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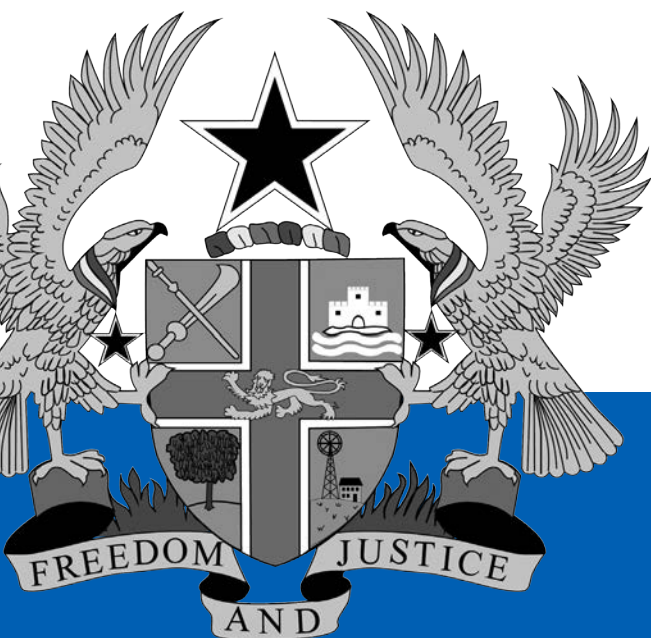


GHANA EDUCATION SERVICE

Differentiated Learning (DL)

*Mathematics Teachers Guide
for Upper Primary*

Basic 4~6



NOVEMBER, 2020

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ISBN XXX-XXXX-XXXX-X-X

Acknowledgement

The Ministry of Education (MoE) and the Ghana Education Service (GES) gratefully acknowledge the immense contribution of the following people for the successful development of the DL teacher's guide.

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UNICEF for funding the development of the DL Teacher's Guides and readers, and the UNICEF Education Team, especially Agnes Arthur and Kevin Kouami Sery, for technical support.

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ACKNOWLEDGEMENT

This Teachers Guide is a result of the collaborative effort between Ghana Education Service (GES) and its partners. In a special way, GES would like to thank its partners for working tirelessly to support implementation of Ministry of Education priorities. We wish to thank various organizations for their dedicated support to Differentiated Learning initiatives.

Special thanks to the team of content developers for writing and updating this Guide, to UNICEF, IPA and Right to Play for supporting this work. We are grateful to the literacy and numeracy experts from Colleges of Education, Senior High Schools, Non-Governmental Organizations, the staff of Metropolitan, Municipal and District Education offices of the Ghana Education Service for the various roles they played in the successful development of the materials.

Many partners have played critical roles in the Differentiated Learning Intervention programme. The World Bank and UNICEF, in particular, have supported the teacher continuous professional development efforts of GES and this partnership has been indispensable in implementing the DL Programme.

Sincere thanks go to the Schools and Instructions Division of the GES for working around the clock to get this project running within the stipulated time frame. This acknowledgment will not be complete without special recognition for the project team of the Strengthening Teacher Accountability to Reach all Students (STARS) with support from UNICEF and IPA. The Differentiated Learning approach is an up-scale of STARS Targeted Instruction programme.

One purpose of this programme is to ensure that Ghanaian learners have the required skills to make them useful citizens to the Ghanaian society and the world at large. It is always important to remember that we reach the Ghanaian child through the teacher. So our commitment to support teacher development and the education system should be targeted at the teacher and learner.

FOREWORD

The Differentiated Learning (DL) programme seeks to give remediation to learners in Ghanaian primary schools by embedding teacher-led differentiated learning within the existing government structure. The programme focuses on equipping teachers with the requisite knowledge and skills to be able to support Basic Two to Basic Six learners who are struggling with English Language and Mathematics. It is also to help learners acquire basic skills in these subjects.

This is achieved by developing differentiated learning instructional materials and training teachers to teach learners at their level to reduce the gap between their knowledge and the learning standards of the National Council for Curriculum and Assessment (NaCCA) curriculum for literacy and numeracy.

The Ministry of Education (MoE) and the Ghana Education Service (GES) are grateful to UNICEF and IPA for this innovative approach to equip teachers to teach at the level of the learner. This will help learners in the targeted grades who are performing below their grade levels in English and Mathematics acquire the needed foundational skills to enable them to perform at grade level.

.....

Prof. Kwasi Opoku-Amankwa
(Director-General, Ghana Education Service)

LIST OF ABBREVIATIONS

BED	Basic Education Division
DL	Differentiated Learning
GALOP	Ghana Accountability for Learning Outcomes Programme
GES	Ghana Education Service
IPA	Innovations for Poverty Action
MoE	Ministry of Education
NaCCA	National Council for Curriculum and Assessment
NASIA	National Schools Inspectorate Authority
NTC	National Teaching Council
RPK	Relevant Previous Knowledge
STARS	Strengthening Teacher Accountability to Reach all Students
UNICEF	United Nations International Children's Emergency Fund

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INTRODUCTION TO DIFFERENTIATED LEARNING (DL)

DL is a programme that seeks to bridge the learning gaps among learners by creating opportunities for learners to learn at their pace. The programme provides remediation for learners who are lagging on their grade level proficiency while giving opportunity to those who are at par with the grade level curriculum to learn at a different pace to improve their literacy and numeracy skills. DL is delivered for English Language and Mathematics. DL is a holistic approach that helps to improve foundational skills.

Implementing DL in schools begins with assessing learners and grouping them into three different learning ability levels and teaching them according to those levels for 1-hour in a day, 2-hours in a week for a subject (English/Mathematics) and 8 weeks in a term.

Learners' proficiency levels are monitored over time and wherever they show signs of improvement, they are re-assessed and placed at higher levels where necessary. This means that at every point in time, learners are given the opportunity to learn at their own level and not at the grade level.

More information about the classroom methodology, teaching approach/ delivery processes as well as resources that supports implementation of DL in schools are provided in the DL Implementation Guide & Resource Packet.

Overview of the DL Mathematics Teachers Guide and Activity Book (TG)

The DL Teachers Guide provides the approaches and methods to be used in presenting the DL lesson and the corresponding activities that are expected to be performed in a DL class. The English Teachers guide for each level has 16 lessons for each term (2 lessons per week expected to be taught over 2 days per week and 8 weeks per term). Each lesson lasts for one hour a day.

The teacher has the flexibility to manage the time to cover all aspects of the lesson. At each level, the Teachers Guide is intended to assist the teacher to identify and engage underperforming learners in a variety of ways using the materials so that Learners can improve on their literacy and numeracy skills. The TG also outlines activities for advance learners (learners who are at par with the grade level curriculum).

For each DL class, the lessons must involve **whole class demonstration activities, pairs/ group activities, and individual activities**. There are instructions for directing teachers to do this. The Activity Book contains a detailed explanation of language games and strategies that have been used in the teacher's guide.

Module 2

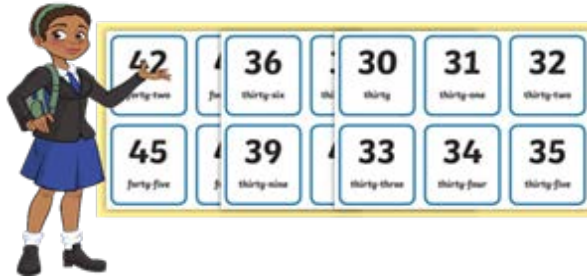
(Eight Week's Lessons)

Module 2 - Week One (Lesson 1)



Big Idea

Number names, numeral recognition, and counting sequence



Learning Outcomes

Count objects between 0 and 999

Identify and recognize numbers between 0 and 999

Read numbers/numerals between 0 and 100



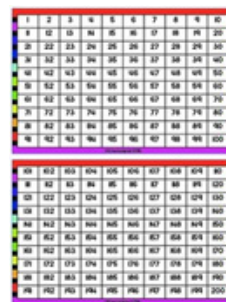
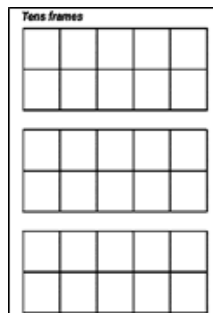
Key Words

Number, how many, count, bundle, tens, ones, loose, group of tens, hundreds



Materials

Straws, number frame and number chart (1-1,000)





Teaching Procedure

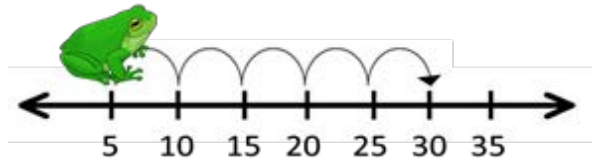
Mental Activity (5 minutes)

Have learners play “Thinking of a number -Tens and Ones” game (M1)



Reinforcement (5 minutes)

Have learners play “Skip Count in 5s, 10s, 20s...” game



Learning Activity (20 minutes)

Learners make bundles and loose ones to represent a given number. **(Activity 1B)**



Reflection/Plenary

Engage learners with reflective questions.

Self-Practice

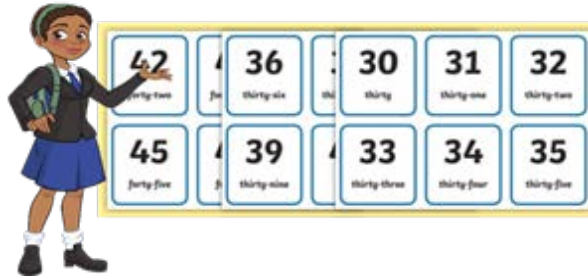
Refer to workbook page.

Module 2 - Week One (Lesson 2)



Big Idea

Number names, numeral recognition, and counting sequence



Learning Outcomes

Count objects between 0 and 999

Identify and recognize numbers between 0 and 999

Read numbers/numerals between 0 and 100



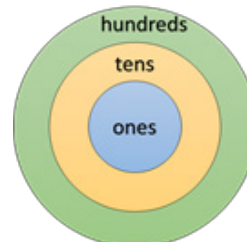
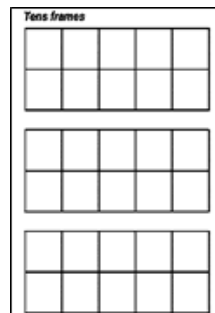
Key Words

Number, how many, count, bundle, tens, ones, loose, group of tens, hundreds



Materials

Straws, Number frame, Place value chart (1,000) and Place value Disc

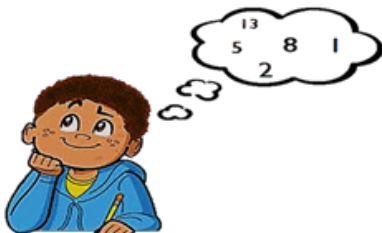




Teaching Procedure

Mental Activity (5 minutes)

Have learners play “Thinking of a number -Tens and Ones” game (M1)



Reinforcement (5 minutes)

Say a number and have learners mention “How many tens and how many ones” there are.

Learning Activity (20 minutes)

Display the number chart 1 – 1,000 on the board and have learners practice number reading up to 999. **(Activity 3B)**

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

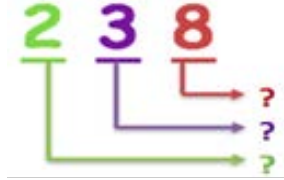
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Module 2 - Week Two (Lesson 1)



Big Idea

Place value of 3-digit numbers



Learning Outcomes

Tell the place value of a digit in a 3-digit number



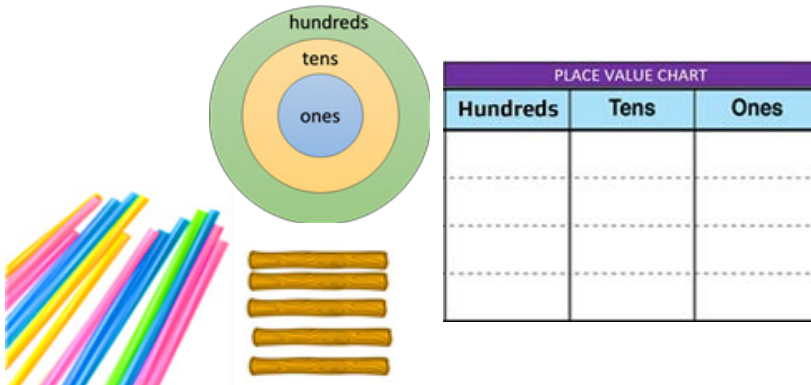
Key Words

Place value, place, position, number, 3-digit, hundreds, tens, ones,



Materials

Straws/sticks, place value frame or mat (100). Place values Disc (1, 10, 100, 1000), strings and transparent plastic containers





Teaching Procedure

Mental Activity (5 minutes)

Learners play "Thinking of a number" game (M1)



Reinforcement (5 minutes)

Learners play "Who am I?" game with numbers which have tens and ones. Learners write the answers in their jotters or exercise books. (M7)

I am a number.
I have 5 tens and 2 ones.
Who am I?



Learning Activity (35 minutes)

Learners make bundles of hundred and ten, and loose ones to represent a given number and place them at the appropriate positions on the place value frame.

(Activity 4B).

Hundreds	Tens	Ones

243

Learners represent given numbers in Hundreds, Tens and Ones pictorially, symbolically and kinesthetically.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

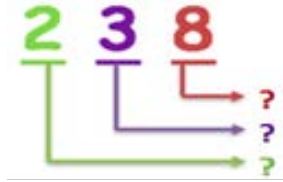
Refer to workbook page.

