**PRIMARY SIX MATHEMATICS LESSON NOTES**

**TERM ONE**

**LESSON ONE**

**THEME: SET CONCEPT**

Types of sets

Listen and write

* Unequal
* Equal
* Sets
* Vowels

**Examples**

1. Use equal sets or unequal sets

A= {a,b,c,d,e}

B= {x,y,I,o,u}

Set A and B are unequal sets

1. Use equal sets and unequal sets

X= {1,2,3,4,5,6}

Y= {4,5,6,3,2,1}

X and Y are equal sets

1. Use equal sets or unequal sets

P= { , , }

Q= { , , }

P and Q are equal sets

Exercise

Compare using equal or unequal sets

1. E= {pens, pencil, rubber} and F= {pen, pencil, rubber, ruler}
2. G= {1,3,5,7,9} and H= {7,3,9,1,5}
3. R= {mon, tue, wed, thur, fri} and T= {sun, mon, wed, thur, fri, sat}

**LESSON TWO**

**Differentiating equivalent sets from equal sets**

**Listen and write**

* Equivalent
* Sets
* Equal

Example

1. If M = {0,2,4,6,8} and N= {1,3,5,7,9}

M and N are equivalent sets

1. If A= {1,3,5,7,9} and B={9,1,7,3,5}

A and B are equal sets

**Activity**

Describe the following pairs of sets using equal sets or equivalent sets

1. E= {hen, duck, turkey} and F={elephant, leopard, lion}
2. G= {4,6,8,0,2,10} and H= {0,2,4,8,10}
3. J= {apple, ape, arrow, axe} and K={axe, arrow, ape, apple}
4. M= {a,c,e,g,I,k,m,o,q,s} and N= {a,d,f,h,I,n,p,r,t,s}
5. P= {2,3,5,7,11,13,17} and Q= {1,3,5,7,9,11,13}
6. R= {beans, peas, maize, millet} and S= {peas, millet, beans, maize}

**LESSON THREE**

Listen and write

* Universal
* Elements
* Set
* Shading

Identifying universal sets

**Example 1**

8 1 0 4

9 3 2 5 6 7

Ɛ = {1,3,0,2,4,5,6,7,8,9}

n(Ɛ) = 10

Shade, list and count members of universal set

P

B Ɛ

a b c

d f

e

g h

Ɛ= {a,b,c,d,e,f,g,h}

n(Ɛ) = 8

**Exercise**

Shade, list and count elements of the universal set.

1. Shade the universal set

spade

panga hoe rake

axe

can

1. Count elements of the universal set

P

Q

0 2 3

6

4 8

**LESSON FOUR**

Identifying Complement Sets

Listen and write

* Complement
* Universal
* Set

Examples

1. Shade, list and count members of the complement sets

A B

7 9

Ɛ

A1 = Ɛ-A

A1 = {6,8,7,9}

n(A1) = 4

1. (AuB)1

**A**

**B**

f h g

f h g

(AuB)1= {f,g,h}

n(AuB)1 = 3

**Exercise**

Shade list and count the members of the complement sets

1. n(AuB)1

A B

12 13 14

Ɛ

1. n(AnB)1

book bottle box **A Ɛ**

**B**

Bag bed

pot

1. n(AuB)1

**A**  **B**

1. n(X)1

**Y**

gold silver **X**

tin

copper

zinc lead

**LESSON FIVE**

Listen and write

Subset

Symbol

Empty set

Identifying subsets

**Examples**

If Q = { } give all possible subsets formed from Q as follows

1. Subsets with one member {Ο} {Δ}
2. Subset with two members {Δ,Ο}
3. Subset with no members { }

All subsets formed from Q are ={ {Ο}, {Δ}, {Δ,Ο}, { }}

A set containing some or all members of a mother set is called a subset.

Example 2

If P={a, b, c} list all subsets of set P

The one member subsets are {a}, {b}, {c}

The two members subsets are {a,b}, {a,c}, {b,c}

The three member subsets is {a, b, c}

The no member subset is { }

All subsets of P= {a}, {b}, {c}, {a,b}, {a,c}, {b,c}, {a,b,c}, { }

Exercise

Work out

1. If A ={Δ,□,Ο} list all subsets of set A
2. If B ={Ѽ,֍} list all subsets of set B
3. Given that C={2, 3, 4, 5} list all subsets of C
4. Given that D= {a, e, I, o} list all subsets of D
5. If E= {cow, goat} list all subsets of F
6. If G= { } list all subsets of set G

**LESSON SIX**

Listen and write

Subsets

Exponents

Factorization

Finding number of subsets

Example 1

If A= {a, b, c} how many subsets can be formed from set A?

