrients, water, and light.
b) To allow for better air circulation and sunlight penetration.
c) To promote healthy plant growth and increase yields.
9. **The activity below is carried out during the preparation of honey:**
a) **Name the process**
Straining.

b) **What is the importance of carrying out the process?**
• It removes impurities, wax, and debris from the honey.
• It ensures that the honey is clean and safe for consumption.
10. **During camping, scouts of Makini school wanted to grill meat. State three equipment that they required to carry out this activity:**
a) Grill
b) Charcoal
c) Tongs
11. **Describe the steps followed when preparing eggs for sale:**
a. Collect fresh eggs from the poultry.
b. Sort the eggs based on size and quality.
c. Clean the eggs to remove dirt and debris.
d. Package the eggs in cartons or trays.
e. Label the eggs with the date of collection.
f. Store eggs in a cool, dry place for sale.
12. **List three methods that can be used to prepare meat for a family dinner:**
a) Grilling
b) Roasting
c) Steaming
13. **Define the term Agroforestry:**
Agroforestry is the practice of growing trees and crops together in the same land area.

- 14. During a field trip, grade 7 learners saw the structure below:
Name the water conservation structure.**
Water retention ditch
- 15. Apart from the structure above, name other three ways of conserving water in the farm:**
a) Water retention pits
b) Earth basin
- 16. James wants to prepare his garden in order to plant coriander. Describe the steps he would follow to establish the correct tilth for his crop:**
(a) Clear vegetation in the garden.
(b) Dig the garden using a jembe
(c) Loosen the soil using a rake to create a fine tilth
(d) Ensure the soil is moist but not overly wet.
(e) Plant coriander seeds evenly, at the correct depth.
- 17. Describe the process of preparing honey before selling it:**
a) Harvest honey from the hives.
b) Remove the honeycomb from the frames.
c) Extract honey using an extractor or by crushing.
d) Strain the honey to remove any wax or impurities.
e) Package and seal the honey.
f) Label the jars with relevant information for sale.
- 18. Maina, a grade 7 learner, wants to source for information from the internet on hygienic practices carried out in rearing of chickens. List two digital devices he may use to search for the information while at school:**
a) Laptop
b) Smartphone
- 19. What is the importance of ensuring good ventilation in domestic animals' structures?**
- Good ventilation helps to maintain air quality and reduce the build-up of harmful gases
 - It prevents respiratory problems in animals.
 - It helps to regulate temperature, ensuring animal comfort.
- 20. List five hygiene practices carried out in rearing domestic animals:**
a) Regular cleaning of animal shelters
b) Providing clean drinking water
c) Disinfecting feeding equipment
d) Regular cleaning of animals
e) Vaccinating animals to prevent diseases
- 21. Explain three farming practices that Kimani should carry out in his vegetable garden in order to prevent soil pollution:**
a) Use organic fertilizers instead of chemical ones.
b) Use ash to control pests.
c) Properly dispose of organic waste to avoid contamination.
- 22. Identify the method used in preparing honey:**
Crushing and straining method
- 23. List three types of foods that can be prepared by roasting:**
a) Meat
b) Maize
c) Potatoes
- 24. During a lesson, a teacher asked his learners to discuss three advantages of earthing-up to tuber crops. What was their responses?**
a) It encourages the development of tubers.
b) It helps to support the plant's stems.
c) It prevents tubers from being exposed to sunlight, thus preventing them from turning green.

25. Learner to carry out the project

1. **Grade seven learners were given loose-coloured articles each to launder during a practical lesson. Describe the procedure they followed to launder the clothes appropriately.**

- Sort the clothes according to colour.
- Fill the basin with cold water and add mild detergent.
- Gently wash the clothes to avoid excessive rubbing or wringing.
- Rinse the clothes thoroughly with cold water to remove detergent.
- Add vinegar or lemon to the rinse water to help set the colour.
- Dry the clothes by hanging it under the shade to prevent colour fading from direct sunlight.

2. **Name two examples of domestic animals kept as pets:**

- a) Dog
- b) Cat

3. **During a class discussion, grade 7 learners were asked to name examples of organic mulches. Apart from dry grass, name two other materials that can be used as mulches in a garden:**

- a) Straw
- b) Leaves

4. **List three materials used when laundering loose-coloured items:**

- a) Detergent suitable for coloured clothes
- b) Water
- c) A basin

5. **Grade seven learners were discussing different soil tilthing. Which soil tilth is most appropriate for planting small-sized seeds?**

- Fine tilth

6. **Mention four benefits of soil conservation:**

- a) Prevents soil erosion

- b) Improves soil fertility
- c) Increases water retention in the soil
- d) Enhances agricultural productivity

7. **Give four processes involved when laundering loose-colored items:**

- a) Sorting the clothes by colour
- b) Washing
- c) Drying
- d) Finishing

8. **During agriculture lesson, grade seven learners of Bidii school were taught on the importance and methods of weeding. What are some of the physical methods of weeding?**

- a) Digging out
- b) Uprooting
- c) Mulching

9. **Name three crops that require earthing-up:**

- a) Irish potatoes
- b) Sweet potatoes
- c) Cassava

10. **Name the following types of stitch:**

- (a) Knit stitch
- (b) Purl stitch

11. **Kimathi is a farmer who keeps layers. Outline the five factors that he has to consider when sorting and grading eggs:**

- a) Size
- b) Shape
- c) Cleanliness
- d) Shell condition
- e) Weight

12. **List three foods that can be prepared by steaming:**

- a) Cabbage
- b) Fish
- c) Kales

13. During a visit to her grandfather's farm, Kellen observed that her grandfather was cleaning animal waterers thoroughly. Apart from waterers, which other two areas must Kellen's grandfather maintain hygiene?
- Animal feeders
 - Animal shelters

14. Describe the process of laundering a loose-colored article for purposes of hygiene:
- Sort the clothes according to colour.
 - Fill the basin with cold water and add mild detergent.
 - Gently wash the clothes to avoid excessive rubbing or wringing.
 - Rinse the clothes thoroughly with cold water to remove detergent.
 - Add vinegar or lemon to the rinse water to help set the colour.
 - Dry the clothes by hanging it under the shade to prevent colour fading from direct sunlight.

15. Define the following terms as used in knitting:
- a) **Purl stitch:**
- A stitch that creates a textured, raised pattern.
 - It is worked from the back of the stitch.
 - It is used alternately with knit stitches in creating fabric designs.

- b) **Knit stitch:**
- A basic stitch in knitting that forms a smooth surface on the front.
 - It is worked from the front of the stitch.
 - It is one of the two basic stitches used to create fabric.

16. Mary wants to clean her kitchen using a home-made soap. List four natural ingredients that she may use to make a soap:
- Plant oil
 - Animal fats

- Ash
- Salt

17. During a lesson, a teacher discussed with her learners various forms of soap made at home. Name the various forms of soap that can be made and used at home:
- Bar soap
 - Liquid soap
 - Paste soap
 - Powder soap

18. Mwaura grows potatoes and cassava in his farm for sale. Describe the steps he would follow in order to add value to his potatoes and cassava to earn more from the sales:
- a) **Potatoes:**
- Harvest the potatoes when mature.
 - Sort and grade them based on size and quality.
 - Dry and grind them
 - Package them.

- b) **Cassava:**
- Harvest mature cassava roots.
 - Peel and clean the roots.
 - Process into flour, chips, or other processed products.
 - Package and market the processed products.

19. Use the picture below to answer questions that follow:
- a) **Name the structure above:**
- Framed suspended garden.

- b) **Mention two benefits of using the structure above:**
- It saves space.
 - It improves drainage and air circulation around the plants.

- c) **List four locally available materials that grade 7 learners may use to construct framed suspended gardens:**
- Wood

- b) Plastic pipe
- c) Pots
- d) Strings

20. During her leisure time, Anita was seen carrying out the activity below. List three household articles that Anita can make using the technique above:

- i) Tool bag
- ii) Mat
- iii) Table wiper
- iv) Gloves

21. Describe how you can knit a mat using purl stitch:

Learner to describe

22. During a farm visit to Njeru's farm, grade seven learners of Bidii school observed that he had grown lots of banana plants. What is the planting material for bananas?

- Suckers

23. Describe the best method of disposing of the following types of waste on a farm:

a) **Plastic containers:**

- Recycle the containers or dispose of them in designated waste bins.

b) **Plastic pipes:**

- Reusing to make drip irrigation.

c) **Polythene bags:**

- Recycle or dispose of in appropriate waste bins to avoid environmental pollution.

24. Grade 7 learners intend to construct framed gardens in their school farm:

a) **List three locally available materials that can be used to construct the framed suspended gardens:**

- a) Wood
- b) Nails
- c) String

b) **List three crops that can be grown in the framed suspended gardens:**

- a) Kales
- b) Tomatoes
- c) Spinach

25. Activity: With the guidance of your teacher of agriculture, source for locally available materials needed to make homemade liquid soap. Use the soap you have made to clean a knitted article.

Learner to carry out the project

PRE-TECHNICAL STUDIES

Practice Exercise 1 pg 266

1. **List three learning areas included in Pre-Technical Studies.**

- (a) Computer Science.
- (b) Business Studies
- (c) Pre-Technical.

2. **Explain why Pre-Technical Studies are important for learners.**

Pre-Technical Studies help learners develop practical skills, critical thinking and problem-solving abilities. They provide hands-on experience in technical fields, preparing students for future careers in engineering, technology and business.

3. **Match the following components of Pre-Technical Studies with their descriptions:**

Computer Science:

Learning about computer systems and programming.

Pre-Technical Studies:

Basic engineering skills and hands-on experience.

Business Studies:

Understanding business management and finance.

4. **What skills are important for a career in computer programming?**

- (a) Problem-solving skills.
- (b) Logical thinking and coding knowledge.

5. **Write True or False:**

Pre-Technical Studies help learners develop practical skills for future careers. **True**

6. **Describe one way Pre-Technical Studies can prepare learners for a career in business management.**

Pre-Technical Studies teach financial literacy, entrepreneurship and management principles, helping learners understand how businesses operate and how to make informed financial decisions.

7. **What is one role of Pre-Technical Studies?**

C) Providing hands-on experience in technical learning areas.

8. **Give an example of a task that might be done in Pre-Technical Studies related to basic engineering.**

Building a simple circuit or designing a small mechanical structure.

9. **How do Pre-Technical Studies encourage independent learning?**

They promote hands-on activities, project-based learning and problem-solving tasks allowing students to explore concepts on their own and develop self-reliance.

10. **Which of the following is NOT a benefit of studying pre-technical subjects?**

C) Learning how to avoid technological advancements.

Practice Exercise 2:

1. **Which of the following is NOT an online safety measure?**

B. Sharing personal information freely.

2. **Write True or False:**

Poorly lit rooms can be a potential safety threat. **True**

3. **Give an example of a physical safety threat in the immediate environment.**

Slippery floors that can cause falls.

4. **Match the following physical safety threats with their descriptions:**

Theft: When someone takes your belongings without permission.

Hazardous Objects: Sharp items or broken glass that can cause injuries.