Module 2 - Week Two (Lesson 2)



Big Idea

Place value of 3-digit numbers



Learning Outcomes

Identify the place value of a digit in a 3-digit number



Key Words

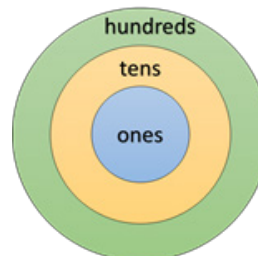
Place value, place, position, number, digit, hundreds, tens, ones,



Materials

100s number wheel, place value frame/mat/chart, pebbles and place value discs

PLACE VALUE CHART		
Hundreds	Tens	Ones





Teaching Procedure

Mental Activity (5 minutes)

Learners play “Doubles” game (M3)

$$3 + 3 = 6$$

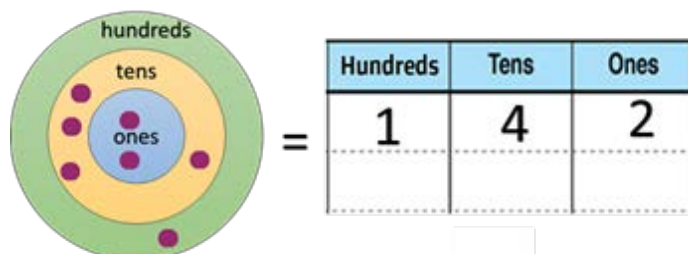
Reinforcement (5 minutes)

Play “Base-Ten Riddles” game with learners (M6)

Learning Activity (25 minutes)

In groups, have learners use the “Number Wheel” to determine the place value of digits in a 3-digit number (**Activity 5B**).

Learners play “Number Wheel” game in groups and record their numbers to determine their place value.



Learners represent number played pictorially, symbolically and kinesthetically.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 2 - Week Three (Lesson 1)



Big Idea

Comparing and Ordering 3-digit numbers



620	__	126		148	__	710



Learning Outcomes

Compare given two 3-digit numbers using $<$ or $>$



Key Words

Greater than, less than, equal to, hundreds, tens, ones, how many more, how many less



Materials

Place value discs, straws/sticks and place value frame/mat/chart

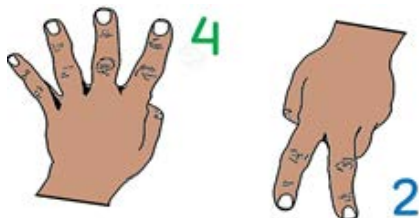
PLACE VALUE CHART		
Hundreds	Tens	Ones



Teaching Procedure

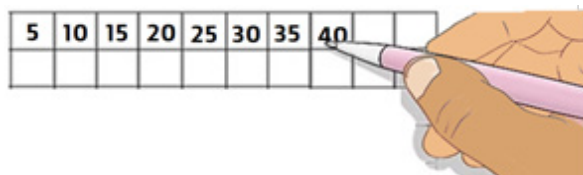
Mental Activity (5 minutes)

Learners play “How many fingers up/down” game (M9)



Reinforcement (5 minutes)

Learners write numbers in 5s, starting from 5 to 40 sequentially.



Learning Activity (25 minutes)

Learners to make bundles of ten and loose ones to represent any two 3-digit given numbers and compare them using $<$ or $>$ taking into consideration the place value of the numbers being compared.

(Activity 5B)

Learners compare and order numbers using less than ($<$) and greater than ($>$) and equal to ($=$). E.g. 250.....205.

Reflection/Plenary

Engage learners with reflective questions.

Self-Practice

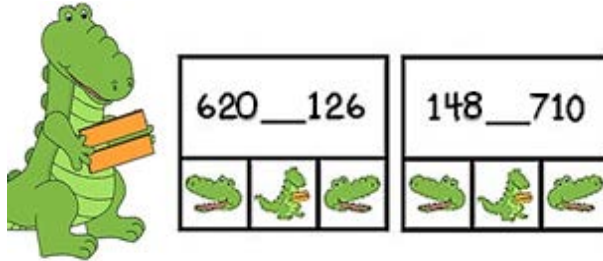
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Module 2 - Week Three (Lesson 2)



Big Idea

Comparing and Ordering 3-digit numbers



Learning Outcomes

Compare given two 3-digit numbers using $<$ or $>$



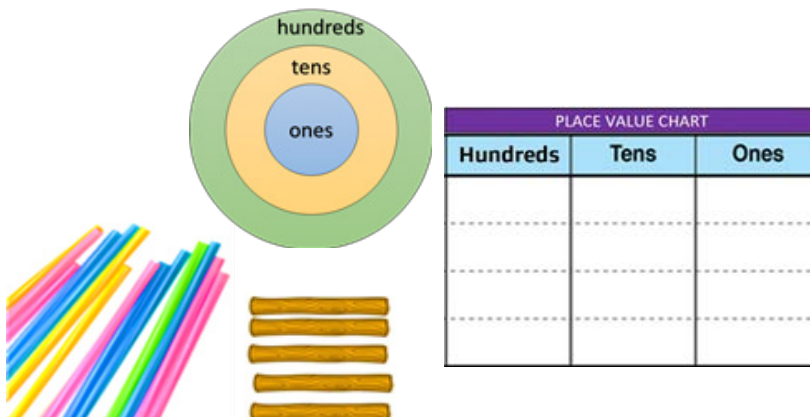
Key Words

Greater than, less than, equal to, compare, order, tens, ones, hundreds,



Materials

Straws/sticks and place value frame





Teaching Procedure

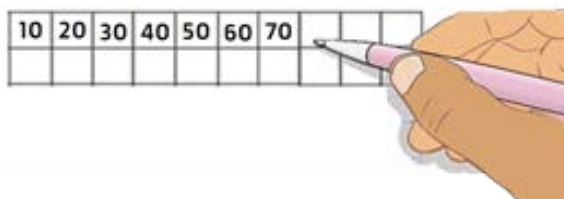
Mental Activity (5 minutes)

Have learners play “Thinking of a number” game (M1)



Reinforcement (5 minutes)

Learners write numbers in 10s starting from 10 to 200 sequentially.



Learning Activity (25 minutes)

Learners play “Number Wheel” game to compare given 3-digit numbers using $<$ or $>$, taking into consideration hundreds, tens and ones. (**Activity 5B**)

Have learners order numbers using less than ($<$) and greater than ($>$) e.g. 270..... 240 into their jotters.



Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 2 - Week Four (Lesson 1)



Big Idea

Addition of two 2-digit numbers



Learning Outcomes

Add two 2-digit numbers with sum up 99



Key Words

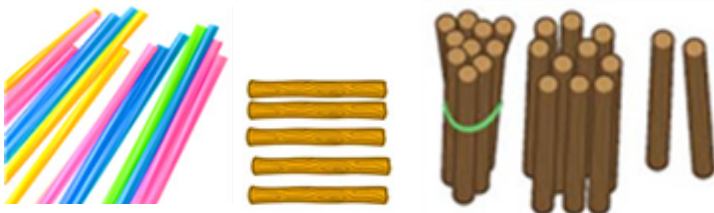
Add, sum, altogether, how many more?



Materials

Straws/sticks (bundles of ten and loose ones), addition mat/ frame and place value disc

	Hundreds	Tens	Ones
+			
=			





Teaching Procedure

Mental Activity (5 minutes)

Play "One more/less, two more /less..." games (M8)

two less		number		one more
18	←	20	→	21
	←		→	
	←		→	

Reinforcement (5 minutes)

Give learners some straws to make bundles of hundred, ten and loose ones



Hundreds	Tens	Ones
1	2	5

Learning Activity (25 minutes)

Learners solve addition problems involving two 2-digit numbers using bundles of ten straws and loose straws. For example, $21 + 43$, $45 + 23$ etc. (**Activity 6B2**)

Learners demonstrate solving addition tasks using the straws/sticks and addition frame.

Learners solve more problems in their exercise books using "Addition frame" E.g. $51 + 28$; $14 + 39$; $48 + 18$ etc.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 2 - Week Four (Lesson 2)



Big Idea

Addition of two 2-digit numbers



Learning Outcomes

Add two 2-digit numbers with sum up 99



Key Words

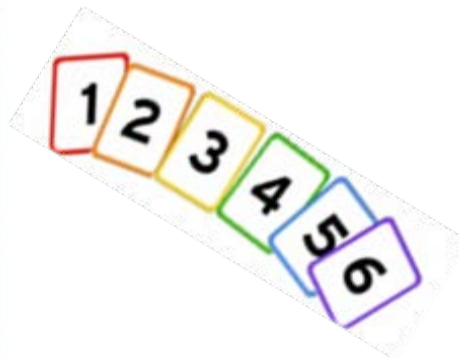
Add, sum, altogether, total



Materials

Number chart and number cards

Numbers 1-100									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100





Teaching Procedure

Mental Activity (5 minutes)

Play "One more/less, two more /less..." game (M8)

two less		number		one more
18	←	20	→	21
	←		→	
	←		→	

Reinforcement (5 minutes)

Mention a number for learners to point to on the number chart.

Learning Activity (40 minutes)

Learners solve addition problems involving two 2-digit numbers using "Number Chart". For example, $32 + 17$, $60 + 29$. **(Activity 7B)**

Have learners demonstrate solving addition tasks involving two 2-digit numbers using the number chart.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

$$24 + 5 = 29$$

Have learners demonstrate solving addition tasks involving two 2-digit numbers using the number chart.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 2 - Week Five (Lesson 1)



Big Idea

Subtraction of two 2-digit numbers



Learning Outcomes

Subtract two 2-digit numbers



Key Words

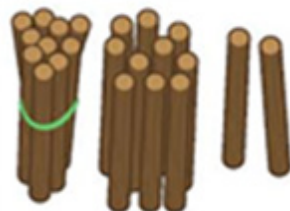
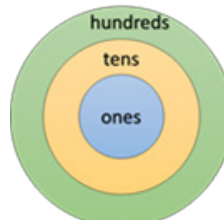
Subtract, take-away, less, minus, how many left? Tens, Ones



Materials

Straws/Sticks (bundles of ten and loose ones), Subtraction Frame/mat and place value discs

	Tens	Ones
-		
=		





Teaching Procedure

Mental Activity (5 minutes)

Play “Doubles/doubles plus one” game (M3) (M4)

$$3 + 3 + 1 = 7$$

Reinforcement (5 minutes)

Play “Numbers in Equivalent Ways” game with learners (M2)

Learning Activity (40 minutes)

Learners solve subtraction problems involving two 2-digit numbers using bundles of ten straws and loose ones, and subtraction frame. **(Activity 10B)**

Learners demonstrate solving subtraction tasks using the subtraction frame.

	Tens	Ones
—		
=		

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

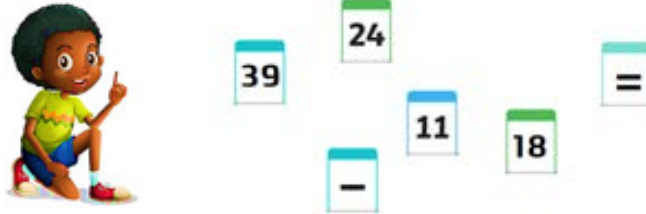
Refer to workbook page.

Module 2 - Week Five (Lesson 2)



Big Idea

Subtraction of two 2-digit numbers



Learning Outcomes

Subtract two 2-digit numbers



Key Words

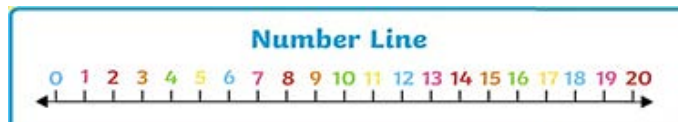
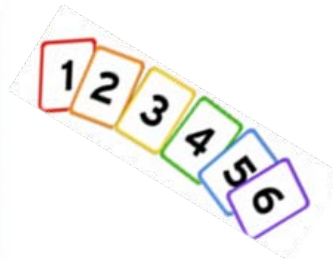
Subtract, minus, less, take-away, how many left



Materials

Number chart, number cards and number line

Numbers 1-100									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100





Teaching Procedure

Mental Activity (5 minutes)

Play “One more or less, two more or less” game (M8)



Reinforcement (5 minutes)

Have learners point a given 2-digit number on number chart.

Learning Activity (40 minutes)

Learners solve problems involving subtraction of 2-digit numbers from other 2-digit numbers using Number Chart. For example, $88 - 55$; $45 - 23$. **(Activity 11B).**

Have learners demonstrate solving subtraction tasks using the “Number Chart”

Learners solve problems involving subtraction of two 2-digit numbers using friendly jumps on the number line

	Tens	Ones
	7	8
–	2	5
=	5	3

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 2 - Week Six (Lesson 1)



Big Idea

Multiplication of a 2-digit number by a 1-digit number



Learning Outcomes

Multiply a 2-digit number by a 1-digit number.



Key Words

Multiply, product, lots of, groups of



Materials

Straws/sticks, pebbles, bottle tops and multiplication chart

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

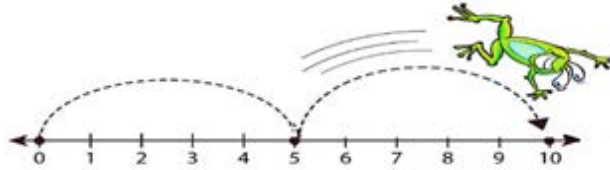




Teaching Procedure

Mental Activity (5 minutes)

Play "Skip count by 5s..." game (M5)



Reinforcement (5 minutes)

Have learners play "Base ten riddles" game. (M6)

Learning Activity (25 minutes)

Learners multiply 2-digit numbers by 1-digit numbers using grouping of object (**Activity 14B**).

Write multiplication word problems involving two 2-digit numbers by 1-digit number and have learners solve them.



Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 2 - Week Six (Lesson 2)



Big Idea

Multiplication of a 2-digit number by a 1-digit number



Learning Outcomes

Multiply a 2-digit number by a 1-digit number.



Key Words

Multiply, product, lots of, groups of



Materials

Multiplication chart and A4 sheets

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

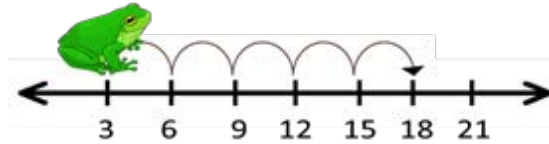




Teaching Procedure

Mental Activity (5 minutes)

Learners do "Skip count by 3s, 6s, 8s..."



Reinforcement (5 minutes)

Have learners play "Base ten riddles" game. (M6)

Learning Activity (40 minutes)

Have learners multiply 2-digit numbers by 1-digit numbers using multiplication chart (**Activity 16B**).