The number of elements (n) = 5 elements

The number of subsets is given as 2n  =25

=2\*2\*2\*2\*2

=32 subsets

Exercise

Find the number of subsets in each of the given sets below

1. A= { }
2. D= { lizard, gecko, rat, cat}
3. E= {a, e, I, o,u}
4. G= {pen, pencil, ruler, duster, chalk, key}
5. K={a, b, c, d, e, f, g, h}

**LESSON SEVEN**

Listen ad write

Subset

Factorization

Elements

Sets

**Example 1**

Set M has subsets. How many members does it have ?

|  |  |
| --- | --- |
| 2 | 8 |
| 2 | 4 |
| 2 | 2 |
| 1 | 1 |

8 = 23

2n =23

n= 3

set M has 3 elements/ members

Example 2

Set A has 16 subsets. Find the number of elements in set A

|  |  |
| --- | --- |
| 2 | 16 |
| 2 | 8 |
| 2 | 4 |
| 2 | 2 |
| 1 | 1 |

16= 24

2n=24

n = 4

Set A has 4 elements

Exercise

1. Set X has 64 subsets, how many members does set X have?
2. If set P has 256 subsets, how many does set P have?
3. Find the number of elements in a set with;
4. 2 subsets
5. 4 subsets
6. 4 subsets
7. 512 subsets

**LESSON EIGHT**

* Listen and write
* Venn diagram
* Union
* Describe
* Intersection

Describing different parts of a venn diagram

Example

Describe the shade fractions

1 P Q 2 P Q

Members for p= set P members for P but not for Q= set P-Q or P only

3 P Q 4 P Q

members for Q set Q members for Q but not P=set (Q-P) or Q only

5 P Q p Q

Members for both P and Q = set (PnQ) All members in P and Q= set (PuQ)

Exercise

Copy and describe the shaded set

1 M N 2 M N

3 M N

For each of the numbers 4 to 7, draw a venn diagram and shade the described set

4 XuY 5 AnB 6(A-B) 7M-N

**LESSON NINE**

Listen ansd write

Only

Represent

Complement

Using venn diagrams to represent information

Example 1

In a group of 10 girls, 5 got cakes (c), 6 got sweets (s) 2 did not get any of the two and some (x) got both. How many got both sweets and cakes?

n(C)=5 n(S)=6

2

5-x=x=6-x=2 = 10

13-13-x = 10-13

-x/-1 = -3/-1

X= 3

Three pupils got both cakes and sweets

Example 2

In a class of 12 pupils, 4 like mathematics (M) only, 2 like both mathematics and English €, X like only English and 1 does not like the two subjects. Find the value of X.

n(M)= 6 n(E)= 2=x   
1

4=2=x=1= 12

X=7=12

X+7-7= 12-7

X=5

Exercise

Draw a venn diagram and find the value of x.

1. In a class of 30 pupils, 18 like music(M), 21 like art, X like both
2. In a group of 20 people, 13 speak English (E), 11 speak French F, 3 do not speak any of the two languages but x speak both
3. In a team of 11 players, 4 use only the left leg(L), 3 both legs and x use the right leg R only. Find the value of x

**LESSON TEN**

Listen and write

Using venn diagrams to solve problems

Example 1

In a class of 30 pupils, 16 like English (E), 17 like mathematics (M) while 7 do not like the two subjects. Find the number of pupils who:

1. Like both
2. Like only English
3. Like only mathematics n(Ɛ)=30

n(E)= 16 n(M)=17

7

16-x+x+17-x=7 =30

16+17+7-x+x-X =30

40-x =30

40-x =30

-x=30-40

-x/-1 = -10/-1

X = 10

Exercise

Use venn diagrams to solve the following

1. In a club of 40 people, 32 like basketball (B), 30 like hockey (H) and X people like both gaes. Ho many like
2. Both games
3. Only one game
4. In our village there were 86 farmers. If 63 farmers reared cow(C) and 54 reared goats (G), how many reared omnly one type of animals
5. At a party of 27 guests, 11 drunk onlyfanta (F), 9 drunk both fanta and mirinda, 4 only mirinda (M), X did not take any. Find the value of x

**LESSON 11**

Listen and write

Probability

Chance

1. In a group of 8 pupils, there was a chance for one of them to be chosen a group leader. Given the chance in numerical figure

The chance will be = no. of desired events

Total number of pupils

= 1

8

The chance for one or anyone to be chosen compared to the total number is what we call probability.

1. From a group of 15 men, 7 were to be given presents. What was the probability that any of them would get a present?

The chance (probability) = expected number

Total number

= 7

15

Exercise

Calculate;

1. In a box, there are some pencils of different colours; 8 black, 4 red and 6 brown ones. What would be the probability of choosing a
2. Brown pencil
3. Black pencil
4. From the nmbers 7,3,4,5,1 what would be the probability of choosing
5. An even number
6. An odd number
7. Two numbers whose total is 8
8. There are some cars of different colours, (7 maroon, 8 black and 5 green). What is the probability of packing a car of black colour at random?