Cyberbullying: Unwanted messages received online.

5. **Describe one rule to follow when using tools to ensure safety.**

Always wear protective gear and use tools for their intended purpose to prevent injuries.

6. **What are some of the protective gear that should be worn to prevent injuries in a workshop?**

- (a) Safety goggles
- (b) Gloves

7. **List two types of safety threats that can be found in the immediate environment.**

- (a) Electrical hazards
- (b) Fire hazards

8. **How can you ensure that your workspace is safe from hazards?**

Keep the workspace clean, remove clutter, and ensure proper lighting and ventilation.

9. **Explain one way to protect yourself from online safety threats.**

Avoid sharing personal information and use strong passwords to protect online accounts.

10. **What is a key benefit of wearing protective gear?**

C. It helps prevent injuries.

Practice Exercise 3

1. **Describe five characteristics of a computer.**

- (a) Speed - A computer processes data quickly.
- (b) Accuracy - It follows instructions precisely, reducing errors.
- (c) Automation - Once programmed, it works without human intervention.
- (d) Versatility - It can perform multiple tasks at the same time.
- (e) Storage - It can store large amounts of data for future use.

2. **Explain: What happens to data after it is processed?**

After processing, data is either stored in memory for future use or outputted in a useful format, such as displayed on a screen or printed on paper.

3. **Which type of computer uses binary data?**

B. Digital

4. **Write True or False:**

A computer is accurate because it follows instructions precisely. **True**

5. **Give one example of each type of computer:**

- (a) Supercomputer - **IBM Summit**
- (b) Mainframe computer - **IBM Z Series**
- (c) Minicomputer - **PDP-11**
- (d) Microcomputer - **Desktop PC or Laptop**

6. **Why is versatility an important characteristic of a computer?**

Versatility allows a computer to perform various tasks, such as word processing, calculations, and entertainment, making it useful in different fields like education, business, and research.

7. **Match the following types of computers with their examples:**

- **General Purpose:** Laptop
- **Special Purpose:** ATM Machine
- **Analog:** Seismograph
- **Digital:** Calculator

8. **A special-purpose computer can perform a wide variety of tasks.**

False (Special-purpose computers are designed for specific tasks only, such as ATMs or medical monitoring systems.)

9. **Match the type of computers with its function:**

- **Hybrid Computer:** Monitoring heart activity
- **Digital Computer:** Used for general tasks like word processing
- **Analog Computer:** Measures temperature
- **Special Purpose Computer:** Used in precise control in manufacturing

10. **What is one use of a smartphone?**

C. Taking photos

Practice Exercise 4

1. **Name three types of drawing used in technical fields.**

- (a) Technical Drawing
- (b) Architectural Drawing
- (c) Mechanical Drawing

2. **Why is drawing an important means of communication?**

Drawing visually conveys complex ideas, designs and technical details, making it easier to understand and share information accurately across different fields.

3. **Which type of drawing is used to show exactly how things are built or designed?**

B. Technical Drawing

4. **Write True or False:**

Artistic drawings are primarily used to show precise details and measurements. **False**

5. **Match the type of drawing with its example:**

Blueprints: Detailed plans for buildings.

Portraits: Pictures focusing on facial features.

Mechanical: Drawings of diagrams of machines.

Graffiti: Drawings for public spaces.

6. **Write down four types of lines used in drawing.**

- (a) Continuous thick line
- (b) Continuous thin line
- (c) Dashed line
- (d) Chain line

7. **What is the purpose of a continuous thin line in technical drawing?**

It is used for dimension lines, projection lines and leader lines to indicate measurements and reference points.

8. **What does a dashed line represent in technical drawings?**

B. Hidden or invisible edges

9. **Write True or False:**

Chain lines are used to represent visible edges in a drawing. **False** (They are used to indicate center lines, cutting planes or important boundaries.)

10. **Write what these abbreviations and symbols stand for as used in drawing:**

- (a) **DRG** - Drawing
- (b) **A / F** - Across Flats
- (c) **A / C** - Air Corners
- (d) **I / D** - Inner Diameter

Series of Squares and Rectangles:

- Use a ruler to keep the sides straight and parallel.
- Vary the sizes and orientations.
- Try overlapping some to create depth.

Series of Circles:

- Use a hand compass for perfect circles.
- Try freehand circles to improve control.
- Experiment with different sizes and spacing.

Different Types of Triangles:

- **Equilateral Triangle:** All three sides are equal.
- **Isosceles Triangle:** Two sides are equal and the base is different.
- **Right Triangle:** One angle is exactly 90 degrees.
- Use a protractor to measure angles accurately.

Objects Representing Different Lines:

- **Contour Lines:** Outline an apple or hand to show the shape.
- **Gesture Lines:** Sketch a person in motion using quick, flowing lines.
- **Implied Lines:** Draw a group of birds flying in a direction or a row of footprints leading into the distance.

Practice Exercise 5

1. **What is free-hand sketching?**

B. Drawing without tools like rulers or protractors.

2. **Which principle involves looking closely at a subject to capture its details?**

C. Observation

3. **In perspective drawing, what is used to show depth?**

Vanishing points

4. **Match the following principles of free-hand drawing with their descriptions:**

Observation: Captures shapes, proportions and details of the subject.

Proportion and Scale: Keeps both sides of an object equal with a center line.

Perspective: Uses vanishing points to show depth.

5. **Draw a simple sketch of a house using the box method.**

(Use a large rectangle as the base and add smaller rectangles for doors, windows, and the roof.)

6. **What is the purpose of the box method in free-hand sketching?**

B. To outline shapes and get the basic structure

7. **How does the center-line method help in drawing faces or symmetrical objects?**

B. By keeping both sides equal with a center-line.

8. **How do you use the hand compass method to draw a circle?**

A. Draw a circle by rotating your hand with a pencil point steady.

9. **Match the shading techniques with their purposes:**

Hatching: Create shading with parallel lines.

- **Cross-Hatching:** Add texture with lines drawn at angles.
- **Stippling:** Build up shading using tiny dots.
- **Blending:** Create smooth shading with a shading tool or your finger.

10. **Sketch 4 straight lines using free-hand techniques.**

(Practice drawing four straight lines without a ruler.)

11. **Draw a series of straight, curved and contour lines.**

(Practice drawing different types of lines to improve control.)

12. **Draw a series of squares, rectangles, and circles using the hand compass method.**

(Use the hand compass method to sketch different shapes.)

Practice Exercise 7

1. **List three ICT tools used in modern communication.**

- (a) Email.
- (b) Video Conferencing Tools (e.g., Zoom, Microsoft Teams)
- (c) Social Media Platforms (e.g., WhatsApp, Facebook, Twitter)

2. **Explain the importance of ICT tools in business communication.**

- They enable **fast and efficient communication** between employees, clients, and stakeholders.
- ICT tools support **real-time collaboration** through emails, video conferencing and messaging apps.
- They help businesses **improve customer service** and expand their reach through online platforms.

3. **Which ICT tool allows real-time face-to-face meetings over the internet?**

C) Video Conferencing Tool.

4. Write True/False:

Web conferencing tools are used for video meetings and additional features like screen sharing.

True

5. Match the ICT tool with its description:

- **Email:** Facilitates sending and receiving messages and files.
- **Mobile Phone:** Enables voice and text communication anywhere and anytime.
- **Video Conferencing Tool:** A tool for real-time face-to-face meetings.
- **Social Networking:** Allows people to share information, photos and videos.

6. Explain how using a smartphone can help in maintaining social relationships.

- Smartphones allow **instant communication** through calls, texts and messaging apps.
- They help people **stay connected** through social media and video calls.
- They provide access to **shared experiences**, such as sending pictures, videos and voice notes.

7. List two ways ICT tools make communication faster and more efficient.

- (a) Instant messaging and email allow for quick information exchange.
- (b) Video conferencing eliminates the need for physical meetings, saving time and travel costs.

8. Gmail

9. Identify the communication apps shown in the image.

X(Twitter), Facebook, Skype, Snapchat, Dribbble, Instagram, Reddit, TikTok, Pinterest, pp, Spotify, Telegram, Behance, LinkedIn, YouTube and Discord.

10. Use a computer or smartphone to:

- (i) Send an email introducing yourself and sharing one interesting fact to other learners.
- (ii) The learner to be able to set up a video call with a friend or family member using Zoom or Google Meet.

Practice Exercise 8

1. List three types of materials used in production and give one example for each.

- (i) **Metals** - Example: **Steel** (used in construction and tools)
- (ii) **Plastics** - Example: **Polyethylene** (used in packaging and bottles)
- (iii) **Wood** - Example: **Oak** (used in furniture and flooring)

2. Explain why metals are used for building structures and tools.

Metals are used for building structures and tools because they have the following properties:

Strength: Metals can support heavy loads without breaking.

Durability: They are resistant to wear and tear, lasting for a long time.

Malleability: Metals can be shaped into different forms without cracking.

Resistance to heat and corrosion: Some metals, like stainless steel, resist rust and high temperatures.

3. Match the following materials with their properties:

Plastic - Lightweight and moldable.

Wood - Natural and renewable.

Metal - Strong and durable

Ceramic - Hard and heat-resistant

4. Which of the following is a non-metallic material?

C) Glass

5. Identify and describe two materials used in making kitchen utensils.

Material 1: Stainless Steel

Examples: Spoons, forks, knives and pots

Properties: Strong, durable, rust-resistant and heat-resistant

Material 2: Plastic

- **Examples:** Cutting boards, storage containers.
- **Properties:** Lightweight, non-reactive and easy to clean.

6. Sort the following items into metallic and non-metallic materials:

Item	Material Type
Iron Sheet	Metallic
Wooden Chair	Non-Metallic
Plastic	Non-Metallic
Wire	Metallic
Glass Bottle	Non-Metallic
Copper Bottle	Metallic

7. Discuss the importance of using sustainable materials in production.

- **Recycling:** Reduces waste by reusing materials like paper, plastic and metal.
- **Upcycling:** Gives old materials a new purpose, reducing environmental impact.
- **Renewable Resources:** Using materials like bamboo and sustainably harvested wood helps protect the environment.

8. Which image below shows a material that is commonly used for making window frames?

(This requires an image, but materials like aluminum and PVC plastic are commonly used for window frames.)

9. What is the primary property of ceramics that makes them suitable for making pots and plates?

Hardness and heat resistance -

Ceramics are strong and can withstand high temperatures without breaking.

10. List and describe two sustainable practices for using materials in production.

Recycling: Collecting and processing used materials like plastic, metal and paper to create new products.

- l **Using Renewable Materials:** Choosing natural, replenishable materials such as bamboo or recycled wood to reduce environmental impact.