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 2 - Week Seven (Lesson 1)



Big Idea

Multiply 2-digit numbers by 1-digit numbers



Learning Outcomes

Multiply a 2-digit number by a 1-digit number



Key Words

Multiply, groups of, lots of, product



Materials

Pencils, A4 sheets, ruler and multiplication chart

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144





Teaching Procedure

Mental Activity (5 minutes)

Play “Base Ten Riddles” games (M6)

Reinforcement (5 minutes)

Have learners do skip count in 2s and 4s starting from a number between 1 and 50

counting by fours									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

Learning Activity (40 minutes)

Learners multiply 2-digit numbers by 1-digit numbers using the box method (**Activity 17; B1**).

Reflection/Plenary

Engage learners with reflective questions.

Self-Practice

Refer to workbook page.

Module 2 - Week Seven (Lesson 2)



Big Idea

Multiply 2-digit numbers by 1-digit numbers



Learning Outcomes

Multiply a 2-digit number by a 1-digit number



Key Words

Multiply, groups of, lots of, product



Materials

Straws/sticks, bottle caps and transparent empty containers

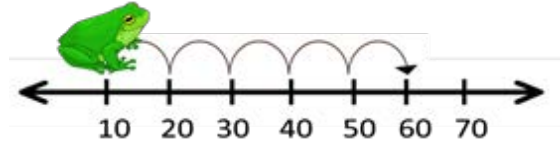




Teaching Procedure

Mental Activity (5 minutes)

Play “Skip count in 10s” game (M5)



Reinforcement (5 minutes)

Invite 2 or 3 learners and give out a handful of straws to them to share and observe how they do the sharing.

Learning Activity (40 minutes)

Learners multiply 2-digit numbers by 1-digit numbers using the box method (**Activity 17; B2**).



Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 2 - Week Eight (Lesson 1)



Big Idea

Division of 2-digit numbers by a 1-digit number

Sharing
Grouping



Learning Outcomes

Divide a 2-digit number by a 1-digit number



Key Words

Divide, groups of, groups, sharing, lots of, share



Materials

Straws/Sticks (bundle of tens and loose ones) and beads/pebbles





Teaching Procedure

Mental Activity (5 minutes)

Learners play “Skip count in 4s, 6s, 8s” game.

counting by fours									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

Reinforcement (5 minutes)

Give learners some straws/beads to form groups and make equal formation.

Learning Activity (40 minutes)

Have learners divide 2-digit numbers by 1-digit numbers using division by grouping (**Activity 19B**).

Write division sentences involving two 2-digit and 1-digit numbers and have learners create word sentences for it.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 2 - Week Eight (Lesson 2)



Big Idea

Division of 2-digit numbers by a 1-digit number

Sharing
Grouping



Learning Outcomes

Divide a 2-digit number by a 1-digit number



Key Words

Repeated subtraction, divide, groups, lots of

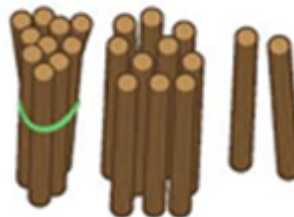


Materials

Straws/Sticks (bundles of ten and loose ones), beads/pebbles and numeral cards chart.



Numbers 1-100									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

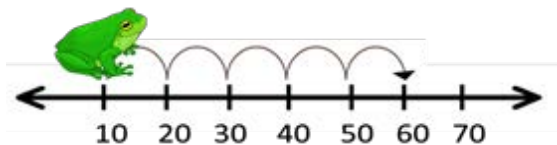




Teaching Procedure

Mental Activity (5 minutes)

Learners play “Skip count in 10s” game (M5)



Reinforcement (5 minutes)

Have learners play the “Skip count backwards in 2s” game starting from a given number less than 100 and ending on 0

For example, 26, 24, 22, 20, 18, 16, 14, 12, 10, 8, 6, 4, ...

Learning Activity (35 minutes)

Have learners divide a 2-digit number by a 1-digit number using repeated subtraction approach (**Activity 22B**).

E.g. $18 \div 3 = 6$

$18 - 3 = 15$	①
$15 - 3 = 12$	②
$12 - 3 = 9$	③
$9 - 3 = 6$	④
$6 - 3 = 3$	⑤
$3 - 3 = 0$	⑥

Write division sentences involving 2-digit numbers and 1-digit numbers and have learners create a word problem.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 3

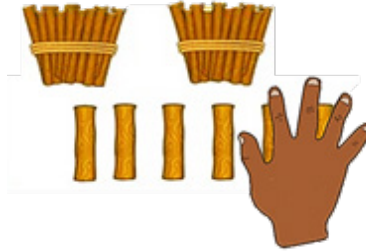
(Eight Week's Lessons)

Module 3 - Week One (Lesson 1)



Big Idea

Modelling number quantities



Learning Outcomes

Model number quantities using graph sheets.

Model number quantities using token currencies



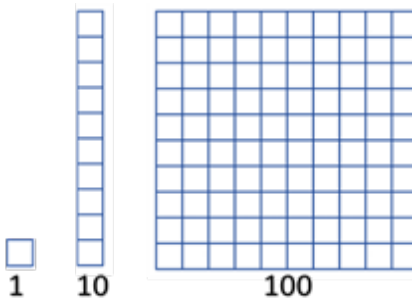
Key Words

Ones, tens, hundreds, thousands, ten-thousand, model, number quantities, currency



Materials

Graph sheets and token currencies





Teaching Procedure

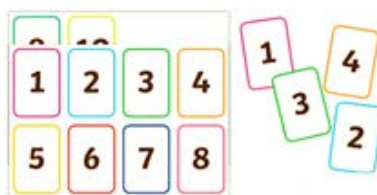
Mental Activity (5 minutes)

Learners play “Thinking of a number?” game (M1)



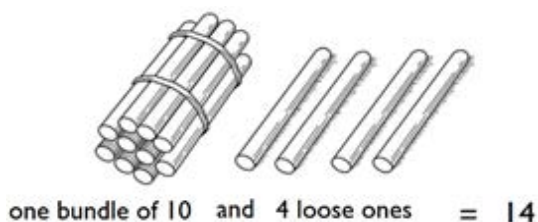
Reinforcement (5 minutes)

Randomly give number cards with numbers ranging from 1 to 1000 to learners. Learners arrange the numbers orderly in front of the class



Learning Activity (20 minutes)

Learners make bundles of hundred, ten and loose ones to represent a given number. **(Activity 1C).**



Take out the sum: $10 + 4 = 14$.

Learners play “Guess my number” game.

Reflection/Plenary

Engage learners with reflective questions.

Self-Practice

Refer to workbook page.

Module 3 - Week One (Lesson 2)



Big Idea

Number names, recognition, and counting Sequence



Learning Outcomes

Count objects between 0 and 1000

Identify and recognize numbers between 0 and 100

Read numerals between 0 and 1000



Key Words

Number name, numeral, skip count, count



Materials

Number chart (1-1,000)

Counting to 1,000 by 10s

10	20	30	40	50	60	70	80	90	100
110	120	130	140	150	160	170	180	190	200
210	220	230	240	250	260	270	280	290	300
310	320	330	340	350	360	370	380	390	400
410	420	430	440	450	460	470	480	490	500
510	520	530	540	550	560	570	580	590	600
610	620	630	640	650	660	670	680	690	700
710	720	730	740	750	760	770	780	790	800
810	820	830	840	850	860	870	880	890	900
910	920	930	940	950	960	970	980	990	1,000



Teaching Procedure

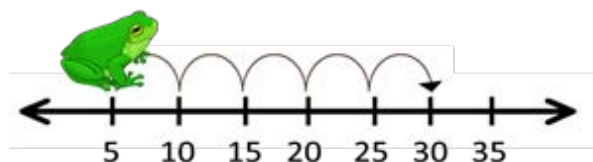
Mental Activity (5 minutes)

Learners play “Thinking of a number, Hundreds, Tens and Ones” game (M1)



Reinforcement (5 minutes)

Learners do “Skip count in 2, 5s, 10s, 20s, 25s, 50s, 100s” (M5) forward and backwards.



Learning Activity (20 minutes)

Display the number chart on the board and have learners practice number reading (**Activity 3c**).

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

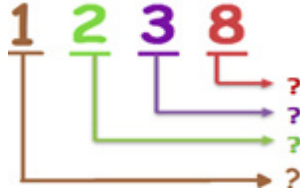
Refer to workbook page.

Module 3 - Week Two (Lesson 1)



Big Idea

Place value of a digit in 4-digit numbers.



Learning Outcomes

Tell the place value of a digit in numbers up to 4-digits



Key Words

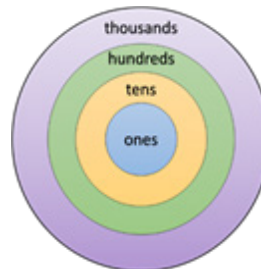
Thousands, hundreds, place value, position, digits



Materials

Place value chart, place values discs, place value frame/mat and number wheel

PLACE VALUE CHART			
Thousands	Hundreds	Tens	Ones





Teaching Procedure

Mental Activity (5 minutes)

Learners play “Who am I?” game (M7)

I am a number.
I have 5 tens and 2 ones.
Who am I?



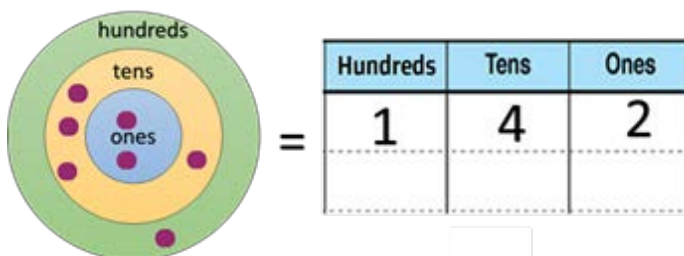
Reinforcement (5 minutes)

Play “ten more, ten less, ...” game (M8) with learners



Learning Activity (40 minutes)

Learners play the number wheel game and represent the number played pictorially, symbolically and kinesthetically. (Activity 5C).



Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

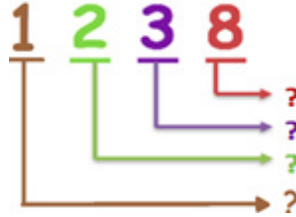
Refer to workbook page.

Module 3 - Week Two (Lesson 2)



Big Idea

Place value of a digit in 4-digit numbers.



Learning Outcomes

Tell the place value of a digit in 4-digit numbers



Key Words

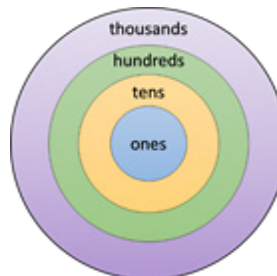
Thousands, hundreds, place value, position, digits



Materials

Number wheel and place value frame

PLACE VALUE CHART			
Thousands	Hundreds	Tens	Ones

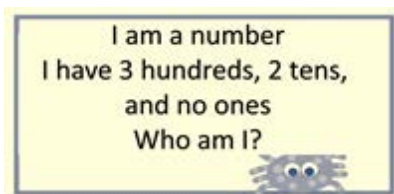




Teaching Procedure

Mental Activity (5 minutes)

Learners play “Who am I?” game (M7)



Reinforcement (5 minutes)

Play “One more, One less, two more, two less...” game (M8) with learners



Learning Activity (40 minutes)

Learners create their own numbers and write the digits under the appropriate column on the place value chart.

At any point in time, learners randomise their numbers.

(5C 1.2)

Thousands	Hundreds	Tens	Ones
3	0	4	8

3,048

3 thousands, 0 hundreds, 4 tens 8 ones

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 3 - Week Three (Lesson 1)



Big Idea

Comparing 4-digit numbers



1024 ____ 2041	7516 ____ 7417
	



Learning Outcomes

Compare two 4-digit numbers using < or >



Key Words

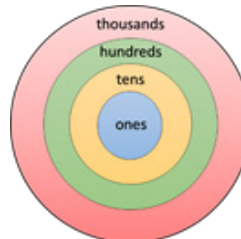
Compare, order, greater than, less than, thousands, hundreds, tens, ones



Materials

Number wheel, place value discs and place value mat/frame

PLACE VALUE CHART			
Thousands	Hundreds	Tens	Ones





Teaching Procedure

Mental Activity (5 minutes)

Learners play “Thinking of a number” game (M1)



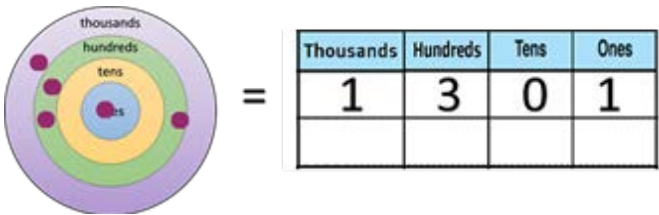
Reinforcement (5 minutes)

Learners mention numbers in multiples of 100 starting from 1,200 to 9,200

Learning Activity (40 minutes)

Learners play the number wheel game and represent the number they played in multiple ways.

Learners compare and order their numbers played in ascending and descending order (**Activity5C 1.1**)



Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 3 - Week Three (Lesson 2)



Big Idea

Comparing and ordering 4-digit numbers



1024 ____ 2041	7516 ____ 7417
  	  



Learning Outcomes

Compare two 4-digit numbers using $<$ or $>$ or $=$



Key Words

compare, order, greater than, less than, thousands, hundreds, tens, ones



Materials

Place value mat

PLACE VALUE MAT			
Thousands	Hundreds	Tens	Ones



Teaching Procedure

Mental Activity (5 minutes)

Learners play “Numbers in equivalent ways” game (M2)

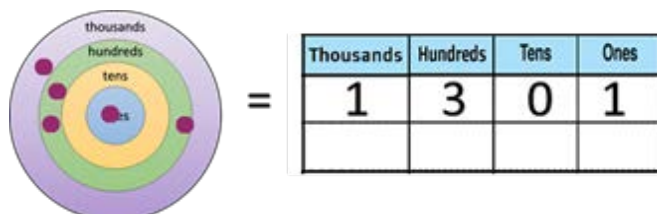
Reinforcement (5 minutes)

Learners write any 5 multiples of 1000 from 1,500 to 9,500 sequentially.

E.g. 2000, 3000, 4000, 5000, ...