**LESSON 12**

Listen and write

Chance

Probability

Random

Calculating probability from venn diagrams

**Example 1**

The venn diagram represents the numbers of members in set A and B. calculate the probability of choosing a member who belongs to AnB

1

Probability = n(AuB)

n(Ɛ)

=5

3+5+8+1

=5

17

**Example 2**

Calculate the probability of choosing a member who belongs to P1

2

Probability (P1)= n(P1)

n(Ɛ)

= (13+2)

(15+2+10+13)

=15

40

Exercise

Calculate the probability of choosing a member who belongs to named sets

1. (AnB)

n(A) n(B)

1. (P-Q)

n(P) n(Q)

1. Y

n(X) n(Y)

5

LESSON 13

* Listen and write
* Probability
* Chance
* Random
* Sample space

Calculating probability using a venn diagram

**Example 1**

In a dozen of members, 7 can sing (S), 8 can dance (D) and 3 can both sing and dance. What is the probability of choosing a member that can only dance.

n(Ɛ)= 12

n(S)=7 n(D)=8

Probability (D) only = no. of desired events

Total number

= n(D) only

n(Ɛ)

= 5

12

**Example 2**

In a class of 20 pupils, 15 eat meat (M), 10 eat fish (F), 2 do not eat any of the two but x eat both. What is the probability of choosing at random a pupil who eats both meat and fish?

n(Ɛ)=20

n(M)=15 n(F)=10

Find the value of x

(15-x) + x + (10-x) + 2= 20

27-x+x= 20+x

X+20-20 = 27-20

X= 7

Prob(MnF) = n(MnF)

n(Ɛ)

= 7

20

Exercise

1. At a party of 8 friends, 1 drank only water(W),3 drank both water and soda, 2 drank only soda but x did not drink any of the two.

Find the probability of talking to a friend who drank none of the drinks

1. In a group of 10members, 7 enjoy rice R, 5 enjoy millet M but X members enjoy both rice and millet. What is the probability of choosing a member who enjoys both meals?
2. In a class of 20 pupils is take part in both but X not in any. What is the probability of a teacher calling on a pupil who does not like any of the two activities?

**LESSON 14**

**Theme:** Numeracy

**Topic** : whole numbers

Place values of 7 digit numbers

Listen and write

* Million
* Thousands
* Place values
* Hundreds

Example

Given the number 2,430,956; write the place value of each digit

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Millions | | | Thousands | | | Units | | |
| H | T | O | H | T | O | H | T | O |
|  |  | 2 | 4 | 3 | 0 | 9 | 5 | 6 |

The place value of 2 is one millions

The place value of 4 is hundred thousands

The pace value of 3 is ten thousands

The place value of 0 is one thousands

The place value of 9 is hundreds

The place value of 5 is tens

The place value of 6 is ones

Exercise

1. Write the place value of each digit in the numbers below
2. 302,486
3. 1452609
4. 2,782,146
5. Study the numbers below and write the digits which are in the ten thousands place value
6. 624,357
7. 1,240,683
8. 470,358

**LESSON 15**

Values of 7 digit numbers

Listen and write

* Sum
* Difference
* Product
* Value

Example

1. What is the value of each digit in the number 1,725,084

1 7 2 5 0 8 4 Place Multiplication Product

Ones 4\*1 =4

Tens 8\*10 =80

Hundreds 0\*100 =0

Thousands 5\*1000 =5000

Ten thousands 2\*10,000 =20,000

Hundred thousands 7\*100,000 =700,000

One million 1\*1000,000 =1,000,000

1. What is the value of 6 in the numbers 2 8 3 5 6 7 9

2 8 3 5 6 7 9 place values multiplication product

Hundreds 6\*100 600

The value of 6 is 600

Exercise

1. Find the value of each digit in the following numbers
2. 402,568 b) 1359246 c) 4826573 d) 6473208
3. What is the value of 8 in each of the following numbers
4. 653,482 b) 3871056
5. What is the sum of the values of 2 and 3 in 65213?
6. Find the product of value of 5 and the value of 3 in 65213

**LESSON 16**

Writing numbers in expanded form using values

Listen and write

* Expand
* Value
* Enlarge

Example

1. Write 445,156 in expanded form using values

4 4 5 1 6 7

7\*1 =7

6\*10 =60

1\*100 =100

5\*1000 =5000

4\*10,000 = 40,000

4\*100,000 =400,000

Activity

Expand the following in value form:-

1. 2248015
2. 36024
3. 80004
4. 258
5. 6725384

**LESSON 17**

Expanded form using powers of ten / exponents

Listen and write

* Expand
* Exponents
* Powers

Examples

1. Expand 247 using powers of ten

247

=200 + 40 + 7

Activity

Expand the following in the value for,

1. 2248015
2. 36024
3. 80004
4. 258
5. 6,725,384

**LESSON 17**

Expanded form using powers of ten / exponents

Listen and write

* Expand
* Exponents
* Powers

Examples

1. Expand 247 using powers of ten

247= 200 + 40 + 7

= (2x10x10) + (4x10) + (7x1)

= (2x102) + (4x101) + (7x100)

1. Expand 54672 using powers of ten

54672 = 50,000 + 4000 + 600 + 70 +2

= (5x10x10x10x10) + (4x10x10x10) + (6x10x10) + (7x10) + (2x1)