Practice Exercise 9

1. **List three common types of metallic materials and give one example of their use in daily life.**
 - (a) **Steel** - Used in **building construction** (bridges, buildings)
 - (b) **Aluminium** - Used in **beverage cans**
 - (c) **Copper** - Used in **electrical wiring**
2. **Explain why aluminium is preferred for making beverage cans.**

Light weight: Makes it easy to transport.
Corrosion-resistant: Prevents rust and contamination of the beverage.
Recyclable: Can be melted down and reused, reducing environmental waste.
Malleable: Easily shaped into thin sheets without breaking.
3. **Which metal is most likely to develop a green patina over time?**

B) Copper
4. **Match each metal with its typical use.**

Steel - Construction materials.
Aluminium - Beverage cans
Copper - Electrical wiring
Bronze - Sculptures and coins
5. **Write True or False:**

Steel is resistant to rust if it is not coated or treated.
False (Steel rusts when exposed to moisture unless treated or coated.)
6. **List two properties of copper that make it suitable for electrical wiring.**
 - (a) **Good conductor of electricity** - Allows electricity to flow easily.
 - (b) **Ductility** - Can be drawn into thin wires without breaking.
 - (c) **Corrosion resistance** - Does not rust easily, making it durable for wiring.

7. Which metal is known for its lightweight and is often used in aircraft?

C) Aluminium

8. Explain how the resistance to corrosion affects the choice of metal for outdoor fixtures.

- Corrosion-resistant metals like stainless steel, aluminium, and galvanized steel are chosen for outdoor use to prevent rusting and wear due to moisture, rain, and temperature changes.
- This ensures **durability** and reduces maintenance costs.

9. Match the metal with its colour.

- **Aluminium** - Silver or light gray
- **Copper** - Reddish-brown
- **Bronze** - Yellow
- **Gold** - Bronze

10. List three signs of rust or corrosion that you might observe on metallic materials.

- (a) **Reddish-brown** flakes or spots (rust on iron or steel).
- (b) **Green patina on copper** (e.g., on old copper roofs or statues)
- (c) **Surface pitting or rough texture** (caused by oxidation or rusting)

Practice Exercise 10

1. List three tools used for measuring.

- (a) Steel rule
- (b) Tape measure
- (c) Callipers

2. Which tool is commonly used to measure the thickness of materials?

B) Callipers

3. Write true or false after this statement:

A weighing balance is used to measure the length of an object.

False (A weighing balance is used to measure the weight or mass, not the length.)

4. Matching the tools below with their correct use

Tool	Use
Divider	Used for marking out circles.
Tape Measure	Used for measuring length
Try-Square	Used for ensuring right angles.
Stopwatch	Used to measure elapsed time.

5. Explain the proper care and maintenance of a steel rule.

- **Keep it clean:** Wipe off any dirt, grease, or moisture with a soft cloth to prevent rust.
- **Store it properly:** Keep the steel rule in a protective case or box to avoid bending or damage.
- **Avoid dropping:** Dropping it can cause dents or inaccuracies in measurements.
- **Use carefully:** Don't use the rule for tasks it's not designed for (e.g.hammering).

6. List two tools that are used specifically for marking out tasks.

- (a) Marking knife
- (b) Scriber

7. What is the primary use of a dot punch?

B) Marking center points for drilling

8. True or False Question:

A marking knife is used to draw lines on paper.
False (A marking knife is used to mark lines on materials like wood or metal, not paper.)

9. Describe how to use a tape measure to measure the length of a wooden board.

- **Step 1:** Place the end of the tape measure at one edge of the wooden board.
- **Step 2:** Stretch the tape measure along the length of the board, ensuring the tape is flat and straight.
- **Step 3:** Read the measurement where the tape meets the other edge of the board.
- **Step 4:** Double-check for accuracy, especially on longer boards.

10. Identify and name each of the measuring and marking tools shown below.

- A. Tape measure
- B. Dot Punch.
- C. Marking Knife.

Practice Exercise 11

1. **Differentiate between soft copy and hard copy.**

Soft copy refers to a digital version of a document or image that is stored electronically (e.g. on a computer or cloud storage). It can be viewed on devices like monitors or screens.

Hard copy refers to a physical version of a document or image, such as a printed sheet of paper. It is tangible and can be held in hand.

2. **Name two categories of printers and give one example for each.**

(a) **Inkjet printer** - Example: **HP DeskJet**

(b) **Laser printer** - Example: **Brother HL-L2300D**

3. **A _____ gives output in form of sound.**

Answer is Speaker.

Practice Exercise 12

1. **List the four main categories of computer hardware.**

Input devices (e.g., keyboard, mouse)

Output devices (e.g., monitor, printer)

Storage devices (e.g., hard drives, SSDs)

Processing devices (e.g., CPU, RAM)

2. **State one example of a voice input device.**

Microphone

3. **Explain the purpose of an output device.**

The purpose of an output device is to present or display the processed data from the computer to the user in a readable or usable form. Examples include **monitors** (visual output) and **printers** (physical output).

4. **What is the function of the Central Processing Unit (CPU)?**

The CPU is the “brain” of the computer. It performs calculations, executes instructions and processes data. It coordinates all activities within the computer by interpreting and carrying out program instructions.

5. **Describe the difference between Hard Disk Drives (HDDs) and Solid State Drives (SSDs).**

HDDs: Use spinning disks to read/write data, have larger storage capacities, but are slower and more prone to mechanical failure.

SSDs: Use flash memory to store data, which makes them faster, more durable and more energy-efficient but generally cost more per GB compared to HDDs.

6. **Which type of storage device is typically used for portable data transfer?**

B) External Hard Drive

7. **Write True or False:**

Compact discs can store more data than digital versatile discs (DVDs).

False (DVDs can store more data than CDs. A CD typically holds around 700 MB, while a DVD can hold up to 4.7 GB.)

8. **Identify one advantage and one disadvantage of fixed storage devices.**

Advantage: Larger storage capacity and generally more cost-effective than portable devices.

Disadvantage: Not portable and can be difficult to access without a computer (e.g., internal hard drives).

9. **Match the following storage devices with their description.**

Storage Device	Description
USB Flash Drive	Portable storage device
Blu-ray Disc	High-density optical disc
External HDD	Portable storage device
Memory Card	Used in cameras and phones

10. Discuss why floppy disks are no longer commonly used as a storage medium.

Floppy disks have very limited storage capacity (only around 1.44 MB), are prone to damage (due to their fragile nature), and are much slower compared to modern storage solutions like USB flash drives, SSDs, or cloud storage. Furthermore, most modern computers no longer come with floppy disk drives, making them outdated and obsolete.

Practice Exercise 13

1. Describe one way entrepreneurship benefits local infrastructure development.

Entrepreneurship can stimulate local infrastructure development by creating demand for better roads, utilities and services. As businesses grow, they often require improved infrastructure, which leads to investments in local areas, benefiting the community at large.

2. What role does social entrepreneurship play in solving social issues?

Social entrepreneurship addresses social issues by developing innovative solutions that improve the quality of life and promote sustainable development. Social entrepreneurs often create businesses that prioritize social impact, such as providing clean water, education or affordable healthcare to underserved communities.

3. Write True or False:

Social entrepreneurship focuses primarily on making a profit.

False - While profit can be a goal, social entrepreneurship emphasizes on creating social value and addressing community challenges.

4. What is one important quality of a successful entrepreneur?

A. Risk-Taking - Successful entrepreneurs are often willing to take calculated risks to pursue their business ideas and opportunities.

5. List three benefits of entrepreneurship to a community.

- (a) Job Creation.
- (b) Increased Local Economic Growth.
- (c) Improvement in Living Standards.

6. Give an example of how a business idea can come from hobbies.

A person who enjoys baking might start a bakery business. Their passion for baking could evolve into a profitable venture by offering baked goods to their community.

7. Match the following entrepreneurial qualities with their descriptions:

Quality	Description
Creativity	Ability to generate new and innovative ideas.
Risk-Taking	Willingness to start new ventures despite uncertainty.
Persistence	Continued efforts despite difficulties or delays.
Self-Confidence	Belief in one's own abilities and decisions.

8. Match the following sources of business ideas with their explanations:

Source	Explanation
Newspapers	Offers practical knowledge and skills.
Shows and Exhibitions	Showcases new products and innovations.
Existing and Potential Customers	Provides information on trends and needs.
Training and Experience	Provides information on what people need or want.

9. Which of the following is NOT a benefit of entrepreneurship?

B. Increased Business Closures - Entrepreneurship typically leads to new businesses, not closures.

10. Explain why creativity is an important quality for successful entrepreneurs.

Creativity allows entrepreneurs to develop unique ideas, solve problems and find innovative ways to meet customer needs. Creative thinking helps entrepreneurs stand out in a competitive market and adapt to changing circumstances, increasing the chances of success.

Practice Exercise 14

1. List three examples of production units and briefly describe what they produce

- (a) **Posho Mill** - Produces flour from maize for local consumption.
- (b) **Bottling Plant** - Produces bottled beverages, such as water or soft drinks.
- (c) **Clothing Factory** - Produces garments, such as shirts, trousers or dresses.

2. Explain why it is important to consider the availability of raw materials when locating a production unit.

The availability of raw materials is crucial because it ensures that the production unit can operate smoothly without delays or additional costs for transportation. It also helps in maintaining a steady supply of resources to meet production demands, reducing production downtime.

3. Match the following factors to consider when locating a production unit with their explanations:

Factor	Explanation
Cost of Land and Workers	Ensuring there is enough water and electricity.

Factor	Explanation
Safety for Everyone	Ensuring that all workers and visitors are protected.
Availability of Workers	Ensuring there are enough people to work and do the job well.
Roads and Other Ways to Move Things	Considering if there are good roads or ways to move items.

4. Write True or False:

A production unit is where raw materials are turned into finished products that can be sold to customers.

True - A production unit processes raw materials into goods for sale.

5. Describe one factor that affects the location of a posho mill.

Availability of maize - A posho mill relies on a steady supply of maize to grind into flour. It needs to be located near maize farming areas or within easy access to maize suppliers.

6. Which factor is important when locating a salon?

B. High population density - A salon should be located in areas with many people to ensure a steady customer base.

7. Match the following factors influencing the location of a production unit with their correct explanations:

Factor	Explanation
Market Demand	The high demand for milled products in the community.
Transportation	Easy access to transportation for raw materials and finished products.

Factor	Explanation
Utility Access	Reliable access to water and electricity.
Labour Availability	Availability of skilled labour for operations.

8. Explain how market demand influences the size of a production unit.

Market demand influences the size of a production unit because higher demand requires increased production capacity. If there is a greater need for a product, a larger production unit may be needed to meet the demand, often resulting in more workers, machines and space.

9. What is a key consideration when locating a cybercafe?

B. Internet access - A cybercafes primary function is to provide internet services, so having reliable and fast internet access is crucial to its success.

10. Give an example of how technology and equipment can determine the size of a production unit.

For example, a bakery may require advanced ovens, mixers and packaging machines. The number and size of these machines determine how much space is needed for the production area. As technology improves, larger or more efficient machines might reduce the required space or increase the capacity of the unit.

Practice Exercise 15

1. List the two meanings of 'goals' and 'financial goals'.

- (a) **Goals** - Desired outcomes or achievements that a person wants to reach.
- (b) **Financial Goals** - Specific targets related to money, such as saving a certain amount, investing or budgeting effectively.