Learning Activity (40 minutes)

Learners play the number wheel and record the numbers played in place value charts. (**Activity 5D**)



Learners create two or more different numbers from parts of the numbers played on the number wheel and write the completed numbers.

Learners compare and order the randomised numbers

PLACE VALUE CHART			
Thousands	Hundreds	Tens	Ones
3	0	4	8
3	4	2	1

$$3,048 < 3421$$

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 3 - Week Four (Lesson 1)



Big Idea

Addition of 2- and 3-digit numbers



Hundreds	Tens	Ones
1	2	2
+	2	1
?	?	3



Learning Outcomes

Add 2- and 3-digit numbers which sums up to 9999



Key Words

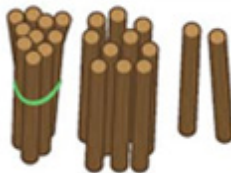
Add, sum, total, regroup,



Materials

Addition frame/mat, straws/sticks and place value discs

	Hundreds	Tens	Ones
+			
=			

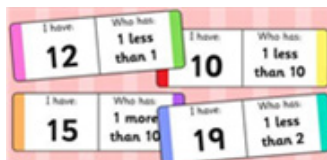




Teaching Procedure

Mental Activity (5 minutes)

Learners play “One more/less, two more /less...” game (M8)



Reinforcement (5 minutes)

Give learners some straws to make bundles of 100, bundles of 10 and loose ones.



Hundreds	Tens	Ones
1	2	5

Learning Activity (40 minutes)

Learners solve addition problems involving 2-digit and 3-digit numbers using bundles of straw and loose straws or using place value discs or the addition frame/mat. Example, $421 + 27$, $465 + 14$. **(Activity 6C)**

Learners solve addition tasks using the straws or sticks or place value disks and addition frame/mat.

	Hundreds	Tens	Ones
	4	2	1
+		2	7
=	4	4	8

Give learners more addition problems for practice.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

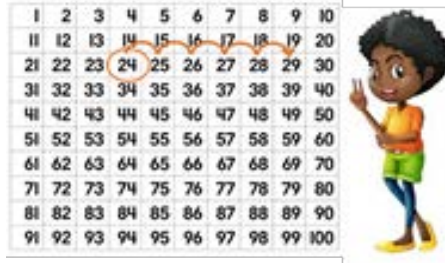
Refer to workbook page.

Module 3 - Week Four (Lesson 2)



Big Idea

Addition of 2-digit numbers using number chart



Learning Outcomes

Add 2- and 3-digit numbers up to 9999



Key Words

Add, sum, altogether, how many more?



Materials

Place value chart, place value disc and addition mat/frame

	Hundreds	Tens	Ones
+			
=			

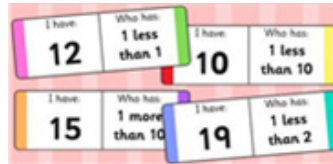
PLACE VALUE MAT			
Thousands	Hundreds	Tens	Ones



Teaching Procedure

Mental Activity (5 minutes)

Learners play “One more/less, two more /less...” games (M8)



Reinforcement (5 minutes)

Learners play “Base-Ten Riddles” games (M6)

Learning Activity (40 minutes)

Assist learners to perform addition tasks involving 2- and 3-digit numbers using the regrouping strategy. **(Activity 7C).** Give learners further tasks to practice

Reflection/Plenary

Engage learners with reflective questions.

Self-Practice

Refer to workbook page.

Module 3 - Week Five (Lesson 1)



Big Idea

Subtraction of a 2-digit number from a 3-digit number



Learning Outcomes

Subtract 2-digit numbers from 3-digit numbers



Key Words

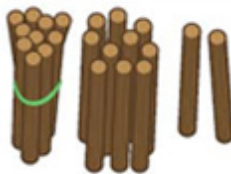
Subtract, minus, difference, how many left? less,



Materials

Subtraction frame and sticks or straws

	Hundreds	Tens	Ones
+			
=			





Teaching Procedure

Mental Activity (5 minutes)

Learners play the “Doubles/doubles plus one” game (M3), (M4)

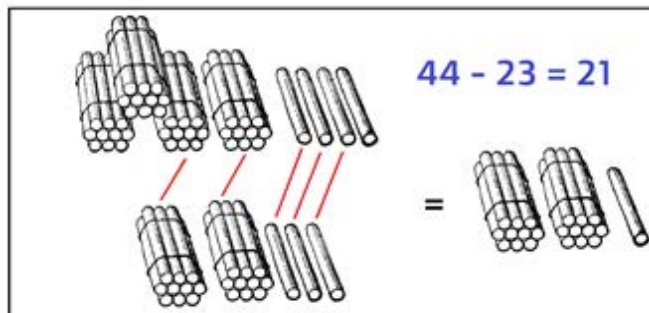
$$3 + 3 + 1 = 7$$

Reinforcement (5 minutes)

Learners play “Numbers in Equivalent Ways” game (M2)

Learning Activity (40 minutes)

Learners solve subtraction problems involving 2-digit numbers and 3-digit numbers using bundles of ten straws and loose ones. **(Activity 10C).**



Give learners further tasks to practice.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 3 - Week Five (Lesson 2)



Big Idea

Subtraction of a 2-digit number from a 3-digit number



Learning Outcomes

Subtract 2-digit numbers from 3-digit numbers



Key Words

Subtract, minus, difference, how many left? less,



Materials

Number line





Teaching Procedure

Mental Activity (5 minutes)

Learners play "One more/less, two more /less..." (M8)

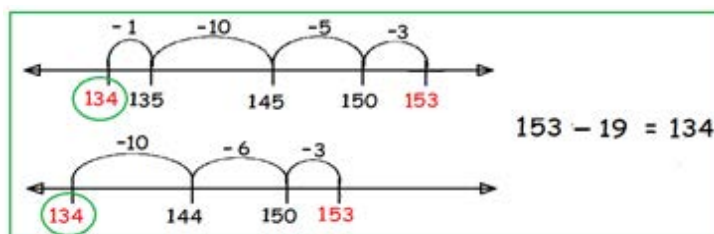
I have: 18	Who has...? 1 more than 7
I have: 8	Who has...? 1 more than 1
I have: 2	Who has...? 1 more than 18

Reinforcement (5 minutes)

Learners subtract 2-digit numbers from 3-digit numbers using the number line.

Learning Activity (40 minutes)

Learners should solve problems involving subtraction of 2-digit numbers from 3-digit numbers using the Number Chart. For example: $128 - 15$; $284 - 33$. **(Activity 12C)**



Give learners more tasks for practice

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 3 - Week Six (Lesson 1)



Big Idea

Multiplication of two 2-digit numbers

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144



Learning Outcomes

Multiply a 2-digit number by a 2-digit number



Key Words

Multiply, doubles, squares, product, groups of, lots of



Materials

Multiplication chart, A4 sheets, straws and bottle caps

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

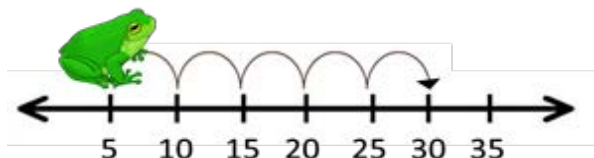




Teaching Procedure

Mental Activity (5 minutes)

Learners play “Skip count by 5s...” game (M5)



Reinforcement (5 minutes)

Have learners play the “Base ten riddles” game (M6)

Learning Activity (40 minutes)

Learners read from the multiplication chart to identify patterns such as doubles, squares, factors, multiples (Activity 16C).

1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90
10	20	30	40	50	60	70	80	90	100

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 3 - Week Six (Lesson 2)



Big Idea

Multiplication of a 2-digit by a 2-digit number.

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144



Learning Outcomes

Multiply a 2-digit number by a 2-digit number



Key Words

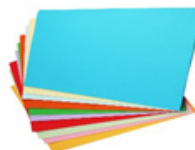
Subtract, minus, difference, how many left, less,



Materials

Multiplication chart and A4 sheets

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

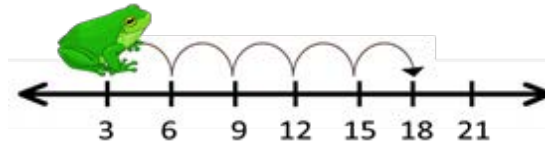




Teaching Procedure

Mental Activity (5 minutes)

Learners play “Skip count by 3s, 5s, 10s...” game (M5)



Reinforcement (5 minutes)

Learners play “one more”, “one less”, “ten less, ten more” (M...)

Learning Activity (40 minutes)

Learners multiply a 2-digit number by a 2-digit number using the “Expand and Box” method (**Activity 17B**).

Learners model the word problem into a mathematical sentence and solve them using the box method.

E.g. A bus can carry 32 passengers. If 25 of such buses are travelling to Tamale. How many passengers altogether will be on the buses?

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

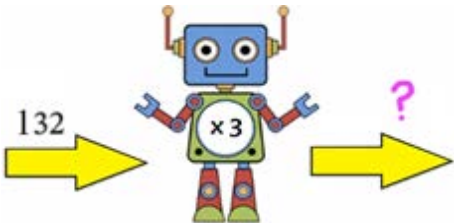
Refer to workbook page.

Module 3 - Week Seven (Lesson 1)



Big Idea

Multiply a 3-digit number by a 1-digit number.



Learning Outcomes

Multiply a 3-digit number by a 1-digit number



Key Words

Multiply, product, 3-digit number



Materials

A4 sheet of papers, pencils, ruler and multiplication chart

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144





Teaching Procedure

Mental Activity (5 minutes)

Learners play the “Base Ten Riddles” game (M6)

Reinforcement (5 minutes)

Learners do the “Skip count in 2s and 4s” starting from a given number to 100

counting by fours									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

Learning Activity (40 minutes)

Learners use the “Lattice” method to multiply a 3-digit number by a 1-digit number (**Activity 18C**).

Write word problems involving multiplication of a 3-digit number by a 1-digit number, and have the learners represent them mathematically and solve them.



E.g. Nurudeen was asked to supply mathematics textbooks to 5 schools in the Karaga District. Each school was to receive 185 of the textbooks. How many textbooks did he supply in all?

Reflection/Plenary

Engage learners with reflective questions.

Self-Practice

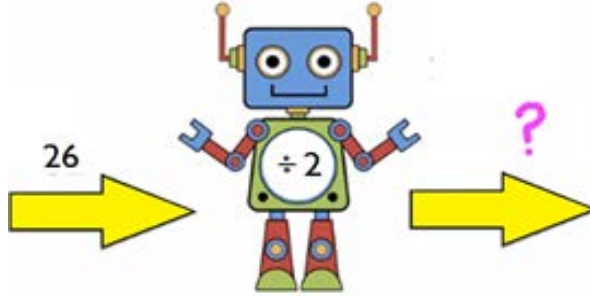
Refer to workbook page.

Module 3 - Week Seven (Lesson 2)



Big Idea

Division of 2-digit numbers by a 1-digit number



Learning Outcomes

Divide a 2-digit number by a 1-digit number



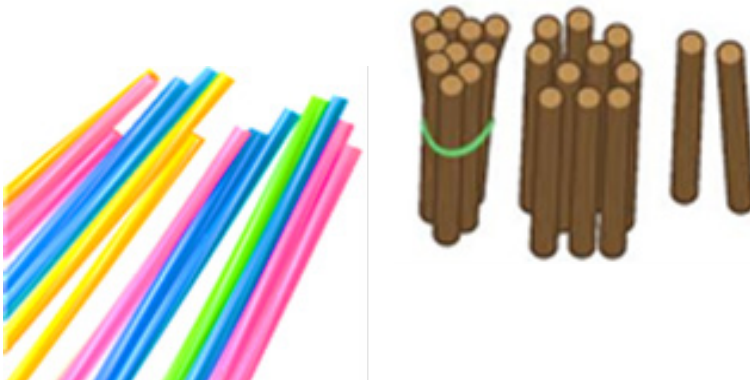
Key Words

Divide, equal groups, quotient



Materials

Straws or sticks and pebbles

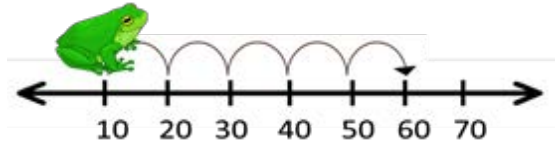




Teaching Procedure

Mental Activity (5 minutes)

Learners play do the “Skip count in 10s” game (M5)



Reinforcement (5 minutes)

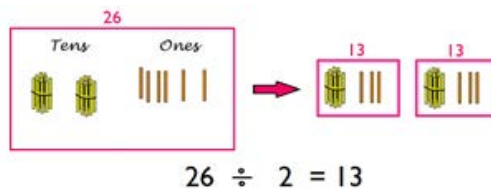
Give a quantity of objects (e.g., pebbles, straws) to learners to put them into groups.

Learning Activity (40 minutes)

Learners divide 2-digit numbers by 1-digit numbers using “Grouping” method (**Activity 19A**).

Write word problems involving division. Have learners represent mathematically and solve them.

E.g. A class teacher instructed 26 learners in her class to form 2 groups with equal number of students in each group. How many learners are there in each group?



Reflection/Plenary

Engage learners with reflective questions.

Self-Practice



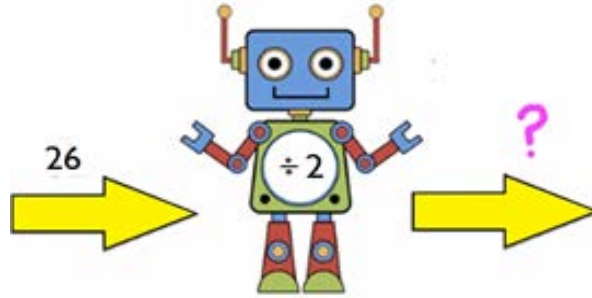
Refer to workbook page.

Module 3 - Week Eight (Lesson 1)



Big Idea

Division of 3-digit numbers by a 1-digit number.



Learning Outcomes

Divide a 3-digit number by a 1-digit number



Key Words

Divide, quotient, equal groups, repeated subtraction



Materials

Straws or sticks, pebbles and learners' note books





Teaching Procedure

Mental Activity (5 minutes)

Play "Skip count in 4s, 6s, 8s" (M5)

counting by fours									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

Reinforcement (5 minutes)

Give a quantity of objects to learners to put them into groups.