= (5x104) + (4x103) + (6x102) + (7x101) + (2x100)

**Exercise**

Expand the following using powers

1. 36214
2. 9961056
3. 104050
4. 7159674
5. 3056482
6. 702854
7. 269480

**LESSON 18**

Finding expanded numbers

Listen and write

* Expanded number
* Single number
* Short form
* Add

Examples

1. Write 2,000,000 + 6,000,000+ 7,000 + 900 + 7 in short form

2000000

6000000

7000

900

+ 7

2607907

1. Express (7x1000000) + (5x100000) + (6x100) + (2x10) as a single number

7000000

500000

600

+ 20

7500620

Exercise

Write the following in short form

1. 3000000 + 7000 + 800 + 20 + 5
2. 400 + 60000 + 5000000 + 5 + 70 + 9000
3. (6x1000000) + (3x100000) + (4x100) + (8x10) + (1x1)
4. (5x1000000) + (5x10000) + (5x100) + (5x1)
5. (9x10) + (3x1) + (7x100000) + (4x1000000) + (5x10000)

**LESS0N 19**

Writing and reading whole numbers in words

* Millions
* Thousands
* Earn
* Amount

Example

Nakitto earns sh.3257550 every month. Write the amount of money she earns in words.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MILLIONS | | | THOUSAND | | | UNITS | | |
| H | T | O | H | T | O | H | T | O |
|  |  | 3 | 2 | 5 | 7 | 5 | 5 | 0 |
| three | | | Two hundred fifty seven | | | Five hundred fifty | | |

Three million , two hundred fifty seven thousand five hundred fifty.

Exercise

1. Write the numbers in words
2. 638189
3. 1231979
4. 1645540
5. There are 2435870 books in the public library. Write the number in words
6. Anite paid shs 5652500 for a car. Write the amount in words.
7. Kwikiriza deposited sh. 7830175 on his bank account. Express the money he deposited in words.

**LESSON 20**

Reading and writing whole numbers in figures

Listen and write

* Figures
* Fuel station
* Whole number
* Hundred
* Million

Examples

1. Write in figures; three million two hundred sixty five thousand eight hundred fifty two

Three million 3000000

Two hundred sixty five thousand 265000

Eight hundred fifty two 852

3265852

1. A fuel station sold one, million four hundred fifty seven thousand sixty eight litres of fuel a month. Write the amount of fuel which was sold in figures

One million 1000000

Four hundred fifty seven thousand 457000

Sixty eight 068

1457068

Exercise

Write the numbers below in figures

1. Three hundred sixty four thousand, one hundred seventy
2. Eight hundred four thousand, six hundred nineteen
3. Two million two hundred eleven thousand, five hundred ten

**LESSON 21**

Reading and writing roman numerals (forming a numeral Album 1000)

Listen and Write

* Numeral Album
* Hindu Arabic
* Forming

Study the key Roman numeral

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Hindu Arabic | 1 | 5 | 10 | 50 | 100 | 500 | 1000 |
| Roman numeral | I | V | X | L | C | D | M |

Numerals beginning with the digits 2 and 3 are got by repeating

|  |  |  |  |
| --- | --- | --- | --- |
| Hindu Arabic | 2 = I+I | 20 = (10+10) | 200 = (100+100) |
| Roman numeral | II | XX | CC |

|  |  |  |  |
| --- | --- | --- | --- |
| Hindu Arabic | 3 = I+I+I | 30 = (10+10+10) | 300 = (100+100+100) |
| Roman numeral | III | XXX | CCC |

Numerals beginning with the digit 6 7 and 8 are got by adding

|  |  |  |  |
| --- | --- | --- | --- |
| Hindu Arabic | 6=5+1 | 60 = (50+10) | 600 = (500+100) |
| Roman numeral | VI | LX | DC |

|  |  |  |  |
| --- | --- | --- | --- |
| Hindu Arabic | 7=5+2 | 70 = (50+20) | 700 = (500+200) |
| Roman numeral | VII | LXX | DCC |

|  |  |  |  |
| --- | --- | --- | --- |
| Hindu Arabic | 8=5+3 | 80 = (50+30) | 800 = (500+300) |
| Roman numeral | VIII | LXXX | DCCC |

Numerals beginning with the digit 4 and 9 are got by subtracting

|  |  |  |  |
| --- | --- | --- | --- |
| Hindu Arabic | 4=5-1 | 40 = (50-10) | 400 = (500-100) |
| Roman numeral | IV | XL | CD |

|  |  |  |  |
| --- | --- | --- | --- |
| Hindu Arabic | 9=10-1 | 90 = (100-10) | 900 = (1000-100) |
| Roman numeral | IX | XC | CM |