2. Explain in simple terms what financial goals help you decide.

Financial goals help you decide how to manage your money, including how much to

save, how much to spend, and where to invest. They give you a plan to achieve your financial desires or needs.

3. Match the following aspects of goal setting with their descriptions:

Aspect	Description
Goal Setting	Deciding what you want to achieve and planning how to reach it.
Financial Goals	The process of deciding on specific financial targets.
Financial Goal Setting	Plans for managing and using your money.

4. What is one benefit of setting financial goals?

B. Encouraging saving and budgeting - Financial goals help you plan how much to save and how to spend within your budget.

5. Write True or False:

Setting financial goals helps in making decisions about where to spend or invest your money.

True - Financial goals guide you in prioritizing your spending and investment choices.

6. Describe one way financial goals can help in preparing for future needs.

Financial goals help by setting aside money for future needs such as education, retirement or emergencies, ensuring you're financially prepared.

7. Which of the following is NOT a factor to consider when setting financial goals?

D. Indifference - Financial goals should be specific, flexible and relevant, not indifferent or unimportant.

8. Match the following key factors for setting financial goals with their explanations:

Factor	Explanation
Measurability	Goals should be specific and clear.
Specificity	Goals should be measurable.
Relevance	Goals should align with your long-term plans and values.
Achievability	Goals should be realistic given your financial situation.

9. Explain why financial discipline is important for achieving financial goals.

Financial discipline helps you stick to your budget, avoid unnecessary spending and consistently save or invest towards your financial goals. It keeps you focused and prevents impulse spending.

10. List three key points that might be discussed about the importance of financial discipline.

- Consistency** - Regularly saving or investing as planned.
- Control** - Preventing overspending and maintaining a balanced budget.
- Focus** - Staying committed to achieving financial goals without distractions.

End of Term 1 Assessment:

1. State three components of Pre-Technical Studies.

- Business Studies, Pre-technical and Computer studies.

2. Grade 7 learners in Bidii Junior School were told to name three roles of Pre-Technical Studies in everyday life. What roles did they name?

- Developing practical skills for future careers.
- Understanding and using technology effectively.
- Improving problem-solving and critical thinking skills.

3. During a Pre-Technical Studies lesson, Learners in grade 7 were matching some pre-technical terms with their correct meaning, help them to match them correctly.

Pre-technical term	Meaning
Pre-Technical Studies	Basic skills in engineering and hands-on activities
Computer studies	Learning about technology and coding
Business education	Learning about financial management and entrepreneurship

4. The condition of being protected from or unlikely to cause danger, risk or injury.

5. (a) What safety threat was this?

- Electrical hazard
- Fire risk

(b) What safety threat could this pose?

- Electric shock
- Fire outbreak

6. State three physical potential safety threats in a work environment.

- Slip and trip hazards.
- Exposure to harmful chemicals.
- Machinery accidents.

7. Leila was requested by her Pre-Technical Studies teacher to list three online safety threats in an immediate environment. What threats did she likely list?

- (a) Phishing attacks.
- (b) Identity theft.
- (c) Cyberbullying.

8. Complete the following sentences by filling in with the right online safety threat being described:

- (i) Illegally accessing someone's computer or online accounts to steal information or cause damage: **Hacking**
- (ii) Sending mean or hurtful messages to someone over the internet: **Cyberbullying**
- (iii) A type of malware that locks your computer or files and demands money to unlock them: **Ransomware**

9. Write three ways of observing Safety in the Immediate Environment.

- (a) Follow all safety guidelines
- (b) Wear appropriate safety gear
- (c) Report any unsafe conditions or practices.

10. Pair each of the following subjects with its correct description.

Subject	Description
Computer Science	Studying technology and coding techniques.
Pre-Technical Studies	Developing practical engineering skill.
Business Studies	Learning about financial management and entrepreneurship.

11. Name each of the following examples of computers.

- (a) Desktop computer
- (b) Laptop computer
- (c) Smartphone

12. State the meaning of the following terms:

- (a) **Computer** - A device used for processing and storing data, and executing tasks.
- (b) **Data** - Raw facts and figures that are processed to form information.
- (c) **Information** - Processed data that is meaningful and useful.

13. Name three criteria used to classify computers.

- (a) Size
- (b) Purpose
- (c) Processing power

14. Arrange the following computers from the largest to smallest:

- (i) Supercomputers
- (ii) Mainframe computers
- (iii) Minicomputers
- (iv) Microcomputers

15. State one characteristic of a computer.

It can process large amounts of data quickly.

Here are the answers for End of Term 11 Assessment:

1. **What is Pre-Technical Studies?**

Pre-Technical Studies is a subject that introduces learners to basic technological concepts, skills, and practices used in various fields such as engineering, design, and technology. It helps develop practical abilities through hands-on activities.

2. **Outline three roles of Pre-Technical Studies in day-to-day life.**

- (a) Develops problem-solving skills.
- (b) Prepares students for future careers in technology and engineering.
- (c) Teaches practical skills that can be applied in everyday tasks.

3. Name each of the following types of computers below.

- (a) Mainframe computer
- (b) Desktop computer
- (c) Laptop computer
- (d) Smartphone

4. Match the following types of computers with their examples.

Type of Computer	Examples
General Purpose computer	Laptop
Special Purpose computer	ATM Machine
Analog computer	Speedometer
Digital computer	Smartphone

5. State one difference between the term data and information as used in computer.

Data is raw facts and figures, while **information** is processed and organized data that is meaningful.

6. Explain the following characteristics of a computer:

- (i) **Speed** - Computers can process and perform tasks at a very fast rate.
- (ii) **Versatility** - Computers can be used for a wide variety of tasks across different fields.
- (iii) **Consistency** - Computers perform tasks accurately and without errors consistently.
- (iv) **Diligence** - Computers can work continuously without fatigue.

7. Draw a circle of radius 7cm. Inside the circle, draw a chain line to divide it into two equal parts.

(Unfortunately, as an AI, I cannot physically draw, but the solution involves drawing a circle with a compass, and then using a straight edge or chain line to divide it into two equal parts.)

8. Jackson, a grade 7 learner, was told by his Pre-Technical Studies facilitator to search for the meaning of the following terms during a lesson on 'Online Safety Threats'. Help him to write the meaning of each term:

- (a) **Cyberbullying** - The use of electronic communication to bully someone, often by sending hurtful messages or threats.
- (b) **Phishing** - A method used by cybercriminals to trick people into providing sensitive information, such as passwords or credit card details.
- (c) **Hacking** - The act of gaining unauthorized access to a computer system or network.
- (d) **Malware** - Malicious software designed to harm or exploit a computer system.

9. State three ways of observing safety in the immediate environment.

- (a) Follow safety guidelines and procedures.
- (b) Wear appropriate safety gear.
- (c) Ensure that hazardous materials are properly labeled and stored.

10. Match the following ways of how to keep personal and sensitive data secure when online with the correct description.

Ways of keeping Personal and Sensitive Data Secure	Description
Strong Passwords	Combine letters, numbers, and special characters. Avoid using easily accessible information like birthdays or names.
Two-Factor Authentication	Add an extra layer of security to your accounts by requiring a second form of identification, such as a code sent to your phone.
Phishing Scams	Avoid clicking on suspicious links or sharing personal information in response to unwanted emails or messages.

11. How can you ensure that your workspace is safe from hazards?

- (a) Ensure all equipment is maintained and safe to use
- (b) Keep the workspace clean and free of obstacles

12. Learners in Grade 7 were studying safety measures for the immediate work environment. They observed a man wearing the safety equipment shown below. State one safety measure that this equipment helps to protect us from.

This equipment helps protect us from injuries related to falling objects or machinery.

(Safety gear such as helmets, gloves, etc., protects workers from various hazards.)

13. State one difference between artistic drawing and technical drawing.

Artistic drawing focuses on creativity and personal expression, while **technical drawing** is precise and used for communication in engineering, architecture, and design.

14. Use a pencil and a plain paper only to sketch the following 8 straight lines. Do not use a ruler or any straight edge.

(As an AI, I can't perform drawing tasks, but this is a skill exercise that requires drawing straight lines freehand.)

15. In your Grade 7 Pre-Technical Studies, you have been learning about different techniques used to create depth and texture in drawings. Shading is one of the essential skills artists use to make their drawings look more realistic. Can you list two different shading techniques that can be used to add dimension and detail to your artwork?

- (a) Hatching
- (b) Cross-hatching

16. What do the following symbols and abbreviations stand for as used in drawing?

- DRG - Drawing
- A/F - As Found
- A/C - As Constructed
- I/D - Inside Diameter

17. List two ICT tools used in communication.

- (a) Email
- (b) Video conferencing software (e.g., Zoom)

18. George, a manager at a company, wants to hold an online meeting with his employees who are located in different regions. Which application can he use to effectively communicate face-to-face with his employees?

Zoom

Here are the answers for End of Term III Assessment:

1. During a lesson on Safety in the immediate environment, grade 7 learners came across the word hazard. What does it mean?

A hazard is any source of potential harm, danger, or risk that could cause injury, damage, or loss in the environment.

2. Economic resources can be categorized into three main classes, name them:

- (a) Land (b) Labor (c) Capital

3. What is the meaning of a computer?

A computer is an electronic device that processes data, performs calculations, and executes instructions to carry out tasks such as storing, retrieving, and displaying information.

4. State one difference between technical and artistic drawing.

Technical drawing is precise and used for creating plans and designs in fields like engineering and architecture, while **artistic drawing** is more creative and focuses on personal expression.

5. The following are the steps of shutting down a computer but not in correct order. Arrange them correctly:

- (i) Click Start menu.
- (ii) Save your work and close applications
- (iii) Click "Shut Down"

6. Which ICT tool of communication is represented by the icon shown below?

Email

7. Match the following injuries that can occur in a work environment with their correct causes.

INJURY	CAUSE
Burns	Fire or hot things
Scalds	Hot liquids
Cuts	Sharp objects

8. Which material is likely to have the following two characteristics?

- (i) It is attracted by a magnet
- (ii) It is very hard
- (iii) It is a good conductor of electricity
- (iv) It rusts when exposed to moisture

Answer: Iron or steel (Materials like iron fit these characteristics.)

9. Explain the meaning of diligence as used in defining characteristics of a computer.

Diligence refers to the computer's ability to work continuously without getting tired or making mistakes, always performing tasks with care and attention.

10. In technical drawings, various types of lines are used to represent different features of an object. Identify the type of line shown in the circle below.

- Continuous line (for visible edges)
- Dashed line (for hidden edges)

11. Leila, a grade 7 learner, asked her friend to give her some business ideas in order to start a business. Name any two business ideas Leila was given.

- (a) Selling food and beverages.
- (b) Selling clothes and accessories.

12. Name any two security features found in the Kenya sh1000 shilling note.

- (a) Watermark of the Kenyan President.
- (b) Security thread that changes colour.