Learning Activity (25 minutes)

Learners divide 3-digit numbers by 1-digit numbers using "Repeated subtraction" (**Activity 22B**).

E.g. $18 \div 3 = 6$

$18 - 3 = 15$	①
$15 - 3 = 12$	②
$12 - 3 = 9$	③
$9 - 3 = 6$	④
$6 - 3 = 3$	⑤
$3 - 3 = 0$	⑥

Write word problems involving the division of a 3-digit number by a 1-digit number. Have learners represent mathematically and solve them.

E.g. A class teacher has 125 exercise books to be shared among 5 learners in her class. How many exercise books will each learner receive?

Reflection/Plenary

Engage learners with reflective questions.

Self-Practice

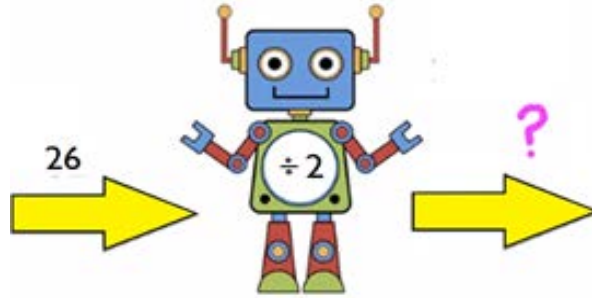
Refer to workbook page.

Module 3 - Week Eight (Lesson 2)



Big Idea

Division of 3-digit numbers by a 1-digit number.



Learning Outcomes

Divide a 3-digit number by a 1-digit number



Key Words

Divide, quotient, equal groups, repeated subtraction



Materials

Learners' note books.

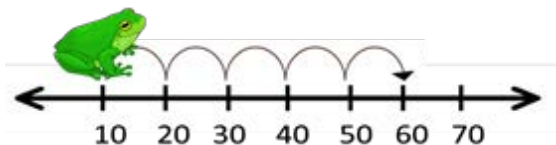




Teaching Procedure

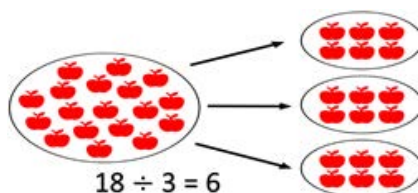
Mental Activity (5 minutes)

Learners play “Skip count in 10s” game (M5)



Reinforcement (5 minutes)

Give 18 objects to 3 learners to share.



Learning Activity (40 minutes)

Learners divide 3-digit numbers by 1-digit number using the “Big 7” method (**Activity 23**)

3	3	1	8	
-	3	0	0	100
		1	8	
	-	1	8	6
			0	106

Write word problems involving division of a 3-digit number by a 1-digit number, and have the learners represent them mathematically and solve.

E.g. A head teacher shared 120 desks equally among 8 classes. How many desks did each class receive?

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 4

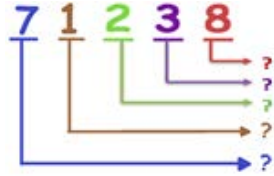
(Eight Week's Lessons)

Module 4 - Week One (Lesson 1)



Big Idea

The Place Value of numbers up to 10,000



Learning Outcomes

Identify and tell the place value of a digit in a number between 0 – 10,000

Compare and order a given set of numbers between 0 and 10,000 in ascending and descending order and using ">" or "<" .



Key Words

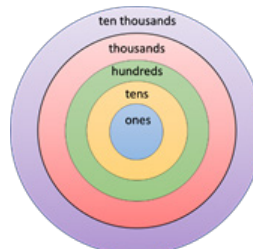
Compare, place value, position,



Materials

Place value chart, number word cards and place value discs

PLACE VALUE CHART				
Ten Thousands	Thousands	Hundreds	Tens	Ones





Teaching Procedure

Mental Activity (5 minutes)

Learners play the “Thinking of a number up to 100” game (M1)



Reinforcement (5 minutes)

Learners write numbers between 100 and 1,000 and tell the values of each digit in the number. E.g. 478 = 400 (Four hundred), 70 (Seventy) and 8 (Eight).

Learning Activity (40 minutes)

Select a five-digit number and model it on the place value chart to obtain a number. (**Activity 5D**). Example 59042

Ten Thousands	Thousands	Hundreds	Tens	Ones
5	9	0	4	2

59042

2 hundreds; 0 ones; 9 tens; 5 thousands; 40 thousand

5 ten thousand, 9 thousand, 0 hundred, 4 tens, 2 ones
Learners create two or more different numbers from parts of the number and write the completed numbers.

Learners compare the randomised numbers.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 4 - Week One (Lesson 2)



Big Idea

Comparing and Ordering of numbers up to 10,000



1024	?	2041

7516	?	7417



Learning Outcomes

Identify and tell the place value of a digit in a number between 0 – 10,000

Compare and order a given set of numbers between 0 and 10,000 in ascending and descending order and using ">" or "<"



Key Words

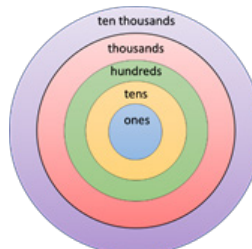
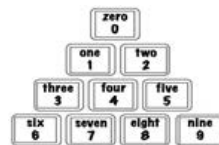
Compare, place value, position,



Materials

Place value chart, number word cards and place value discs

PLACE VALUE CHART				
Ten Thousands	Thousands	Hundreds	Tens	Ones





Teaching Procedure

Mental Activity (5 minutes)

Learners play “Who am I?” game with numbers up to 100. (M7)

I am a number.
I have 5 tens and 2 ones.
Who am I?



Reinforcement (5 minutes)

Learners compare numbers between 100 and 1,000, e.g. 303 and 330

Learning Activity (40 minutes)

Select a five-digit number and model it on the place value chart to obtain a number. (**Activity 5D**). Example 59042

Ten Thousands	Thousands	Hundreds	Tens	Ones
5	9	0	4	2

59042

2 hundreds; 0 ones; 9 tens; 5 thousands; 40 thousand

5 ten thousand, 9 thousand, 0 hundred, 4 tens, 2 ones

Learners create two or more different numbers from parts of the number and write the completed numbers.

Learners compare the randomized numbers.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 4 - Week Two (Lesson 1)



Big Idea

Addition sum up to 999.



Hundreds	Tens	Ones
1	2	2
+	2	1
?	?	3



Learning Outcomes

Add 3-digit numbers up to 999



Key Words

Add, sum, total, altogether



Materials

Chalkboard and addition mat/frame

	Hundreds	Tens	Ones
+			
=			

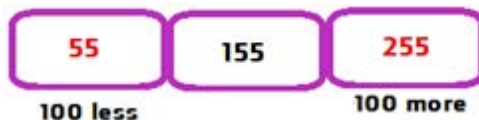




Teaching Procedure

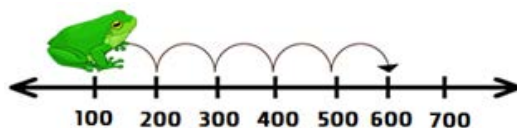
Mental Activity (5 minutes)

Learners play “Hundred more/less...” game (M8)



Reinforcement (5 minutes)

Learners play “Skip count in 100s to 1000s”



Learning Activity (40 minutes)

Learners add two 3-digit numbers using “regrouping” strategy. **(Activity 9C).**

Learners solve more problems in their exercise books using “regrouping” strategy E.g. $351 + 118$; $430 + 239$; $110 + 878$ etc.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 4 - Week Two (Lesson 2)



Big Idea

Addition sum up to 999.



Hundreds	Tens	Ones
1	2	2
+	2	1
?	?	3



Learning Outcomes

Add 3-digit numbers with addition sum up to 999



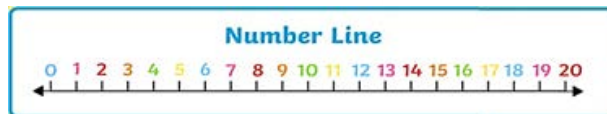
Key Words

Add, sum, total, altogether



Materials

Chalkboard, jotter and number line.





Teaching Procedure

Mental Activity (5 minutes)

Learners play “Thinking of a number” game starting from 1,000 to 10,000 (M1)



Reinforcement (5 minutes)

Learners play “Counting forwards and backwards” game in 100s and 1000s

E.g. 1000, 900, 800, 700, 600, 500, 400, 300, ...

Learning Activity (40 minutes)

Learners add two 3-digit numbers using “friendly jump” strategy on the number line. **(Activity 6D).**

Learners solve more problems in their exercise books using “friendly jumps” strategy.

E.g. $351 + 198$; $439 + 239$; $198 + 878$ etc.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 4 - Week Three (Lesson 1)



Big Idea

Subtraction of two 3-digit numbers



Learning Outcomes

Subtract a 3-digit number from a 3-digit number



Key Words

Subtract, minus, take-away,



Materials

Subtraction frame and chalkboard.

	Hundreds	Tens	Ones
+			
=			

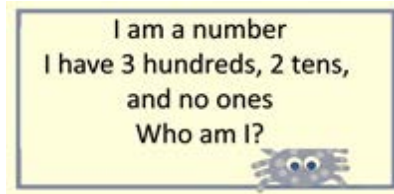




Teaching Procedure

Mental Activity (5 minutes)

Learners play “Who am I?” game using numbers between 100 and 1000 (M7)



Reinforcement (5 minutes)

Learners compare two 2-digit numbers between 10 and 100 using Tens and Ones. E.g. 25 and 52.

Learning Activity (40 minutes)

Learners subtract two 3-digit numbers using “regrouping” strategy. (**Activity 13E**).

Learners solve further problems in their jotters
E.g. $654 - 231$; $789 - 443$ etc.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 4 - Week Three (Lesson 2)



Big Idea

Subtraction of two 3-digit numbers



Learning Outcomes

Subtract a 3-digit number from a 3-digit number



Key Words

Subtract, minus, take-away,



Materials

Subtraction frame and chalkboard.

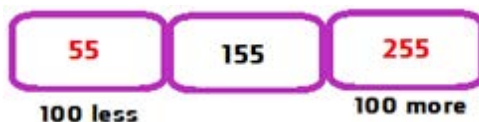




Teaching Procedure

Mental Activity (5 minutes)

Learners play “10 more/less, 100 more /less...” game (M8)



Reinforcement (5 minutes)

Learners compare two numbers between 100 and 1,000 using $>$ or $<$. E.g. 325 and 523

Hundreds	Tens	Ones
4	4	8
4	2	1

$448 > 421$

Learning Activity (40 minutes)

Learners subtract two 3-digit numbers using “friendly jump” strategy on the number line. **(Activity 12D).**

Learners solve further problems in their jotters
E.g. $654 - 238$; $787 - 499$ etc.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 4 - Week Four (Lesson 1)



Big Idea

Modelling addition word problems.



Learning Outcomes

Model and solve addition word problems



Key Words

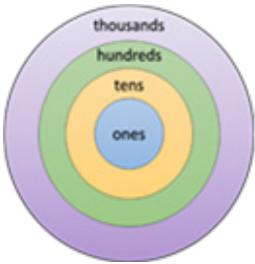
Add, total, sum, altogether



Materials

Bundles of straws, addition frame and place value discs

	Hundreds	Tens	Ones
+			
=			





Teaching Procedure

Mental Activity (5 minutes)

Learners play “Count forward in 100s” game

E.g. 121, 221, 321, 421, 521, 621, 721, 821, ...

Reinforcement (5 minutes)

Write word problems involving addition of two 2-digit numbers on board and have learners solve them.



Learning Activity (40 minutes)

Learners use appropriate strategies to solve the problems

Learners change addition word problems involving two 3-digit numbers into mathematical sentences and solve them in their exercise books. **(Activity 11D 1)**

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 4 - Week Four (Lesson 2)



Big Idea

Modelling subtraction word problems.



Learning Outcomes

Model and solve subtraction word problems



Key Words

Subtract, altogether, total, minus,



Materials

Subtraction frame, number chart and bundles of straws/sticks

	Hundreds	Tens	Ones
+			
=			



Numbers 1-100									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Teaching Procedure

Mental Activity (5 minutes)

Learners play “Count backwards in 100s” game

E.g. 950, 850, 750, 650, 550, 450, 350, ...

Reinforcement (5 minutes)

Write word problems involving subtraction of 2-digit number from another 2-digit number on board and have learners solve.



Learning Activity (40 minutes)

Learners model subtraction word problems involving 3-digit numbers into mathematical sentences. (**Activities 12E; 13E**)

Learners use appropriate strategies to solve the problems. Learners change subtraction word problems involving two 3-digit numbers into mathematical sentences and solve them in their exercise books.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 4 - Week Five (Lesson 1)



Big Idea

Multiplication of a 3-digit number by a 1-digit number



Learning Outcomes

Multiply a 3-digit number by a 1-digit number



Key Words

Product, multiply,



Materials

A4 sheet of papers/learners' note book

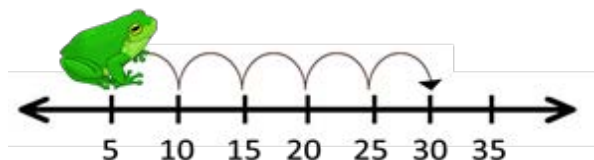




Teaching Procedure

Mental Activity (5 minutes)

Learners play “Skip count by 5s, 10s, 20s...” game



Reinforcement (5 minutes)

Learners play “Base ten riddles”

Learning Activity (40 minutes)

Learners multiply a 3-digit number by a 1-digit number using “lattice” strategy. **(Activity 18C)**

Write multiplication problems involving a 3-digit number by a 1-digit number on the board and have learners solve them using the “lattice” strategy.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Module 4 - Week Five (Lesson 2)



Big Idea

Multiplication of a 3-digit number by a 1-digit number



Learning Outcomes

Multiply a 3-digit number by a 1-digit number



Key Words

Multiply, product, groups of, lots of



Materials

A4 sheet of papers/learners' note book

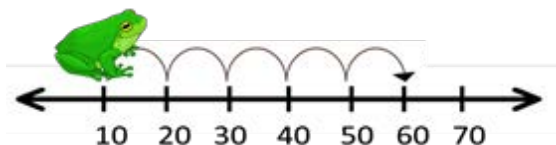




Teaching Procedure

Mental Activity (5 minutes)

Learners play “Skip count by 5s, 10s, 20s...” game



Reinforcement (5 minutes)

Learners play “Base ten riddles” game.