**LESSON 22**

Converting Hindu Arabic numerals to Roman Numerals

Listen and write

Convert

Hindu Arabic

Roman numeral

Example

1. Convert 87 to a roman numeral

87= 80+7

=LXXX + VII

=LXXXVII

1. Mary scored 394 marks out of 400. Express the marks she scored as a roman numeral.

394= 300+90+4

=CCC + XC + IV

=CCCXCIV

Exercise

1. Convert the following to Roman numerals
2. 64
3. 178
4. 275
5. 343
6. 459
7. 506
8. 624
9. 717
10. The head teacher bought 154 new desks. Write the number of desks that were brought as a Roman numeral.
11. An ordinary year has 365 days. Express the days in ordinary year as a roman numeral.
12. Our librarian numbered 850 new books using Roman numerals. Express the number as a Roman numeral

**LESSON 23**

**Changing Roman to Hindu Arabic numerals**

Listen and write

Fuel

Truck

Roman

Expand

Roman numerals

Hindu Arabic

**Example**

1. write CCLVI as a Hindu Arabic numeral

CCLVI = CC XL VI

=200+40+6

=246

1. The label on the fuel truck bears the numeral DCCXCIII

DCCXCIII =DCC XC VIII

=700+90+8

=798

Exercise

Write in Hindu Arabic

1. XLIX
2. CCLXII
3. CDXXIX
4. DLXXXIX
5. DCCLIX
6. DCXXXVI
7. The last page of our mathematics text book bears the numeral CXCVI. Write the numeral on the last page in Hindu-Arabic.

**LESSON 24**

THEME: NUMERACY

TOPIC: OPERATION ON WHOLE NUMBERS

Addition of 7 digit numbers without regrouping

Listen and write

Regrouping

Vertical

Registered

**Example**

1. Work out 2432573 + 3543425

Arrange vertically then add

2432573

+ 3543425

5975998

1. A district registered 1245365 voters and another district 234132 voters. What is the total number of voters?

1245365 votes

+ 2343132 votes

3588497 votes

Exercise

Workout

1. 3145334 + 5342653
2. 4532361 + 2353426
3. 5314516

+ 2423423

1. A town had a population of 4132254 people. After 10 years the population increased by 1435224 people. What is the current population?

**LESSON 25**

**Addition of 7 digit numbers with regrouping**

**Listen and write**

Add

Reduced

Iron sheets

Sum

Regrouping

Workout

1. 2436375 + 5275865

Arrange vertically then add

2436375

+ 5275865

7712250

1. A factory produced 2364875 iron sheets last year. This year it produced 3417675. What is the sum of all the iron sheets.

Last year 2364875 iron sheets

This year 3417675 iron sheets

5782550 iron sheets

Exercise

1. 1211361

+ 5245141

1. 4241614 + 3148173
2. 4777874 + 3167218

**LESSON 26**

Word problem involving addition

Listen and write

Voters

Population

Total

Sum

**Example**

A district registered 1245365 voters and another district 2343132 voters. What is the total number of voters?

First district 1245365

Second district + 2343132

3588497

Exercise

1. A town had a population of 4,132,254 people. After 10 years the population decreased by 1435224 people. What is the current population?
2. A factory makes 3375400 red pens and 4741867 blue pens every month. What is the sum of all the pens made?
3. A garment factory produced 4247367 shirts last year. The production this year is 2147680 shirts. Find the total number of shirts produced in the 2 years.

**LESSON 26**

Subtraction of 7 digit numbers without regrouping

Listen and write

Difference

Remainder

Arrange

Reduce

Example

1. Workout 493675 – 241360

Arrange vertically

493675

- 241360

252315

1. A brick maker made 2430840 bricks. He sold 1200430 bricks. How many bricks remained

Arrange vertically and subtract

2430740

- 1200430

1230410

Exercise

1. 4748675 – 3516423
2. 8768953 – 5561741
3. A fuel station had 2434840 litres of fuel. It sold 1210230 litres. How much fuel remained?
4. Out of the 5356750 bars of soap that were produced at a soap factory 4234310 bars were sold. How many remained?

**LESSON 27**

Subtract of 7 digit numbers with regrouping

Listen and write

Decrease

Difference

Subtraction

Take away

Example

1. Work out

4389356 – 2674189

Arrange vertically

4389356

- 2674189

1715167

1. A truck carried 3424189 pairs of slippers 1174211 pairs were red, how many pairs were of the other colour?

A truck carried 3424189

Red colour - 1174211

Other colour 2249978

Exercise

Workout

1. 2361245 -1078143
2. 6404243 -2715834
3. 3184149 – 1537247
4. A factory produced 6740850 forks. They sold some of them and remained with 1245955 forks. How many forks were sold?

**LESSON 28**

Word problem solving subtraction

Listen and write

Remainder

Balance

Range

Take away

Example

1. A truck carried 3424189 pairs of slippers. 1174211 pairs were red, how nay pairs were of other colours.

A truck carried 3424189

- 1173211

2249978

1. A brick maker made 2430840 bricks. He sold 1200430 bricks. How many bricks remained

Bricks made 2430840

- 1200430

1230410

Exercise

1. A fuel station had 2434840 litres of fuel. It sold 1210230 litre, how much fuel remained?
2. A factory produced 6740850 forks. They sold some of them and remained with 1245955 forks. How many forks were sold?
3. 5207342 pieces of timber were impounded by natural forests Authority 3267804 pieces were sold in an auction. How many pieces of timber remained?