13. State the three categories used to classify computers.

- (a) Analog computers
- (b) Digital computers
- (c) Hybrid computers

14. In technical drawing, what do the following abbreviations stand for?

- (i) O/C - On Center
- (ii) DRG - Drawing
- (iii) A/C - As Constructed

15. State two characteristics of capital as a factor of production.

- (a) Capital can be used to produce goods and services.
- (b) Capital is a man-made resource that requires investment.

16. Name the following tools used in a work environment:

- (a) Hammer
- (b) Wrench
- (c) Screwdriver

17. State three visual programming language applications.

- (a) Scratch
- (b) Blockly
- (c) App Inventor

18. Name the following fixed storage devices:

- (a) Hard Disk Drive (HDD)
- (b) Solid State Drive (SSD)
- (c) Optical Disk (CD, DVD)

19. Identify and name the following parts of scratch labelled A, B, and C:

(Unfortunately, I cannot see the image, but typical Scratch parts might include:

- (a) Block Palette
- (b) Scripts Area
- (c) Stage

20. State three differences between metallic and non-metallic materials:

- (a) Metals are good conductors of electricity, while non-metals are poor conductors.
- (b) Metals are usually shiny, whereas non-metals are dull.
- (c) Metals are generally harder and stronger, while non-metals are more brittle.

21. List two roles of entrepreneurship in a community.

- (a) Creation of job opportunities.
- (b) Improvement of community services and infrastructure.

22. What is a financial goal as used in entrepreneurship?

A financial goal in entrepreneurship is a specific target set by a business to manage, grow, and allocate financial resources, ensuring sustainability and profitability.

CREATIVE ARTS AND SPORTS

1.0 Foundations of Creative Arts and Sports

1.1 Introduction to Creative Arts and Sports

Activity 1

- Learner to list some activities he or she does for fun like swimming, playing football, singing
- Learner to list things that he or she likes watching like sports, movies
- Learner to list some sports like football, handball, athletics.

Activity 2

- Learner to collect various pictures inspired by Creative Arts and Sports, paste the pictures on a surface to make a collage then take a photograph of the collage
- The photo of the collage is to be pasted on the first page of Creative arts and sports book.

Assessment 1

1. **a) Visual Arts** - Forms that are appreciated through the use of eyes.
b) Music and dance - Music is the creative composition of songs while dance is the rhythmic movement of the body.
c) Drama and film - drama is the live performance of actions while film is the recorded performance of actions whereby actors pre-record the actions.
d) Sports - these are physical activities that aim at promoting an individual's fitness and coordination.
2. The audience are the people who watch, cheer and appreciate the categories of Creative Arts and Sports
3. A creative artwork made by collecting and pasting different materials onto a surface to create an artistic composition.
4.
 - Old newspapers
 - Old magazines
 - Printed pictures

5. By combining materials like paper, fabric, paint and pictures

1.2 Components of Creative Arts and Sports

Activity 3

- Learner to listen to a narrative from an elderly person and then answer the questions appropriately.

Activity 4

- (i)
 - Jogging
 - Aerobics
 - Press-ups
 - Frog jump
- (ii)
 - Strengthens muscles
 - Improves blood circulation
 - Lowers the risk of injuries
 - Improves one endurance

Activity 5

1. Learner to look at the pictures
2.
 - Ladder drill
 - Balancing on a beam
 - Juggling
 - Dribbling through cones
 - Jumping
3.
 - Ladder drills help improve coordination by enhancing footwork timing and muscular control.
 - Balancing on a beam helps improve coordination by training the brain and body to work together.
 - Juggling improves coordination synchronizing the hand and the eyes
 - Dribbling through cones helps improve coordination by incorporating footwork and body control.
 - Jumping helps improve coordination by enhancing the connection between the brain and muscles

Activity 6

1. Learner to look at the pictures
2. - squating
- Deadlift
- Push ups
- Pull-ups
3. - Squating helps in strengthening lower muscles
- Deadlifts help in strengthening all the body muscles
- Push-ups is a body weight exercise that improves strength in multiple muscle groups
- Pull-ups strengthen multiple muscle groups especially in the upper body.

Activity 7

- Learners to listen to each other as they speak then answer the questions appropriately

Activity 8



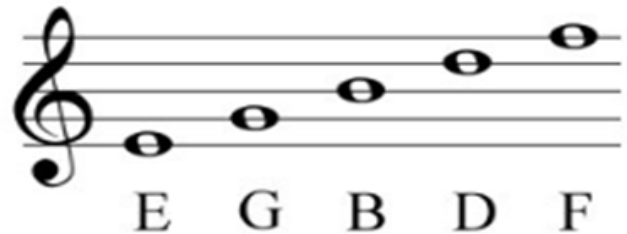
Activity 9

- Learner to watch videos and films on how components of Creative Arts and Sports relate to each other and write down short notes.

Assessment 2

1. - Visual Arts
- Music and dance
- Drama and film
- sports
2. This is whereby there are two crotchet beats in a bar.
3. The highness or lowness of musical sound

4. It is a musical staff that consists of five horizontal lines and four corresponding spaces
5. These short lines that extend above or below the treble staff to notate pitches that are outside the staff's normal range.
6. F A C E
- 7.



8. Semibreve - 4 beats
9. This is the order of events in a story
10. This is the ability of a person's muscles to exert force against an object or to overcome resistance.

2.0 Creating and Performing Creative Arts and Sports

2.1 Drawing and painting

Activity 1

1. Learner to give a yes or no answer
2. - Pencil
- Charrcoal
- Chalk
- Crayons
- Coloured pencils
3. - Balance
- Tone
- Shape
- Value
- Space

Activity 2

- Learner to search for other types of lines from a digital device and note them down.

Activity 3

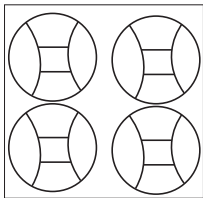
- Balance has been achieved by distributing the drawing equally in the available space.

Activity 4

- Learner to suggest answers to the given questions.

Assessment 3

1. - Charcoal;
- Coloured chalk
- Crayon
- Coloured pencil
- Pencil
2. These are colours that show calmness
3. - Red
- Orange
- Yellow
4. When both sides of the drawing have equal components therefore they mirror each other
5. By crisscross the lines using cross hatching technique



7. Warm colours - red, orange, yellow
8. Blending
9. Using dark colour


2.2 Rhythm

Assessment 4

1. - Identify strong and weak beats
- In $\frac{2}{4}$ time signature, there are four crotchet beats in every bar
- Notes should not be beamed across the bar line
2. - Check and identify the time signature
- Identify the note values and rests used and their durations

- Break down the longer patterns into smaller portions that are manageable

3. $\frac{2}{4}$ time in rhythm means that these are two beats per measure and the quarter note gets one beat.

4. 

2.3 Javeline and Sculpture

Activity 5

- (a) Javelin throw
- (b) Javelin
- (c) By throwing the javelin to the longest distance possible
- (d) Learner to give names of Kenyan athletes who participate in javelin throw

Activity 6

- Learner to watch video clips and pictures of the javelin sector.

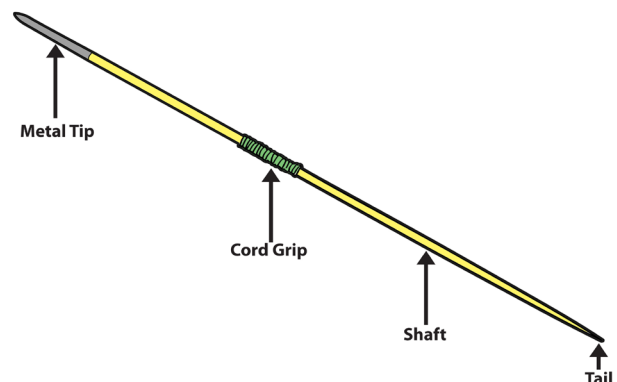
Activity 7

- Learner to use digital devices to check pictures of a javelin and observe its parts.

Assessment 5

1. It is a sculpting technique that involves removing material from a solid block to create a three dimensional form.

2.



3. Julius Yego

4. - Carry
- Approach run
- Cross over
- Release
- Follow through
5. - Sanding
- Texturing
- Smoking
- Painting

2.4 Melody

Activity 8

1. Learner to sing a song with classmates
2. It should have qualities of a good melody like
 - It should be singable with leaps of a 3rd
 - It should have identifiable shape or contour
 - It should have symmetry
 - It should start on d, m or s and ends on d.

Activity 9



Assessment 6

1. - Singable with leaps of a 3rd
- Identifiable shape or contour
- Symmetry
- Starts on d, m or s and ends on d
2. - It is the first and most important note of a scale
- It builds the foundation of the melody by giving a strong start
3. - Draw the graphic outline of the shape of your melody
- Divide the graphic outline into four parts
- Write the scale and key signature

- Prepare the staff with a G-clef
- Add rhythm
- Ensure a smooth rhythm

4. Learner to compare many four bar melodies in C-major and perform them using the descant recorder.

2.5 Handball

Activity 10

- Learner to practice jump pass, side pass and flick pass in handball.

Activity 11

- Learner to watch a video clip on high and low dribbling in handball.

Assessment 7

1. - Jump pass
- Side pass
- Flick pass
2. Low dribbling
3. Jump pass

2.6 Descant Recorder

Activity 12

- Learner to get a music notation book with melodies on staff and carry out the given activities.

Assessment 8

1. It is a Western wind instrument
2. - Use the left thumb to cover the back hole
- Cover all the holes
- Support the recorder using the right hand thumb
- Blow gently to produce the note of C
3. - Blowing
- TONGUING
- FINGERING
- PHRASING
- BREATH CONTROL
- posture

4. - Improves a person's music skills of creating and performing
- Enhances a person's listening skills
- It is a form of enjoying music
- Helps in ensemble settings
5. They make music interesting

2.7 Storytelling and animation

Activity 13

- Learner to narrate a story before his or her classmates

Activity 14

- Door - Transition, passage, escape, discovery
- Pen - Authority, communication, education, knowledge
- Fire - destruction, danger, purification, life
- Key - Success, power, access, knowledge

Assessment 9

1. It is a booklet of a sequence of images of still objects that change slowly and gradually from one page to the next.
2. - Pocket book or paper
 - Pencil
 - Ruler
 - Crayon
 - Paint brush
 - Sharp cutting tools like scissors
3. - Subject matter in animation is the main theme, topic or focus of the animation.
4. - Spacing
 - Key frames
 - Consistency in size
 - Overlap
 - Timing

Assessment 10

1. - I will choose a relatable story whose themes address pertinent and contemporary issues affecting the audience.
 - I will employ the use of costumes and props that would enhance message delivery in an interesting manner.
 - I will vary my voice in different tones, pitches, and volumes to mimic different characters and convey emotions.
 - I will use non-verbal cues such as facial expressions and gestures to emphasize on key moments and issues.
 - I will use visual illustrations and real-life examples to enhance understanding of the message I will be conveying.
 - I will engage the audience by; asking questions, giving them an opportunity to ask questions, welcome their thoughts and contributions to the theme I am addressing.
 - I will use interesting and well known songs to keep the audience alert and entertained.
2. **Beginning:** where the characters and the key incident are presented to the audience.
Middle: where characters interact to build up the story and face conflicts up to the climax.
End: in falling action the characters try to solve their conflicts and reach in a conclusion at the end of the story.
3.
 - microphones
 - smartphones, tablets, or computers
 - camera
4. It is a booklet that contains a sequence of images of still objects that change slowly and gradually from one page to the next.
5. -Papers
 - Pencils
 - Ruler
 - Crayons
 - Stapler/ paper camp / needle and string for binding
 - Scissors

6.