Learning Activity (40 minutes)

Learners multiply a 3-digit number by a 1-digit number using “box/partial decomposition” strategy. **(Activity 17D)**

Write multiplication problems involving a 3-digit number and a 1-digit number on the board and have learners solve them using “partial decomposition” strategy.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

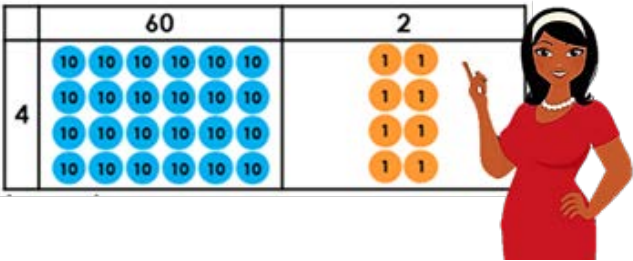
Refer to workbook page.

Module 4 - Week Six (Lesson 1)



Big Idea

Modelling multiplication word problem involving a 3-digit number and 1-digit number



Learning Outcomes

Model multiplication word problems involving a 3-digit number and a 1-digit number.



Key Words

Word problem, multiply, times, product, model



Materials

A4 sheets/learner's note book and multiplication table



MULTIPLICATION TABLE				
1	2	3	4	5
1x1=1	1x2=2	1x3=3	1x4=4	1x5=5
2x1=2	2x2=4	2x3=6	2x4=8	2x5=10
3x1=3	3x2=6	3x3=9	3x4=12	3x5=15
4x1=4	4x2=8	4x3=12	4x4=16	4x5=20
5x1=5	5x2=10	5x3=15	5x4=20	5x5=25
6x1=6	6x2=12	6x3=18	6x4=24	6x5=30
7x1=7	7x2=14	7x3=21	7x4=28	7x5=35
8x1=8	8x2=16	8x3=24	8x4=32	8x5=40
9x1=9	9x2=18	9x3=27	9x4=36	9x5=45
10x1=10	10x2=20	10x3=30	10x4=40	10x5=50
6	7	8	9	10
1x6=6	1x7=7	1x8=8	1x9=9	1x10=10
2x6=12	2x7=14	2x8=16	2x9=18	2x10=20
3x6=18	3x7=21	3x8=24	3x9=27	3x10=30
4x6=24	4x7=28	4x8=32	4x9=36	4x10=40
5x6=30	5x7=35	5x8=40	5x9=45	5x10=50
6x6=36	6x7=42	6x8=48	6x9=54	6x10=60
7x6=42	7x7=49	7x8=56	7x9=63	7x10=70
8x6=48	8x7=56	8x8=64	8x9=72	8x10=80
9x6=54	9x7=63	9x8=72	9x9=81	9x10=90
10x6=60	10x7=70	10x8=80	10x9=90	10x10=100



Teaching Procedure

Mental Activity (5 minutes)

Learners play the “Base ten riddle” game

Reinforcement (5 minutes)

Learners play the “Base ten riddles” game and use their responses to fill the chart as indicated below

Riddle	Number
I have 6 tens and 4 ones. What number am I?	
I have 5 tens and 9 ones. What number am I?	

Learning Activity (40 minutes)

Learners model multiplication word problems involving multiplying 3-digit numbers by 1-digit numbers and solve them using appropriate strategies. **(Activity 17D)**

Give learners simple word problems involving the multiplication of a 3-digit number by a 1-digit number and learners model and solve them using strategies learnt.



Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

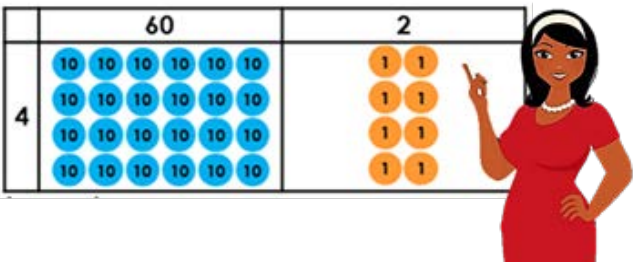
Refer to workbook page.

Module 4 - Week Six (Lesson 2)



Big Idea

Multiplication word problems



Learning Outcomes

Model multiplication word problems involving a 3-digit number and a 1-digit number.



Key Words

Multiply, product, times, groups of



Materials

A4 sheetss/learner's note book and multiplication table



MULTIPLICATION TABLE				
1	2	3	4	5
1x1=1	1x2=2	1x3=3	1x4=4	1x5=5
2x1=2	2x2=4	2x3=6	2x4=8	2x5=10
3x1=3	3x2=6	3x3=9	3x4=12	3x5=15
4x1=4	4x2=8	4x3=12	4x4=16	4x5=20
5x1=5	5x2=10	5x3=15	5x4=20	5x5=25
6x1=6	6x2=12	6x3=18	6x4=24	6x5=30
7x1=7	7x2=14	7x3=21	7x4=28	7x5=35
8x1=8	8x2=16	8x3=24	8x4=32	8x5=40
9x1=9	9x2=18	9x3=27	9x4=36	9x5=45
10x1=10	10x2=20	10x3=30	10x4=40	10x5=50
6	7	8	9	10
1x6=6	1x7=7	1x8=8	1x9=9	1x10=10
2x6=12	2x7=14	2x8=16	2x9=18	2x10=20
3x6=18	3x7=21	3x8=24	3x9=27	3x10=30
4x6=24	4x7=28	4x8=32	4x9=36	4x10=40
5x6=30	5x7=35	5x8=40	5x9=45	5x10=50
6x6=36	6x7=42	6x8=48	6x9=54	6x10=60
7x6=42	7x7=49	7x8=56	7x9=63	7x10=70
8x6=48	8x7=56	8x8=64	8x9=72	8x10=80
9x6=54	9x7=63	9x8=72	9x9=81	9x10=90
10x6=60	10x7=70	10x8=80	10x9=90	10x10=100



Teaching Procedure

Mental Activity (5 minutes)

Learners play the “Base ten riddle” game and fill in the chart.

Riddle	Number
I have 6 tens and 4 ones. What number am I?	
I have 5 tens and 9 ones. What number am I?	

Reinforcement (5 minutes)

Learners work out multiplication involving two 2-digit numbers. E.g. 57×42 .

Learning Activity (40 minutes)

Learners model multiplication word problems involving multiplying 3-digit numbers and a 1-digit number and solve them using appropriate strategies. **(Activity 17E)**

Give learners simple word problems involving the multiplication of 3-digit number by 1-digit number and learners model and solve them using strategies learnt as evaluation.



Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

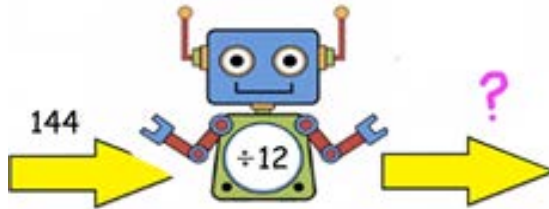
Refer to workbook page.

Module 4 - Week Seven (Lesson 1)



Big Idea

Division of whole numbers



Learning Outcomes

Divide a 3-digit number by a 2-digit number



Key Words

Share, divide, equal groups, repeated subtraction



Materials

Learners' note books.





Teaching Procedure

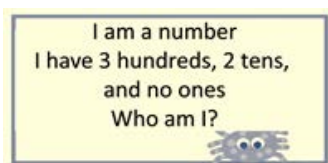
Mental Activity (5 minutes)

Learners play the “Doubles” game using numbers that end with 0 starting from 10 up to 1,000 (M3)

$$30 + 30 + 10 = 70$$

Reinforcement (5 minutes)

Learners play the “Who am I?” game (M7)



Learning Activity (40 minutes)

Learners solve division of 3-digit numbers by 2-digit numbers problem using “repeated subtraction” strategy. **(Activity 22E).**

Give learners further tasks to practice using repeated subtraction.

E.g. $124 \div 24 = 5$

$124 - 24 = 100$	①
$100 - 24 = 76$	②
$76 - 24 = 48$	③
$48 - 24 = 24$	④
$24 - 24 = 0$	⑤

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

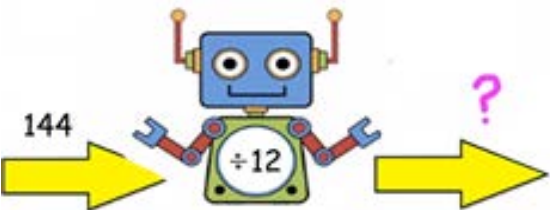
Refer to workbook page.

Module 4 - Week Seven (Lesson 2)



Big Idea

Division of a 3-digit number by a 2-digit number



Learning Outcomes

Divide a 3-digit number by a 2-digit number.



Key Words

Share, divide, equal groups, subtraction



Materials

Note book and multiplication table



MULTIPLICATION TABLE				
1	2	3	4	5
1 x 1 = 1	1 x 2 = 2	1 x 3 = 3	1 x 4 = 4	1 x 5 = 5
2 x 1 = 2	2 x 2 = 4	2 x 3 = 6	2 x 4 = 8	2 x 5 = 10
3 x 1 = 3	3 x 2 = 6	3 x 3 = 9	3 x 4 = 12	3 x 5 = 15
4 x 1 = 4	4 x 2 = 8	4 x 3 = 12	4 x 4 = 16	4 x 5 = 20
5 x 1 = 5	5 x 2 = 10	5 x 3 = 15	5 x 4 = 20	5 x 5 = 25
6 x 1 = 6	6 x 2 = 12	6 x 3 = 18	6 x 4 = 24	6 x 5 = 30
7 x 1 = 7	7 x 2 = 14	7 x 3 = 21	7 x 4 = 28	7 x 5 = 35
8 x 1 = 8	8 x 2 = 16	8 x 3 = 24	8 x 4 = 32	8 x 5 = 40
9 x 1 = 9	9 x 2 = 18	9 x 3 = 27	9 x 4 = 36	9 x 5 = 45
10 x 1 = 10	10 x 2 = 20	10 x 3 = 30	10 x 4 = 40	10 x 5 = 50
6	7	8	9	10
1 x 6 = 6	1 x 7 = 7	1 x 8 = 8	1 x 9 = 9	1 x 10 = 10
2 x 6 = 12	2 x 7 = 14	2 x 8 = 16	2 x 9 = 18	2 x 10 = 20
3 x 6 = 18	3 x 7 = 21	3 x 8 = 24	3 x 9 = 27	3 x 10 = 30
4 x 6 = 24	4 x 7 = 28	4 x 8 = 32	4 x 9 = 36	4 x 10 = 40
5 x 6 = 30	5 x 7 = 35	5 x 8 = 40	5 x 9 = 45	5 x 10 = 50
6 x 6 = 36	6 x 7 = 42	6 x 8 = 48	6 x 9 = 54	6 x 10 = 60
7 x 6 = 42	7 x 7 = 49	7 x 8 = 56	7 x 9 = 63	7 x 10 = 70
8 x 6 = 48	8 x 7 = 56	8 x 8 = 64	8 x 9 = 72	8 x 10 = 80
9 x 6 = 54	9 x 7 = 63	9 x 8 = 72	9 x 9 = 81	9 x 10 = 90
10 x 6 = 60	10 x 7 = 70	10 x 8 = 80	10 x 9 = 90	10 x 10 = 100



Teaching Procedure

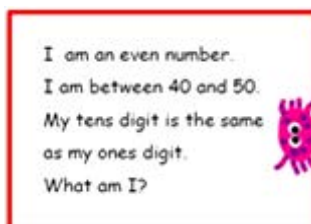
Mental Activity (5 minutes)

Learners play the “Doubles” game using numbers which end with 5, starting from 5 up to 995 (M3)

$$\begin{array}{|c|} \hline 35 \\ \hline \end{array} \begin{array}{|c|} \hline 35 \\ \hline \end{array} + \begin{array}{|c|} \hline 10 \\ \hline \end{array} = \begin{array}{|c|} \hline 80 \\ \hline \end{array}$$

Reinforcement (5 minutes)

Learners play the “Who am I?” game (M7)



Learning Activity (40 minutes)

Learners solve division of 3-digit numbers by 2-digit numbers problems using the “Big 7” strategy. **(Activity 23E)**

E.g. $156 \div 12 = 13$

12	1	5	6	
	-	1	2	0
			3	6
		-	3	6
			0	
				13

10
3

Give learners further problems to practice using “Big 7” strategy.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

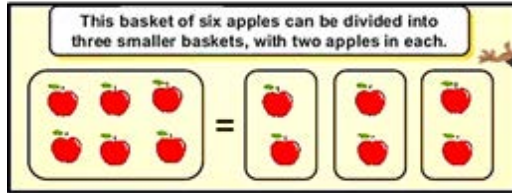
Refer to workbook page.

Module 4 - Week Eight (Lesson 1)



Big Idea

Division word problems



Learning Outcomes

Model and solve division word problems involving a 3-digit number by a 2-digit number



Key Words

Share, divide, equal groups, subtraction, groups of



Materials

Learners' note books.





Teaching Procedure

Mental Activity (5 minutes)

Learners play “Count forward in 10s” game (M5)

E.g. 15, 25, 35, 45, 55, 65, 75, 85, ...

Reinforcement (5 minutes)

Write problems involving division of a 3-digit number and a 1-digit number on the board and have learners solve them.

E.g. $180 \div 9$



Learning Activity (40 minutes)

Learners model and solve division word problems involving a 3-digit number and a 2-digit number using appropriate strategies. **(Activity 21D)**

Learners repeat activity with different values.

Learners model division word problems into mathematical statements and solve them in their exercise books.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

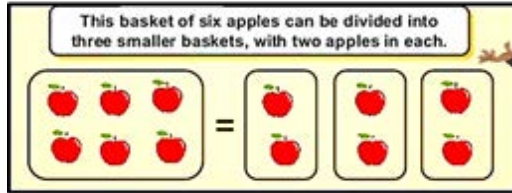
Refer to workbook page.