**LESSON 29**

Multiplication of 5 digit numbers by 2 or 3 digit numbers

Iisten and write

Multiplication

Product

Multiplier

Multiply

Example

1. Work out 14345 x 24

14345

X 24

57380

+ 286900

344280

1. Each school got 214 textbooks from ministry of education. If there were 12456 schools. How many books were given out?

12456

X 214

49824 (12456x4)

124560 (12456x10)

+ 2491200 (12456x200)

2665584 books were given out

Exercise

Workout the following

1. 1357

X 15

1. 1342

X 125

1. 16352

X 46

1. Find the product of 415 and 1752
2. A box contains 122 books. If I have 41218 boxes. How many books are there altogether?
3. A carton has 414870 pencils. If there are 125 cartons, how many pencils are there?

**LESSON 30**

Word problems involving multiplication

Listen and write

Product

Carton

Add

Example

Each school got 214 textbooks from the ministry of education. If there were 12456 schools, how many books were given out?

12456

X 214

49824

124560

+ 2491200

2665584

Exercise

1. Find the product of 415 and 1752
2. A carton has 414870 pencils. If there are 415 cartons. How many pencils are there?
3. A jar has 8145 sweets. If there are 415 cartons. How many sweets are there?
4. A piece of cloth costs shs 41250 per metre. If I buy 214 metres. How much do I pay?
5. A box contains 122 books. If I have 41218 boxes, how many books were there altogether?

**LESSON 31**

Dividing whole numbers by 2 digit numbers

Listen and write

Divide

Share

Quotient

Example

1. Divide 29880 by 24

Re-arrange for long division

01245

24 29880

-24

58

-48

108

-96

120

-120

1. The government gave 42984 mosquito nets to 12 districts as a way of preventing malaria. How many nets did each district get?

03582

12 42984

-36

69

-60

98

-96

24

-24

**Exercise**

1. 52 76960
2. 15 44850
3. 24 16824
4. 25 89500
5. Share 24000 books equally among 24 schools. How many books does each school get
6. Ministry of heath equally distributed 45000 mosquito nets in 90 districts. How many did each district get?
7. A shoe company packed 62500 pairs of shoes in 25 containers. How many shoes did each container get?

**LESSON 33**

**Mixed operation using BODMAS**

Listen and write

Brackets

Of

Divide and multiply

Example

1. Work out 14+6-12

First re-arrange them

14+6-12

20-12

Now subtract

20-12=8

1. Workout ½ of 30 + 10/5

First work out “of”

(½ of 30) + 10/5

15+ (10/5)

Then divide 10/2 = 2

=15 + 2

Finally add

15 + 2 = 17

1. Work out 24- (3x4) /2

First remove brackets

3x4 = 12

24- (12/2)

Then divide 12/2= 6

24-6

Finally subtract

24-6 = 18

**Exercise**

1. 11-12+9
2. 3-7+13
3. 8-7+15
4. 1/3 of 12 + 16-4
5. 18- (2x6) /3
6. 20-(8x3) /6
7. (15+10)/5
8. 48/(2x4)x5

**LESSON 34**

**Application of addition, subtraction, multiplication and division**

**Listen and write**

Addition

Division

Subtraction

More

**Example**

Akide got 16 litres of milk from her cow in the morning and sold 14 litres. The milk she got in the evening was ½ of what she got in the morning. How much milk did she have at the end of the day?

16-14 + ½ of 16

First workout “of” 1/2x16= 8

16-14+8

Rearrange then add

16+8-14

Finally subtract

24-14 = 10

Akide had 10 litres of milk at the end of the day.

Exercise

1. Read and work out

Kobusingye bought 4 boxes of soap, each containing 25 bars and sold 80 bars. She later bought 2 more boxes of 25 bars each. How many bars did she have by the end of the day?

1. Mary sold 5 bunches of matooke at shs 8500 each and bought 2kg of sugar at shs 2800 per kg and a bar of soap at shs 3500. How much was left?
2. Kalazi shared shs 4500 equally among 3 children for their transport. Their mother later shared shs 5700 equally among the same 3 children for their lunch. How much did each get?