- To build and boost the confidence that is required during performance.
- Rehearsing enables the performer to familiarize with the content and become flowless when performing.
- To experiment with tone, pitch, gestures, and facial expressions, which can enhance message delivery and emotional engagement thus make storytelling more entertaining.
- Helps in timing and pacing that is essential during performance.
- Helps the performer to be familiar with the storyline and memorize it properly.
- Helps in preparing props, visual aids and costumes and practicing on how to use them seamlessly.
- Practicing in the performance space helps refining on stage movements and stage management during performance.

Assessment 11

1. Chest trap.
2. Dribbling is a skill in football whereby a player moves with the ball making shot kicks while controlling it to evade opponents and create opportunities for their team.
3. The low drive shot is intended at scoring a goal while keeping the ball close to the ground. While the placed shot is used when the player aims at high sections of the goal where the is less likely to reach.
4. Steps of improvising
 - Melting the wax
 - Adding pigment
 - Pouring in the moulds
 - Cooling
 - Cutting to size.
5. Team effort refers entails the collaborative work of a group of individuals (teammates) who combine efforts, and skills, to achieve a common goal.

Assessment 12

1. Choral folk song
2. Varied answers depending on the community of the learner.
3. Projection and balance of the performers' voices
 - Phrasing by taking pauses after groups pf notes in the melodies of the folk songs.
 - Tempo; the speed of the songs beats as heard from the singers voices and musical instruments used.
 - The tone quality of the voices of the singers.
 - Dynamics; softness or loudness of the voices of the performers and the musical instruments used.
 - The expression of the performers and interpretation drawn by the audience.
 - The gestures and dance movements used to emphasis on the message being passed across.
 - The intensity and strength of the performance.
 - Mood: the atmosphere created around the audience after listening to folk songs.
 - idiom/authenticity; the relevance of the folk song to the occasion of performance.
4.
 - Folk songs help in preserving and transmitting cultural heritage and values.
 - They retell the history, traditions, and languages of communities in Kenya.
 - Folk songs convey stories, moral lessons, and historical accounts thus educate the people in the community
 - Folk songs promote community unity and bonding through participation in singing, dancing and watching.
 - Are a form of entertainment during community gatherings, ceremonies and national holidays.
 - The sacred folk songs help in seeking God's intervention and presence in the communities, therefore they are prayers.

- Performance of folk songs is a means of earning income for the performers.
 - Folk songs attract tourists thus promote the foreign exchange sector by providing the government income.
5. -Birth and naming folk songs
 -Worship folk songs
 -Marriage folk songs
 -Work folk songs
 -Funeral folk songs
 -Initiation folk songs

Assessment 13

1. How to make a Kenyan themed bracelet using the one-way technique.

Step 1: using a fishing line, start a row of four black beads.

Step 2: add two white beads.

Step 3: add four red beads.

Step 4: add two white beads.

Step 5: add four green beads.

Step 6: repeat the steps above starting from the first one.

Step 7: once you achieve the desired length, secure the ends by using a tight knot and trim them.
2.
 - Among the Samburu people, beaded necklaces are known as mporo and each colour bead signifies different meanings; **Green:** is the colour of the earth; nourisher of cattle, Lighter green: Safeguards the pregnancy of female holders, White: the colour of milk, signifies new life, Bright blue: source of energy, Dark blue: symbolises Enkai (God)
 - Among the Maasai community, beads jewellery are used to indicate age, gender, social status, and to mark important life events such as weddings and initiation.
 - Cultural identity and heritage; Different communities in Kenya have unique jewellery styles that are used to identify them from others by carrying cultural symbols that

- convey cultural values, beliefs, and historical narratives of the community.
 - Social Status and Wealth; In different communities, the type and amount of jewellery worn by individuals is used to indicate a person's wealth. Women's jewellery indicate their husbands' or fathers' wealth.
 - Leadership-some traditional jewellery is used to indicate leadership status and it is worn by chieftains, elders or kings.
 - Marital status; In communities such as the Abagusii, women were given anklets (ebitinge) by their husbands to indicate that they are married. The Turkana women wear beaded jewellery around their necks to indicate that they are married.
 - Used for beauty purposes
 - To mark initiation rites; among the Tharaka community a leg bell which was worn during the initiation ceremonies of warriors
 - To indicate fertility among women; among the chuka women, cowrie shells indicated that they are fertile and ready to bear children.
3. -Performance techniques applied when performing patriotic songs
 - Proper diction; Pronounce the words clearly and appropriately.
 - Apply proper dynamics, tone and pitch that are attributed to the patriotic song.
 - Use appropriate facial expressions that help in emphasising on the message of the song.
 - Use appropriate and allowed body language; when performing national anthems observe the body etiquette approved. Minimise unnecessary body movements.
 - Perform in platforms that allow and respect the patriot song that you want to perform.
 4. Patriotic songs are musical compositions that express love, pride, loyalty, and devotion to one's country. These songs are used to celebrate national identity, history, values, and achievements, and they unite people by fostering a sense of collective national pride.

5. During public events like public holiday celebrations, sports events, or civic ceremonies such as swearing in ceremonies.
6. -Singing the national anthem.
-Writing and performing patriotic songs.
-Celebrating national heroes and events through music.
- Making beads and jewellery

Assessment 14

1. Crouch dive
2. - Start by standing at the edge of the pool with your feet together and arms at your sides
 - Take a deep breath to fill the lungs.
 - Jump with your feet together and toes pointed down
 - Maintain this position once in the water
3. Body alignment in backstroke.
 - The body lies horizontal in the water, with minimal vertical movement, the body should be straight from head to toe.
 - The head is kept head in a neutral position, with the face above the water and your eyes looking straight up.
 - The body takes a supine position; lies while facing the sky.
4.
 - To breath while in the supine position;
 - Rotate with a sight raise of the head to inhale.
 - Lower the head and exhale continuously while underwater.
 - Take enough breath to last a stroke or two before taking another.
5. A flutter kick is a swimming technique that involves moving the legs in a rhythmic, alternating up-and-down motion to push the swimmer forward.
 - The legs are extended straight back, then moved up and down in a kicking motion.
 - The knees are slightly bent to allow for a snapping action at the end of the toes.

- The toes are pointed to minimize drag.
- The kick is initiated from the hips

Assessment 15

1. Rope games are the fun activities whereby participants use ropes to skip as high and as many times as possible.
2. Varied answers for example:
Mnyoo (Caterpillar)
 - A single rope is used, with two players turning it.
 - The jumper starts by jumping with one-foot slowly and gradually adds more steps, resembling a caterpillar's movement.
 - Towards the end of the sequence the jumper should emulate the motion of the caterpillars on the ground by lying and using arms and feet to lift the body up quickly.
 - When playing this game, the players count number from one to the highest while keeping rhythm with the skipping speed.

Objective:

 - To complete a t sequence of jumps without tripping on the rope.

Rules

 - The jumper begins with simple single leg jumps and increases the complexity by adding more steps and alternating feet.
 - Player can show mastery by jumping in a zigzag patterns very quickly.
3. Varied answers for example:
Mama Njeri
Others: Mama Njeri?
One in the middle: Eh
Others: Unaenda wapi?
One in the middle: Sokoni
Others: Kununua nini?
One in the middle: samaki
Others: Mboga gani?
One in the middle: ombuta
Others: Haya kwaheri salimia watoto nyumbani. Lakini nilisikia bwana yako aliumwa na nyoka!

One in the middle: auuwii! Nifanye nini? Sina mwingine! Wa kunipenda! Kama peremende!

All:(player in the middle emulates frog jumps as they sing this part) Sijamkuku kuku sijampata moja

Sijamkuku kuku sijampata mbili...tatu....
nne....tano....sita....saba...nane...tisa...

Sijamkuku kuku sijampata kumi

4. - Rope games teaches players coordination, rhythm, and teamwork.
- Helps in improving agility, balance, and endurance of the players.
- Engaging in these games helps build strength, endurance, and flexibility.
5. - When a jumper steps on the rope.
- When a jumpers trips over while playing.
- If the jumper does not jump high enough to clear the rope and the rope hits their body; their feet, legs, or body.
- In games where there is a specific rhythm or pattern by jumping in time with a moving rope, incorrect timing for instance jumping too early or too late, or missing a beat can result in elimination.
- If there are certain rules for how the jumper should move for example hopping on one foot, jumping in a specific pattern, or jumping backward, breaking the pattern or jumping incorrectly can result in elimination.

3.0 Appreciation in Creative Arts and Sports

Assessment 16

1. - **Fairness:** Sports encourage fair play where there are rules that ensure that all participants have a chance to play on a level playing field. Fairness encourages trust and integrity in when playing.
- **Teambuilding:** Sports encourage collaboration, communication and teamwork among team members. Team building builds the spirit of unity, thus helps players to work together to achieve a common goal.

- **Equality:** players from different social backgrounds, ages, gender, and races have equal chances of participating. The participants are given equal treatment and when they win, they receive uniform awards.
2. Mood
 - The mood is how the folk songs are performed to influence the emotional response of the audience.
 - The mood of a folk song is directly tied to its lyrics, melody, and performance style.
 - It can evoke various emotions such as joy, sorrow, nostalgia, or celebration.
 - The singing style, tempo, and dynamics contribute to the mood, with faster tempos often creating a lively atmosphere, while slower tempos may evoke a more sombre or reflective mood.
3. -Theme
 - Plot
 - Confidence of the performers'
 - Use of voice
 - Use of props
 - Audience involvement
 - Time management
4. Folder that holds a collection of a learner's work that is used to showcase their abilities.
5. Roles of analysis in creative arts and sports
 - Creates a deeper understanding and interpretation. When analysing categories of Creative Arts and Sports, one can gain a richer understanding of the strategies, skills and intentions of the participants.
 - Analysis offer critique that lead to improvement of the performers by focusing on the feedback from peers and critics.
 - Constructive analysis helps refine the skills of performers and push their creative boundaries.
 - Creates understanding of different cultural heritage.
 - In sports, analysis help in enhancing performance when the coaches and players focus on the analysis to help them in training

strategies, tactical adjustments, and skill development.

- Analysis encourages creativity, enlightens decision-making, and contributes to overall excellence in performance.

END OF TERM I ASSESSMENT I

1. **Visual arts:** Painting, Drawing, Sculpture, Photography, Creation of montage and collage, Displaying and appreciation of visual arts.

Sports : Athletics , Ball games , Gymnastics swimming, Indigenous games , Inter-school/ inter-class sports competitions, and Physical exercises.

Drama and film: Acting, Watching, Recording , Casting , Engaging in drama festivals.