Module 4 - Week Eight (Lesson 2)



Big Idea

Division word problems



Learning Outcomes

Model and solve division word problems involving a 3-digit number and a 2-digit number.



Key Words

Share, divide, equal groups, repeated subtraction



Materials

Learners' note books.





Teaching Procedure

Mental Activity (5 minutes)

Learners play “Count forward in 10s” game (M5)

E.g. 110, 120, 130, 140, 150, ...

Reinforcement (5 minutes)

Write problems involving division of a 3-digit number and a 1-digit number on the board and have learners solve them.

E.g. $180 \div 9$



Learning Activity (40 minutes)

Learners model and solve division word problems involving a 3-digit number and a 2-digit number using appropriate strategies. (**Activity 23C; 23D2; 23E**)

Learners repeat activity with different values.

Learners model division word problems into mathematical statements and solve them.

Reflection/Plenary

Engage learners in activities using reflective questions.

Self-Practice

Refer to workbook page.

Activity Book

(Mathematics)

ACTIVITY 1A

Counting and representation. 0 – 100

Material required:

Place value (tens and ones), countable objects (straws, sticks, bottle caps, beans, pebbles, beads) rubber bands or strings, small transparent containers, small sacks, number cards, and graph papers.



Teacher led Activity:

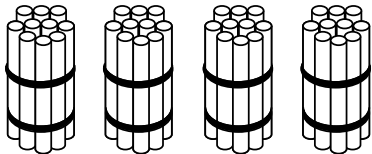
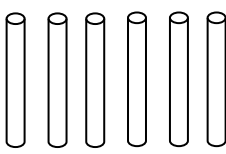
- Pick up a fistful of sticks or straws and count them.
- Introduce the rule to Learners: "If the number of straws is 10, we bundle or tie the 10 straws/sticks together with a rubber band. Thus, one bundle means 10! And 10 straws/sticks make a bundle of 1-ten. Less than 10 straws should stay loose". They do this continuously to about 100 loose ones which is 10 tens.

NB: We should know the bundle can also be done using 10 beads on strings, 10 small stones in sacks/containers etc.

Teacher led Activity:

- Learners sit in convenient groups.
- Learners in each group receive some quantity of sticks/ straws/pebbles, tiles etc. to count and write down the numeral that corresponds to the quantity counted.

- iii. Learners make tens and some loose ones and say the number of tens and loose ones they made.
- iv. Learners discuss in their groups the number of tens and loose ones they made from the objects counted and write them down. For instance, for 46 straws, Learners should say “We made 4 bundles of 10s and 6 loose ones”.

Tens	Ones
	

Note for the teacher

- Give Learners more task, let them count and write the number of bundles and loose ones made on a sheet of paper. Go around to assist Learners and encourage peer support
- Invite a couple of Learners to demonstrate activity to the class.

Teacher led Activity:

1. How many tens and ones did you make?
2. In working as a group, what role did you play?
3. How has bundling items into groups (tens and ones) helped you to count?

ACTIVITY 1B

Counting and representation. 0 – 100

Material required:

Place value (tens and ones), countable objects (straws, sticks, bottle caps, beans, pebbles, beads) rubber bands or strings, small transparent containers, small sacks, number cards, and graph papers.



Teacher led Activity:

- Pick a numeral card between 100 and 1000 and show the card to learners for them to identify the numeral by its number name.
- Model the numeral shown on the card with counting materials e.g. straws/sticks by bundling hundreds, tens and ones in the number. (Count the straws and bundle them according to number of Hundreds, Tens and loose ones). For example, in the number 247, there are 2 of hundred bundles, 4 of tens bundles and 7 loose straws.

Place Value Chart		
Hundreds	Tens	Ones



Learners Activity:

- i. Learners sit in convenient groups.
- ii. Learners working in groups, count in bundles of tens straws and loose ones.
- iii. Learners make bundles of hundreds, from the bundles of tens and loose ones and say the number of hundreds, tens and ones.
- iv. Learners identify number of tens in hundreds e.g. there are 10 tens in 100.
- v. Learners to select their leaders to share their findings.

Note for the teacher

- Give Learners more task, let them count and write the number of bundles and loose ones made on a sheet of paper.
- Go around to assist Learners and encourage peer support
- Invite a couple of Learners to demonstrate activity to the class.

Teacher led Activity:

1. How many tens did you count to get hundred?
2. What new things have you learn today?
3. What did you do to help your group?
4. Why is counting important in our lives?

ACTIVITY 1C

Modelling number quantities 1-1000

Material required:

The thousand place value chart, countable objects (straws, sticks, bottle caps, beans, pebbles, beads), rubber bands or strings, small transparent containers, small sacks, number cards, graph papers.



Teacher led Activity:

- Pick up a fistful of sticks or straws and count them.
- Introduce the rule to Learners: "If the number of straws is 10, we bundle or tie the 10 straws/sticks together with a rubber band. Thus, one bundle means 10! And 10 straws/sticks make a bundle. Less than 10 straws should stay loose". 10 bundles of 10 straws is 100. 10 bundles of 100 straws is 1000.

NB: Bundle can also be done using beads on strings, small stones in sacs/ container etc.

Teacher led Activity:

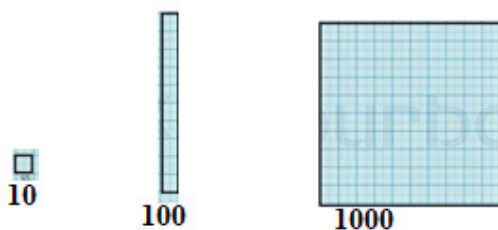
- Learners sit in convenient groups.
- Learners count bundles of hundred straws, bundles of ten straws and loose ones and.
- Learners make bundles of thousands from the bundles of hundreds, tens and loose ones.

- iv. Learners say the number of thousands, hundreds, tens and loose ones they make from the straws.
- v. Learners identify number of 100s and 10s in thousands e.g. there are 10 of 100s in thousand and 100 of 10s in thousand. For instance, for 2146 straws, Learners make 2 bundles of a thousand, 1 bundle of a hundred, 4 bundles of tens and 6 loose ones.
- vi. Learners put their bundled straws on the place value frame.
- vii. Learners write the number on the place value chart.

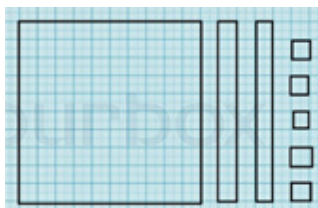
Teacher led Activity:

1. Display the graph sheet and discuss it with learners how to model and present the answer in various ways.

Let



- A small square=10
- A rectangle bar =100
- A big square=1000



=1250 since it has 1 big square,
2 rectangular bars and 5 small squares

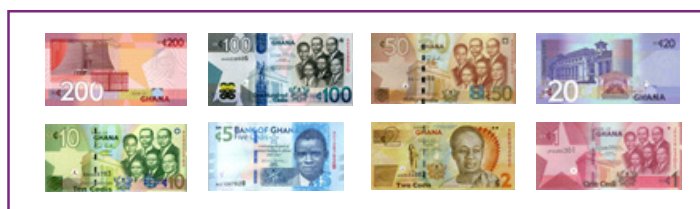
$$=1000+200+50=1250$$

Therefore, 1250 written in the expanded form $=1000+200+50+0$

2. Display the token currency and discuss with learners the various representations and use it to model numbers.

Example:

If we have



Then, the value of the currency below



We have 5 of 200, 6 of 100s, 2 of 50s, 1 of 20s, 3 of 10s, 3 of 5s, 3 of 2s and 2 of 1s.

This is $=1000+600+100+20+30+15+6+2=1773$

In expanded form of $1773 = 1000+700+70+3$

Note for the teacher

- Put Learners into small groups (4-5 members)
- Give each group straws to bundle and present into place value charts
- Give each group token currencies to present in equivalent ways
- Give each group graph sheets to model and present in equivalent ways
- Go around and assist learners
- Invite Learners to demonstrate to their answer to the class.

Reflection/Plenary:

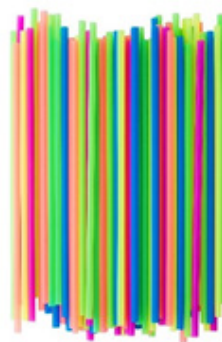
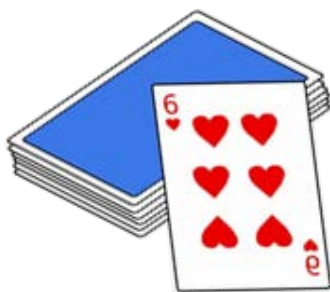
1. How many ones, tens, hundreds and thousands did you count in your number?
2. What new thing did you learn today?
3. What did you do to help your group?
4. Why is counting important in our lives?
5. What are some of challenges your faced?

ACTIVITY 2

Guess My Number Game

Material required:

Bottle tops in a container, pebbles in sacks, bunch of straws, cards in pack, match sticks in boxes etc.



Teacher led Activity:

- Put Learners into groups of 4-5 members.
- Let Learners know that, “in this game the group that makes the best estimate of the materials wins”. Every group has an opportunity to make an estimate within 5 seconds.



Learners Activity:

- Learners in groups make an estimate of the quantity starting from group one (G1).
- Each group take turns to estimate.
- A Learner counts to verify the number.
- Learners repeat the activity with different materials available but start with group two (G2); group 3 (G3) and so on.
- Each group takes turn, to count to verify the number.
- Learners repeat the activity several times with other materials and record the results in a table under the headings below:

Objects to estimate	Guess made				Number verified
	G1	G2	G3	G4	
Box of match sticks					
Stones in sack					
Cards in pack					
Bottle tops in a cup					

vii. The group with the best estimate after game wins.

Note for the teacher

- Each group should be given the opportunity to start.

Reflection/Plenary:

1. During the activity, which group chose the items (name them) for estimation?
2. What was challenging about the activity?
3. What strategy did your group use to get the estimation right or wrong? What were the estimates?
4. Have you ever estimated something in your life? What was it?
5. If you really want to improve on getting your estimation right, what strategies will you adopt?

NOTE: THIS GAME SHOULD BE PLAYED BY LEARNERS AT ALL LEVELS

ACTIVITY 3A&B

Number names, Recognition and Counting Sequentially

Material Required:

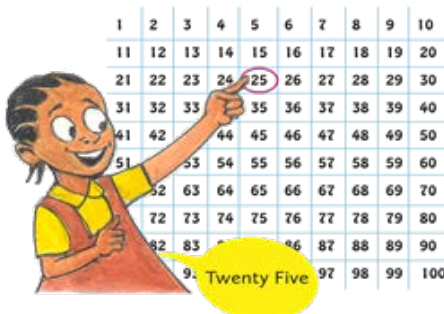
1000 Numeral charts, Numeral cards, Straws/Stick, etc.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Teacher led Activity:

- Display the numeral chart in a way that it is visible to all learners and they can place a finger on it and read.
- Read numbers on the numeral chart in different ways. For example: top to bottom, bottom to top, left to right, right to left, diagonally, skip count in 2s and 5s, and in random fashion without pointing to it on the chart to identify number patterns.
- Let Learners take turns to identify the numerals that match the mentioned number by the teacher on the numeral chart.



Learners Activity:

- Learners read the number names on the numeral chart in different ways, for example, top to bottom, bottom to top, left to right, right to

left, diagonally, randomly, and in a zigzag fashion as you point to the numerals with your pointer.

- ii. Learners take turns to use their fingers to point to numerals on the chart that matches the number names teacher calls out.
- iii. 2-4 learners to read numbers on the chat by skipping counts of 5s, or 10s or 20s or 50s.
- iv. Learners also read by skipping counts by 20s or 50s or 100s.
- v. Learners in smaller groups of 3-5, use a numeral chart to practice skipping counts
- vi. Learners place their fingers on numerals on the chart as the teacher calls out number names.
- vii. Learners identify a pattern and write down the pattern in their books.

Note for the teacher

- Go round to support and encourage them as they work to arrange their numeral cards.
- Have Learners create numeral chart (1 to100) at the inside back cover of their jotters so that they can use it.

Reflection/Plenary:

1. What helped you to identify the numeral for a number correctly on the numeral chart?
2. On the numeral chart, which number comes after 22?
3. From the numeral chart, which numbers are found at the diagonal/vertical/top to bottom position?
4. Did counting from different position pose a challenge? What did you do in such a situation? Did you count with someone?
5. What different strategies will you use in future to help you read your numbers correctly?

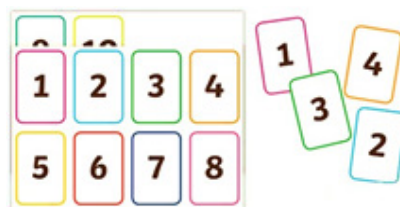
ACTIVITY 3C

Number names, Recognition and Counting Sequentially

Material Required:

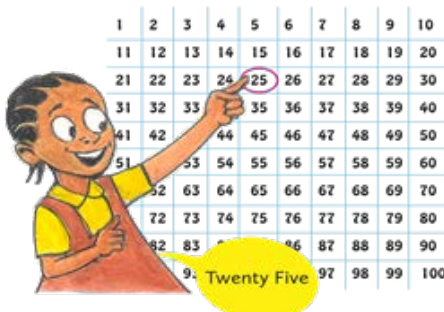
Numeral chart, square grid templates, numeral cards.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Teacher led Activity:

- Display the numeral chart in a way which is visible to all learners and such that they can place a finger on it and read.
- Read the number names on the numeral chart in different directions. For example, top to bottom, bottom to top, left to right, right to left, diagonally, and randomly.
- Skip counts in 2s up to 10s, and in zigzag fashion, without pointing to the numerals on the chart.
- As you call out the number names, get learners to point to their respective matching numerals on the numeral chart.



Learners Activity:

- 2-4 Learners identify numerals by their number names as class look on.
- Learners play '**Build a numeral Square**'.