**LESSON 35**

**Theme : numeracy**

**Topic : number patterns and sequences**

Divisibility test of 2

Listen and write

Divisibility

Sequence

Pattern

Digits

**Example**

Choose numbers which are divisible by 2 from the following

490, 561, 682, 833, 714, 205, 136, 117, 158

The numbers ending with even digits 0,2,4,6,7 are divisible by 2

**Exercise**

1. 0,1,2,3,4,5,6,7,8,9
2. 10,11,12,13,14,15,16,17,18,19
3. 30,31,32,33,34,35,36,37,38,39
4. 50,51,52,53,54,55,56,57,58,59
5. 100,101,102,103,104,105,106,107,108,109
6. 430,521,663,634,755,866,907,998
7. 1230,3041,4682,9996,2465,4089

**LESSON 36**

**Divisibility test of 3**

**Listen and write**

Sum

Digits

Total

Add and multiple

**Example**

1. State whether 144 is divisible by 3

Sum of the digits

1+4+4 = 9

9 is divisible by 3

So 144 is divisible by 3

1. Which of the numbers 255, 743, 984 is not divisible by 3

255= 2+5+5 = 12 (divisible by 3)

745=7+4+5 =14 (not divisible by 3)

984=9+8+4 =21 (divisible by 3)

So 743 is not divisible by 3

**Exercise**

Write the numbers divisible by 3 from the numbers below

1. 0 1 2 3 4 5 6 7 8 9
2. 10 11 12 13 14 15 16 17 18 19
3. 30 31 32 33 34 35 36 37 38 39
4. 40 41 42 43 44 45 46 47 48 49

**LESSON 37**

Divisibility test for 5

Listen and write

Divisible

Multiples

Missing

**Example**

1. Which of the following numbers are divisible by 5

12, 15, 20, 34, 35

They are 15, 20 and 35 because they end with 0 or 5

1. Write the numbers between 19 and 37 which are divisible by 5

Numbers between 19 and 37 are:

20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36

Those that are divisible by 5 are 20, 25, 30, 35

Exercise

1. Write down numbers divisible by 5 or multiple of 5

5 10 15 20 30

1. List the multiples of 5 between 59 and 101

(60 70 80 , 95 )

1. List the missing multiples of 5

(15, 125, 135, , , 150, )

1. List the missing multiples of 5

(170, 180, 190, 200, , 210, 220 )

1. Which of the following are divisible by 5
2. 302
3. 503
4. 700
5. 435

**LESSON 38**

**Identifying, counting and whole number**

**Listen and write**

Whole numbers

Counting numbers

Zero

Natural

**Example**

A set of counting numbers including zero is a set of whole numbers.

Whole numbers={0,1,2,3,4,5,6,7,8,9…}

From whole numbers we can obtain a set of natural/ counting numbers.

Counting numbers and natural numbers are the same

Counting numbers ={1,2,3,4,5,6,7,8,9,10,11,12,13…}

E**xercise**

1. Give a set of counting numbers from 5 to 11?
2. Write a set o first five whole numbers?
3. List a set of counting numbers from 15 tom 24?
4. Write a set of counting numbers between 20 which are divisible by 3
5. What is the largest number that you can write with the following digits
6. What is the smallest

**LESSON 39**

**Identifying even and odd numbers**

Listen and write

Double

Odd

Even

Example

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Whole number | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Multiples given number by 2 |
| 0x2 | 1x2 | 2x2 | 3x2 | 4x2 | 5x2 | 6x2 | 7x2 | 8x2 |
| Even numbers | 0 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 2xn = 2n |
| 0+1 | 2+1 | 4+1 | 6+1 | 8+1 | 10+1 | 12+1 | 14+1 | 16+1 |
| Odd numbers | 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 17 | 2n + 1 |

When a whole number is multiplied by 2 (doubled)

You get an even number

A set of even numbers = {0,2,4,6,8,10,12…}

When a whole number is multiplied by 2 and 1 is added to the product an odd number is obtained.

Exercise

Work out

1. Complete 0,2,4,6,8,….., ……
2. What is the first even numbers?
3. List a set of even number below 20
4. List a set of odd numbers between 8 and 30
5. List a set of even numbers which are both divisible by 2 and 3 between 10 and 30
6. List a set of odd numbers greater than 4 but less than 20
7. Find the sum of odd numbers between 8 and 25

**LESSON 40**

**Square numbers and their sequencies**

Listen and write

Square

Product

Sequencies

Arrangement

Examples

1. Write the first 3 square numbers. The first 3 square numbers are;

1x1 = 1

2x2 =4

3x3 =9

1. Find the squares of 4567

4x4 =42 =16

5x5 =52 =25

6x6 =62 =36

7x7 =72 =49

1. Find the missing numbers

1 4 9 16 25

1. Find the next arrangement

1+2+1 = 4

1+2+3+2+1 = 9

1+2+3+4+3+2+1 =16

Exercise

Work out

1. Find the value of the unknown:
2. 1x1 = a
3. 2x2 = k
4. What is the square of;
5. 11
6. 12

Find the value of

1. 82
2. 92
3. 102

Complete the sequence 1 4 9 25 36 49 …….. ……..