Music and dance: Singing of folk songs, country music, religious music and taarab music, Dancing; folk dances, tap dances, cultural creative dance, contemporary dance and modern dance, and Engaging in music festivals.

2. The audience entails the people who watch, cheer and appreciate the categories of creative arts and sports.

3. **Mixed Media:** Combine materials such as paper, fabric, paint, and found objects to add depth to the collage.

Layering: layer images and materials to show the relationship between the categories of creative arts and sports.

4. -By Using layering techniques
Incorporating different textures and materials.
-Using colours and contrasts to guide the viewer's eye through the composition.
5. **Teamwork:** The ability to work collaboratively with others towards a common goal.
6. **The protagonist:** main character around whom the story revolves and who does most



of the action.

Supporting characters: the other people or animals who interact with the main character positively or negatively to build up the story.

Antagonist: the rival to the main character. They oppose the main character and build up conflict and tension in story.

7. Physical Fitness is a person's ability to perform daily tasks and physical activities with ease without straining or hurting

8.

Name	Symbol	Rest
Minim		

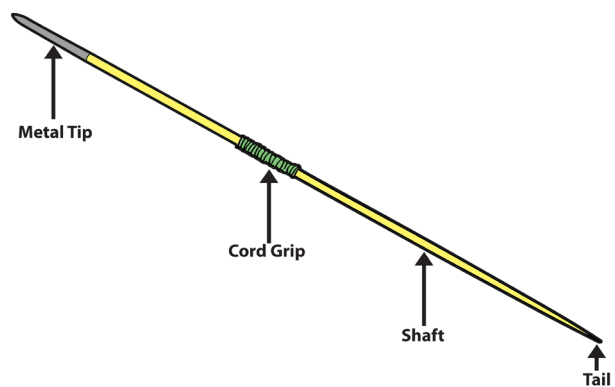
9. Jump pass

10. Handball

11. In $\frac{2}{4}$ time, there are two crotchet beats in a bar.

12. Cross-hatching, Stippling, Shading, and Smudging.

13.



14. singable with leaps of a 3rd.
Has identifiable shape/contour.

Has symmetry.

Starts on d, m or s.

Ends on d to show finality.

15. Jump pass

16. **Tonguing:** this is the placing of the tongue against the base of the upper teeth when starting a note to produce a "tu/ du".

Fingering: the opening and closing of finger holes using the correct fingers to produce well-articulated notes.

Posture: for accurate production of notes; play while sitting or standing upright with the back and head straight, neck and relaxed shoulders while holding the descant recorder properly.

Blowing: this is the gentle passing of air into the blowing hole using the mouth to produce sound.

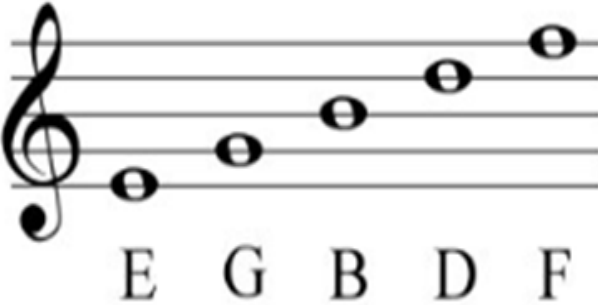
Breath control: when playing the descant recorder use consistent breath speed to produce uniform tones.

Phrasing: involves taking breaths in between notes at the right time.

END OF TERM I ASSESSMENT II

1. Visual arts
Music and dance
Drama and film
Sports
2. - Glue sticks
- Double sided tape
- Office glue
3. Strength refers to the ability of a person's muscles to exert force against an object or to overcome resistance.

4.



5. $\frac{1}{2}$ a beat
6. A period of silence in music.
7. Varied answers. Example:



8. This is the location, time and period when the action in a story takes place from the beginning to the end. It can be: a Geographical area, Historical time, and a Period or era or generation.

9.

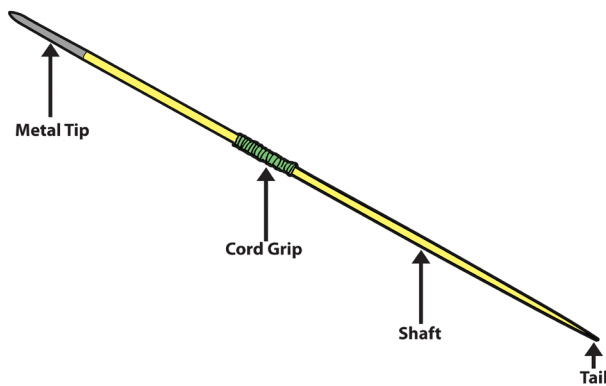


10. - Pencils
- Charcoal
- Chalk
- Crayons
- Coloured pencils
11. Tone is the darkness or lightness of colour or shade in a drawing.
12.
 - Cross-hatching
 - Stippling
 - Shading
 - Smudging
13. Cool colours are the hues that evoke a sense of calm, relaxation, and coolness and are associated with cool or cold elements in nature, such as water, sky, and plants.
14. A time signature is a musical notation that tells indicates the number of beats in each measure and what type of note gets one beat.
15. - Time signature,
- Repetition of note values and rests,
- Variation of note values and rests
16. Ta-te

17. Javelin throw.

- 18. -sanding
- texturing
- smoking

19.



20. - Singable with leaps of a 3rd: A good melody is easy to sing. A leap of a third in melody refers to the distance between two notes that are separated by three scale degrees. Leaps help in making the melody to be singable.

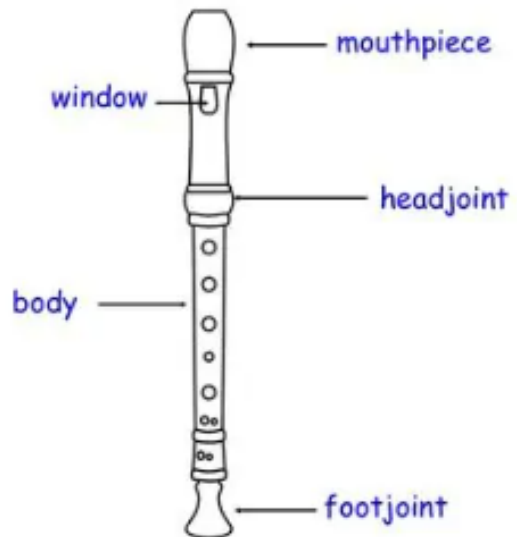
- Identifiable Shape/Contour: This is the direction of melody. It can be ascending or descending, fast or slow, higher or gentle.
- Symmetry: this is when parts/ phrases of a melody mirror each other thus making the melody to be interesting and memorable.
- Starts on d, m, or s: The tonic (d) is the first and most important note of a scale. m (mi): The mediant is the third note of a scale. The mediant (m) note is used to start interesting and less predictable melodies. s (sol): dominant: starting a melody on a dominant (s) creates an interesting melody that attracts the listener who is eager to hear more.
- Ends on d: A good melody often resolves back to the tonic and on a stable note that gives a sense of ending or conclusion.

21. Soh

22. Low dribbling

23. To score goals.

24.



25. A booklet with images that gradually change from one page to the next, creating the illusion of movement when flipped quickly.

END OF TERM II ASSESSMENT I

1. Artistic forms that are perceived and appreciated by sight or by eyes; they include; paintings, drawings, photomontage, dance, drama and film.
2. In sports, the participants wear uniform and sportswear that are appropriate and provide comfort while performing.
 - Such attires include; swimming costumes, playing kits, running kits, sports shoes
 - In team sports, the participants wear similar playing kits for ease in communication and collaboration.
 - In creative arts the performers wear costumes that reflect character, cultural background and time in history.
3. **Character:** This is the person, animal or being that do the action an interact with others in a story.

Setting: This is the location, time and period when the action in a story takes place from the beginning to the end.

Plot: This is the order of events in a story.

Theme : This is the main/ central idea in a story.

4. -Taa-aa -taa - ta-te
5. This is the lowness or highness of sound in music
6. taa-aa-aa-aa
- 7.



Ledger lines are used to notate pitches that are outside the staff's normal range.

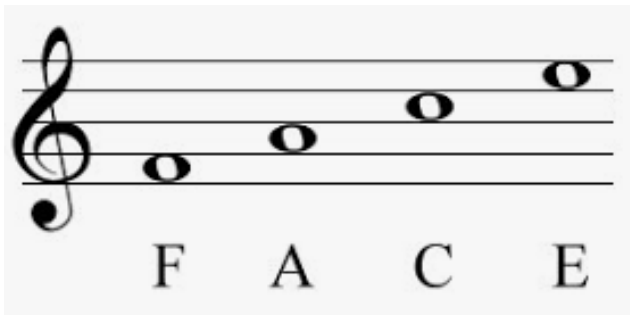
8. The signature is a symbol that indicates how many beats are in a measure and what note values represent one beat.
9. Pair of quavers pair of quavers
Crotchet crotchet minim
10. Strength refers to the ability of a person's muscles to exert force against an object or to overcome resistance.
11.
 - Pencils • Charcoal
 - Chalk • Crayons
 - Coloured pencils
12. Balance ensures that the drawing has stability and guides the viewers' eyes across the artwork.
13. Blending
14. blue (clean water) green stagnant water with hyacinth
15. Semibreve
16. Julius Yego used you-tube videos to learn javelin throwing.
17. Sculpture is the art of modifying materials to create three-dimensional artworks.
18. F (first space)
 - A (second space)
 - C (third space)
 - E (fourth space)
19. -Singable with leaps of a 3rd.
-Has identifiable shape/contour.
-Has symmetry.
- Starts on d, m or s.
-Ends on d to show finality.

END OF TERM II ASSESSMENT II

1. These are creative activities and arts that that are perceived through the use of the eyes.
 - Photography
 - Painting
 - Montage
 - Puppetry
 - Drawing
 - Collage
 - Pottery
2.
 - i. Using the scissors they cut out the materials you are going to use in the collage.
 - ii. They sketched the layout and divide the sections for each category of creative arts and sports.
 - iii. They created the labels for each category of creative arts and sports.
 - iv. They positioned each label at the top of each section of the categories of creative arts and sports.
 - v. Before gluing arrange the materials onto the base surface, they layered the images in the places as you wish them to be.
 - vi. They glued the pieces by starting with the largest pieces and work all the way to the smallest and finer pieces. Use the tweezers to place the smaller pieces.
 - vii. They overlapped the materials and add fabric, contrasting colours, textured paper to create depth.
 - viii. Finally, they displayed the collage for appreciation by teacher.
3. Varied answers for example;
 - Ferdinand Omanyala- sprints
 - Mary Moraa- medium distance races
 - Julius Yego- javelin throwing
 - Faith Kipyegon- medium distance races
 - Kipchoge Eliud- marathon

4. This is the organization of events in a story from the introduction, development, climax and conclusion.

5.



6.



Duration: $\frac{1}{2}$ beat

7. Ledger lines are the short lines that extend above or below the treble staff to notate pitches that are outside the staff's normal range. Ledger lines are used to indicate pitches that are higher or lower than the staff's normal range.

8. warm colours: red, orange or yellow

9. If the note falls on or above the middle line (B), the stem points down and the it is placed on the left-hand side.

- If the note is below the middle line B, the stem points upwards and it is placed on the right-hand side.

10. Phase 1: carry

Phase 2: approach run

Phase 3: cross over

Phase 4: release

Phase 5: follow through

11. In melody, a lead is an interval between two pitch notes that involves jumping between notes that are three steps away in the musical scale.

12. flick pass

13.

- She covered the pitch holes fully thus avoided air leakage.

- She blew gently.
- She ensured precise fingering of the pitch holes thus produced accurate intonation.
- She ensured that she used the correct techniques of playing a descant recorder.

14.

- Circumcision/ initiation
- Marriage ceremonies
- Burials
- Birth of children
- Naming of children
- Harvesting period
(mark any relevant response)

15. The criss-cross beadwork technique the players wore them to show their loyalty and patriotism as Kenyans.

16. Supine position

17. - Always swim under the supervision of your teacher or instructor.

-take note of the depth of the pool and avoid deep ends.

-Warm up before swimming to avoid muscle strain or cramps.

-Only dive in areas designated for diving and where the water is deep enough.

-follow the pool rules

- Swim within your comfort zone and avoid overexertion.

-Use appropriate swimwear gear and use floatation devices if you have not mastered swimming skills appropriately.

- do not swim when you are feeling ill.

18. plaiting

19. Ta-te ta-te ta-te ta-te ta-te taa taa

20. Steps

i. sketching the image of the javelin on the wood considering the general shape.

ii. carve out the negative parts of the javelin focusing on the shape and pointedness.

iii. Decorate the javelin.

21. jump shot

22. Patriotic songs are musical compositions that express love, pride, loyalty, and devotion to one's country. These songs are used to celebrate national identity, history, values, and achievements, and they unite people by fostering a sense of collective national pride.

23. - Maintaining possession of the ball.
- Setting ground for passes, dribbling or shooting.

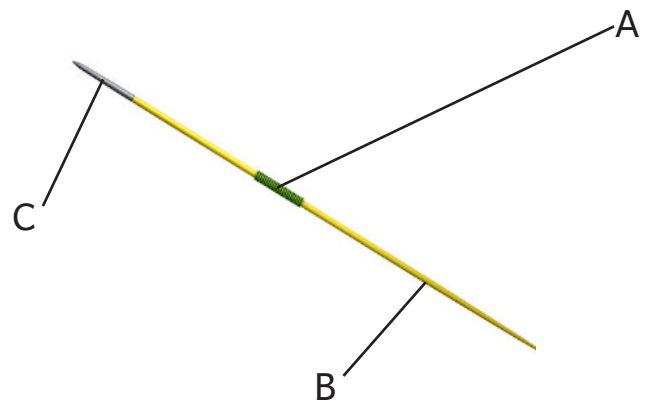
24. Crayon etching is the process of making pictorial compositions where shapes, patterns and images are scratched using sharp tools through a layer of blank ink to show desired compositions underneath.

END OF TERM III ASSESSMENT I

1. A collage is a piece of art created by collecting assembling different materials like coloured paper, fabric, photographs and written cut-outs and sticking them onto a surface using adhesives.
2. • Music is used in sports to help athletes maintain rhythm and coordination during training or performance.
 - Music can be played to motivate athletes and create an energetic atmosphere during sports events.
 - Music is essential in warmup exercises since it provides beats and rhythm that provide pace and ensure coordination.
 - Music is essential part of celebrations after sports events.
3.
 - a. **Setting:** The setting is the time and place in which a story occurs.
 - b. **Theme:** The theme is the central idea or message that the story passes across to the audience.
4.
 - a) carry
 - b) Approach
 - c) run
 - d) cross over
 - e) release/ throw
 - f) follow through

5.
 - Pencils
 - Charcoal sticks
 - Crayons
 - Wax
6. Cool colours are colours that evoke a sense of calmness in the audience.
 - shades of blue, green, and purple.
 - Blue
 - Green
 - Purple
7. Time signature indicates how many beats are in each measure.

8.



- A. Grip
B. Shaft
C. Metal tip

9.
 - Use the left thumb to cover the back hole.
 - Cover all the holes.
 - Support the recorder using the right-hand thumb.
 - Blow gently to produce the note of C.
10.
 - Use of gestures
 - Use of voice
 - Facial expressions
 - use of body
 - use of songs
 - audience involvement
 - use of props
 - use of costumes

11. Using a toothpick or sharp object to scratch or etch the top layer to reveal the forms underneath.

12. Patriotic songs that are sung express love, loyalty and devotion.

- National anthem
- East African community anthem
- Loyalty pledge
- School anthem

13. • Voice projection balance.

- Phrasing
- Tempo
- Tone
- Dynamics
- Expression and interpretation
- Gestures and movement
- Intensity
- Mood
- Idiom/ authenticity

* (Mark if the responses imply any of the above by definition or explanation.)

14. a. Collect materials such as coloured wax and pigments of colour.

b. Melt the wax and mix with the pigments of colour.

c. Pour the mixture into moulds and let it harden.

d. Remove from moulds.

15.



16. Pencil dive and crouch dive.

17. Backstroke

18. - Always swim under the supervision of your teacher or instructor.

- Take note of the depth of the pool and avoid deep ends.

- Warm up before swimming to avoid muscle strain or cramps.

- Only dive in areas designated for diving and where the water is deep enough.

- Follow the pool rules

- Swim within your comfort zone and avoid overexertion.

- Use appropriate swimwear gear and use floatation devices if you have not mastered swimming skills appropriately.

- Do not swim when you are feeling ill
($\frac{1}{2}$ a mark each mark any appropriate responses.)

19. plaiting

20. varied answers. Mark relevant and appropriate responses.

END OF TERM III ASSESSMENT II

1. Ways in which learners express patriotism through creative activities

i. Visual Arts (Painting, Drawing, Sculpture): Artists can create works that reflect national symbols, landmarks, or historical moments

ii. Creating and performing patriotic songs that celebrate the history, culture, and values of the nation can be a powerful form of patriotism. Patriotic anthems or national songs, whether classical or modern, can stir emotions of unity and national pride.

iii. Performing in plays that portray national heroes, cultural traditions, or historical events is an effective way to teach others about the nation's past while fostering a sense of belonging and pride.

iv. Creating and wearing clothing that incorporates the national flag, colours, or symbols can be used as costumes to express patriotism. This can include traditional attire designs that reflect national pride.

v. Collaborating with local communities to create public art that reflects shared values, heritage, and the spirit of the nation can foster a sense of collective patriotism.

- vi. Organizing Cultural Festivals: Taking part in events that showcase national music, dance, food, and crafts fosters national pride and unity. These festivals can celebrate important national holidays or commemorate significant historical events.
 - vii. Engaging in Community Traditions and Rituals: Reviving and sharing local customs, dances, or traditional ceremonies tied to national identity can help preserve heritage while building a sense of pride in national culture.
 - viii. Promoting Traditional Crafts: Supporting or creating artwork, jewellery, pottery, and other crafts that reflect local cultural practices helps preserve and promote national heritage.
2. Equality in sports, ensures that players from different social backgrounds, ages, gender, and races have equal chances of participating. The participants are given equal treatment and when they win, they receive uniform awards.
 3.
 - Measure the material into the size of A3 (30cmX 42cm).
 - Fold the material into two.
 - Sketch out the design and cut the material into the A3 size.
 - Use glue or double-sided tape create pockets for loose papers.
 - Create a cover using a piece of fabric.
 - Make binds using a ribbon or elastic band
 - Secure the edges using stapler and pins.
 4. The player is eliminated and another one is given the chance to play.
 5.
 - Maintaining Consistent Rope Speed and Rhythm so as the jumpers have a fair chance to time their jumps. They should not speed up or slow down the rope intentionally to disadvantage or throw off the jumper. Integrity in maintaining a steady pace helps keep the game enjoyable and fair for all players.
 - Avoiding Interfering with the Jumper's


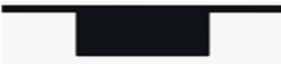






Performance: The rope turners should not deliberately distract or interfere with the jumper.

- Being Honest in Their Observations: If a jumper makes a mistake (like tripping on the rope or failing to clear it), the rope turners should honestly report the error, rather than letting the jumper continue if they've clearly broken a rule. Integrity requires them to play fairly and not let personal biases or favouritism influence their actions.

- Avoid Cheating (e.g. Altering the Rope Path): Rope turners should not cheat by altering the path or direction of the rope in ways that are meant to confuse or trap the jumper. They should not intentionally change the swing of the rope to cause the jumper to fail. Playing with integrity means ensuring the game is challenging but fair.

6. **Face Up:** The swimmer's face stays above the water, looking straight up or slightly toward the sky.
7. Pencil dive and crouch dive.
8. Arm Action:
 - Arms are extended forward, with palms facing down.
 - Reach one arm above your head.
 - Enter the arm in the water palm-first.
 - Drive the arm downward and outward.
 - Turn at the elbow to sweep the arm in toward your hip.
 - Alternate arms in a continuous cycle.
9.
 - Proper diction; Pronounce the words clearly and appropriately.
 - Apply proper dynamics, tone and pitch that are attributed to the patriotic song.
 - Use appropriate facial expressions that help in emphasising on the message of the song.
 - Use appropriate and allowed body language; when performing national anthems observe the body etiquette approved. Minimise unnecessary body movements.

- Perform in platforms that allow and respect the patriot song that you want to perform.
- 10. A collage is a creative artwork made by collecting and arranging various materials, such as images (photographs, prints, paintings, drawings), Text (words or phrases) and Objects (paper, fabric, ribbons and found objects,) onto a single surface, by using adhesives such as glue and tape to create an artistic composition.
- 11. Activities in visual arts:
 - Painting - Drawing - Sculpture - Photography
 - Creation of montage and collage - Displaying and appreciation of visual arts.
- 12. Character, setting, theme and plot.
- 13.

Note name	Symbol	Rest	Value
Semibreve			4 beats
Minim			2 beats
Crotchet			1 beat
A pair of quavers			1 beat

- 14. - Agility ladder drills - balance beam exercises
- juggling - ball dribbling
- gymnastics - Zumba
- Jump squats
- 15. The lines and spaces on the treble staff are named and numbered from the bottom upwards.
- 16. 2/4 time means that there are two beats in each bar in a pattern.
- 17. Balance in drawing refers to the equal distribution of visual components in a drawing.
- 18. To achieve darker tones more media is applied on the surface and lighter tones are achieved by limiting the amount of media used.
- 19. Taa-aa-aa-aa
- 20. A rest lasts as long as its note value would last.
- 21. Carving
- 22. Javelin
- 23. Jump pass in handball

24.

Notes	Finger position
C	LT F1 F2 F3 F4 F5 F6 F7
C ¹	LT F2

- 25. Thanos projected his voice properly to ensure that he was audible enough he also pronounced all the words properly.