**LESSON 41**

**Squares of fractions (proper, decimal and mixed)**

**Listen and write**

Proper

Decimal

Mixed

Improper

Example

1. Find the square of ½

½ x ½ = 1/4

1. Find the square of 5/8

5/8 x 5/8 = 25/64

1. Find the square of 1⅕

Change 1⅕ to an improper fraction

1⅕ = (1x5) + 1

5

=6/5

Its square = (6/5)2  =6/5 x 6/5

=36/25

Exercise

Find the squares of each of the following

1. ⅓
2. ⅔
3. 2/9
4. ⅕
5. 1½
6. 3¼
7. Workout 3 ¼ x 3 ¼
8. Simplify 7 ½ x 7 ½
9. Find the area of a square piece of land whose side is 4 ¼ kilometres

**LESSON 42**

Finding square roots using prime factorization

Listen and write

Remainder

Ladder

Factorization

Square

Example

1. Find the square root of 64 using ladder method

2 64

2 32

2 16

2 8

2 4

2 2

1

64 = 2x2x2x2x2x2

= 2x2x2

=8

The square root of 64 is 8

1. Find the square root of 100

2 100

2 50

5 25

5 5

1

100 = 2x2x5x5

=2x5

= 10

Exercise

Use the prime factorization method to find the square root of

1. 36
2. 361
3. 400
4. 441
5. 144
6. 625
7. 324

**LESSON 43**

**Find the square root of fractions**

**Listen and write**

Fractions

Denominator

Square

Numerator

Example

1. Find the square root of 1/9

1/9 = 1x1

3x3

= 1/3

1. Find the square root of 1/16

1/16 = 1x1

4x4

=1/4

1. Find the square of 6 ¼

Find the square root of the numerator and that of the denominator separately

6 ¼ =25/4

= 5x5

2x2

=5/2

1. Find the square roots of 0.36

Change it to fraction

= 36/100 2 36 2 100

2 18 2 50

3 9 5 25

3 3 5 5

1

= 2x2x3x3

2x2x5x5

= 2x3

2x5

=6/10

=0.6

**LESSON 45**

Prime factorization

Listen and write

Power

Notation

Prime

Example

Find the prime factors of 54

Factor tree

54

2 27

3 9

3 3

3 1 54= 2x3x3x3

Ladder

2 54

3 27

3 9

3 3

1. 54= 2x3x3x3

=21 x 33

Exercise

Express 54 as a product of its prime factors

Prime factorise 84, 280 and given your answer in

1. Notation form
2. Power form

**LESSSON 46**

**Listen and write**

Unknown

Factors

Factorization

Multiples

Example

1. The prime factors of 60 are 2x2xPx5. Find the value of P

2 60

2 30

3 15

5 5

1. 2x2x3x5 = 60

2x2xpx5 = 60

P =3

The prime factorization of 30 is 2 x X x 5. What is the value of X

2 30

3 15

5 5

2 x 3 x 5 = 30

2 x X x 5 = 30

Then X = 3

**Exercise**

1. The prime factorization of 70 is 2 x 5 x n. what is the value of n?
2. The prime factorization of 100 is 22 x K. what is the value of K?

**LESSON 47**

Representing prime factors on a venn diagram.

Listen and write

Factors

GCF

LCM

Prime

Example

Study the venn diagram below and answer questions that follow

X Y

23 21 23 3 32 33

Find the value of X

X= {21 22 23 31}

=2x2x2x3

=8x3

=24

Find the value of Y

Y= {22 21 31 32 33}

Y= 2x2x3x3x3

=6x6x3

=108

Find the GCF of X and Y

GCF = fx n fy

Fx n fy =21 31 22

=2x3x2

=6x2

=12

Find the LCM of X and Y

LCM = fx u fy

Fx u fy ={23 21 33 22 32 3}

=2x2x3x2x3x3

LCM = 216

Activity

F12 F18

Y2 21 Y2

31

1. Find the value of X
2. Find the value of Y
3. Find the LCM of 12 and 18
4. Find the GCF of 12 and 18

**LESSON 48**

**Finding LCM and GCF using prime factorization**

**Listen and write**

**Factorization**

**LCM**

**GCF**

Example

Find LCM of 8 and 9

2 8 9

2 4 9

2 2 9

3 1 3

1

LCM = 2x2x2x3

= 72

Find the GCF of 64 and 80

2 64 80

2 32 40

2 16 20

2 8 10

2 4 5

GCF = 2x2x2x2

=16

Exercise

1. Find the GCF of 24 and 28
2. First find the LCM of 9 and 12 and thereafter add five to the LCM
3. Find the LCM (lowest common multiple) of the following
4. 8 and 12
5. 15 and 18
6. 18 and 30
7. Find the GCF of the following pairs of numbers
8. 24 and 64
9. 18 and 45
10. 20 and 24

**LESSON 49**

**Finding unknown values in a venn diagram.**

**List and write**

Unknown

Values

Equations

Example

1. Look at the venn diagram below

Fk Fx

7 21  2 3

Find the value of X and K

2x2x3x = 60

12=60

= 5

Therefore the value of is 5

x2x7 = K

5x2x7 =k

7 =k

1. Use the venn diagram to answer the question that follow
2. Find the value of X and Y

Fx Fy

51 21 23

31 22  32

**LESSON 50**

Find the value of X and Y

1. F 90 FY

32 22 23

1. F 84 FX

21 22 32 Y 3

1. FY FX

7

72 21 22 3