- iii. Learners listen to explain the number square puzzle from teacher as a puzzle that is made up of different numbers (for example the number chart-100).
- iv. Learners observe the teacher preparing a numeral squares starting with 2.
- v. Learners individually work on 4 followed by 5.
- vi. Each group receives a set of number puzzle chart template.
- vii. Each group responds “mingle” as the teacher sings “mingle, mingle”!
- viii. Learners follow the teacher’s order or command to “build the number square starting with 10”! by placing the numeral cards on the template in a sequential manner.
- ix. Learners repeat this activity using the other templates.
- x. Learners discuss the position of the numbers in the built big number square, using top to down, down to top, diagonal and zigzag pattern.
- xi. Learners select a member from their group to check the work of others and confirm its appropriateness using the answers created by the teacher.

Reflection/Plenary:

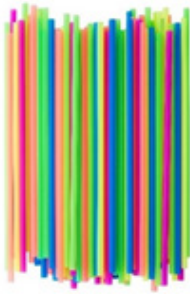
- 1. What helped you to place your number correctly on the number chart?
- 2. Which number comes after?
- 3. From your number chart, which numbers are found at the diagonal position?
- 4. Vertical/ top to bottom?
- 5. Did counting from different positions pose a challenge? What did you do in such a situation? Did you count with someone?
- 6. What different strategies will you use in future to help you read your numbers correctly from different positions?

ACTIVITY 4A

Place value of 2-digit numbers

Material required:

Place value mat/chat, straws or counting sticks, rubber bands or thread.



PLACE VALUE CHART	
Tens	Ones



Teacher led Activity:

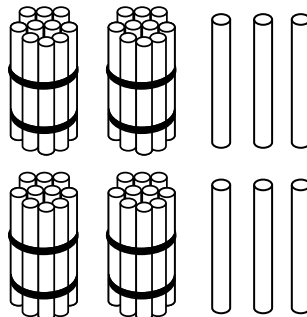
- Pick up a fistful of sticks or straws and count them.
- Introduce the rule to Learners: "If the number of straws is 10, we bundle or tie the 10 straws/sticks together with a rubber band. Thus, one bundle means 10! And 10 straws/sticks make a bundle. Less than 10 straws should stay loose".

Learners Activity:



- Learners sit in convenient groups.
- Learners count the counting sticks or straws and write down the numeral that corresponds to the quantity counted.
- Learners make bundles of ten and loose ones.
- Learners say the number of bundles and loose ones they make from the objects counted.

For instance, for 46 straws, Learners make 4 bundles of 10s and 6 loose ones.



- v. Learners listen to the teacher introducing the “tens” and “ones” place value frame.
- vi. Learners place the bundles in the Tens column and the loose straws in the Ones column.

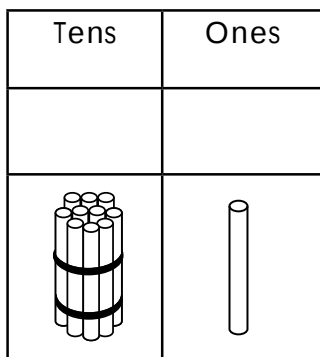


Figure 4a: Tens place value frame

- vii. Learners repeat the activity by partitioning straws into Tens and Ones..

Note for the teacher

- Go round to assist Learners.
- Invite a couple of Learners to demonstrate the activity to the class.

Reflection/Plenary:

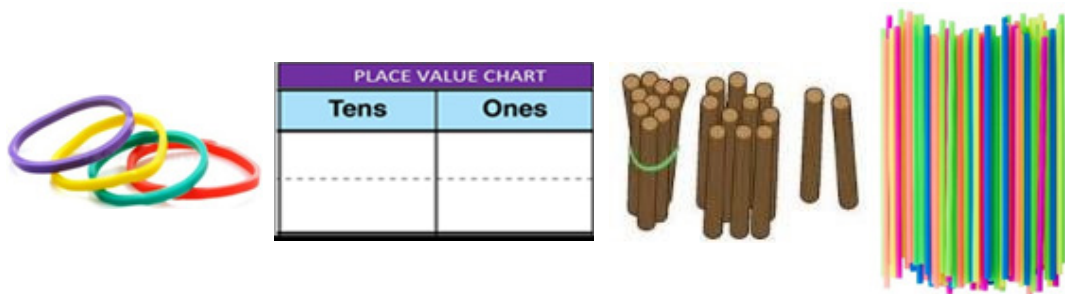
1. What role did you play in the group/team?
2. How does working in groups help?
3. What other materials can be used in teaching place value?
4. How would you use place value to compare two numbers?

ACTIVITY 4B

Making Bundles of Hundreds, Tens and Ones

Material required:

Place Value Mat/Frame, straws/stick, rubber bands/threads etc.



Teacher led Activity:

- Choose enough sticks/straws for this activity and in a group of 3-4 of the learners, guide them to count the straws/sticks and make bundles of 10 straws and loose ones. After, get them to bundle ten of the ten bundles to make bundles of hundreds. Let learners say/write the number of one hundred bundles, ten bundles and loose ones they make from the straws counted.
- For instance, for 348 straws, write the figure 348 on the writing board and say it and let them say after you. Guide the learners to make 3 bundle of 100s, 4 bundles of 10s and 8 loose ones. Introduce the hundreds place value frame. Have Learners place the bundles in the Hundreds, Tens and Ones columns of the frame.

Hundreds	Tens	Ones

Learners Activity:

- Learners sit in convenient groups.
- Learners in their groups receive a set of bundles of tens straws and loose ones from their teacher.



- iii. Learners count them.
- iv. Learners make bundles of hundreds, from the bundles of tens and loose ones and say the number of hundreds, tens and ones.
- v. Learners identify the number of tens in hundreds e.g. there are 10 - tens in 100.
- vi. Learners select their leaders to share their findings.
- vii. Learners repeat the activity by bundling straws into Hundreds, Tens and Ones.

Note for the teacher

- Give Learners more task, let them count and write the number of bundles and loose ones made, on a sheet of paper.
- Go around to assist Learners and encourage peer support.
- Invite a couple of Learners to demonstrate the activity to the class.

Reflection/Plenary:

1. How many tens did you count to get a hundred?
2. What new thing have you learn today?
3. What did you do to help your group?
4. Why is counting important in our lives?

ACTIVITY 4D

Place value of numbers 1-10000

Material required:

Place value charts, numeral cards, place value cards.

PLACE VALUE CHART	
Tens	Ones



Teacher led Activity:

(a) Demonstrate how to put the digits of a numerals on the place value chart. For example, the digits of the numerals 303 and 330, can be placed in the correct places on the place value chart as shown below:

Hundreds	Tens	Ones
3	0	3
3	3	0

(b) Lead learners to answer each of the following questions:

- How many tens are in each numeral?
- How many ones are in each numeral?
- How many hundreds are in each numeral?
- Which of the two numbers have more tens, or more hundreds or less ones etc.

(c) Guide learners to select any four digits from the numerals 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 and lead them to arrange the selected digits on the place value chart to make three different number. An example is shown below:

Thousands	Hundreds	Tens	Ones
9	0	4	2

(d) Discuss the number made:

For example: The numeral we have made is **9,042** and its number name is **Nine thousand and forty-two**.

(e) Now answer this:

- how many thousands?
- how many hundreds?
- how many tens?
- how many ones?

(f) Discuss the place value of each digit in the numeral 9,042 as: the place of 9 is the thousands, the place of 0 is hundreds, the place of 4 is tens, and the place value of 2 is the units or ones.

Learners Activity:



- i. Learners sit in convenient groups.
- ii. Learners select four digits randomly from the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9
- iii. Groups of Learners draw a thousand number chart and place the digits on it to make a number.
- iv. Learners in each group talk about the place value of each digit in the number created.
- v. Learners in each groups read their number and have them to model with the place value cards. (learners say how many thousands, hundreds, tens and units/ones)
- vi. Learners tell which of the number they have created is the smallest or the biggest and explain to justify their choice.

Note for the teacher

- Have learners make more numbers by extending the place value chart to include ten thousands, select the digits randomly, place them on the chart, talk about the place of each digit in the numbers created, use the place value card to model the number, and then write the expanded form of the number created.
- Invite a couple of Learners to demonstrate the activity to the class.

Ten Thousands	Thousands	Hundreds	Tens	Ones

Reflection/Plenary:

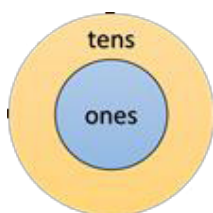
1. What is the most interesting thing you have learnt today?
2. What is the most difficult part of the activity?
3. In working as a group, what role did you play?
4. How does the place of a digit in a number help you to know the value of the number?

ACTIVITY 5A

Modelling and comparing-digit numbers using the number wheel

Material required:

Number Wheel, 9 pieces of stone (or pebbles).

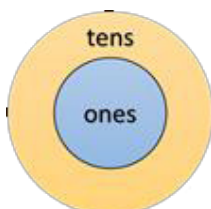


PLACE VALUE CHART	
Tens	Ones



Teacher led Activity:

- Discuss previous lesson with learners
- Give learners straws and ask them to bundle and represent on place value mat and place value frame. Ask learners to write the number in expanded form.
- Draw 2 concentric circles on the floor and label them ones and tens (as in diagram) for learners to see
- Label the circles as follows:
 - Innermost circle (wheel) represents Ones
 - Outermost circle (wheel) represents tens.
- Stand at a short distance from the outer circle and perform the following activities:
 - “throw 9 pebbles on the circles”
 - “remove the pebbles which have fallen on the circumference of the circles or which are outside of the last circle”.
 - “count the pebbles which are inside each of the circle and represent each on the place value chart”.
 - “Write down the number in the place value frame”
 - Write the number in the expanded form.
- Perform 3 or 4 more tasks and have learners compare and order the numbers using $>$ or $<$ or $=$



Learners Activity:

- i. Learners sit in small groups of 3-4.
- ii. Learners practice the drawing of the Number wheel on floor.
- iii. Learners do further practice using the above strategy to identify the place value of digits.
- iv. Learners receive assistance from teacher.
- v. 3 - 4 Learners demonstrate to the class, the activity.



Note for the teacher

- Emphasis the rule for playing the Number Wheel game.
- Give Learners more task, let them play the number wheel game, count and write the number of bundles and loose ones made on a sheet of paper and represent them on the place value frame drawn on the ground.
- Go around to assist learners and encourage peer support.
- Invite a couple of Learners to demonstrate activity to the class.

Reflection/Plenary:

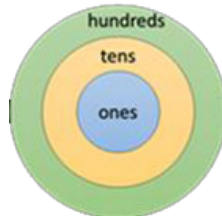
1. What did you do to get the pebbles on the wheel?
2. What are the rules for playing the game?
3. What number did you get after playing the game?
4. What were your challenges?

ACTIVITY 5B

Modelling Comparing three digits numbers

Material required:

Number Wheel, 9 pieces of stone (or pebbles).



Teacher led Activity:

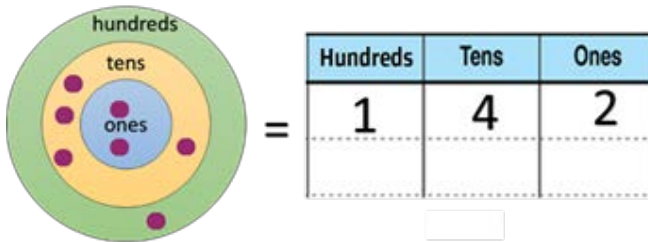
(a) Draw 3 concentric circles on the floor and label them ones, tens and hundreds (as in diagram) for learners to see. Label the circles as follows:

- Innermost circle (wheel) represents Ones
- second innermost circle (wheel) represents Tens
- outermost circle (wheel) represents hundreds

(b) Stand at a short distance from the outer circle and perform the following activities:

- “throw 9 pebbles on the circles”
- “remove the pebbles which have fallen on the circumference of the circles or which are outside of the last circle”.
- “count the pebbles which are inside each of the circle and represent each on the place value chart”.
- “Write down the number in the place value frame”

(c) Perform 3 or 4 more tasks and have learners compare and order the numbers using $>$ or $<$

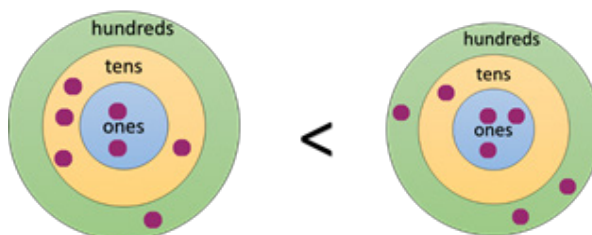


Learners Activity:

- i. Put Learners into small groups of 3-4.
- ii. Have learners practice the drawing of the Number wheel



- iii. Have Learners do further practice using the above strategy to identify the place value of digits and compare and order the digits using '<' or '>'.
- iv. Have learners order numbers recorded using less than (<) and greater than (>) after playing the number wheel game, e.g. $142 < 313$, into their jotters.



Note for the teacher

- Emphasis the rule for playing the Number Wheel game.
- Give Learners more task, let them play the number wheel game, count and write the number of bundles and loose ones made on a sheet of paper and represent them on the place value frame drawn on the ground.
- Emphasis on the ordering and comparing of the numbers using '<' or '>'
- Go around to assist struggling Learners and encourage peer support
- Invite a couple of Learners to demonstrate activity to the class.

Reflection/Plenary:

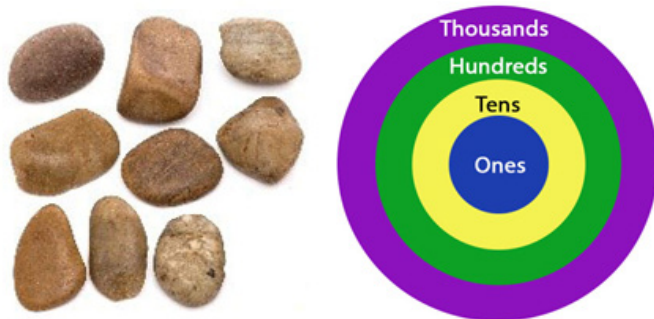
1. What did you do to get the pebbles on the wheel?
2. What are the rules for playing the game?
3. What number did you get after playing the game?
4. What signs did you use to compare and order the numbers recorded?
5. Why would you say one set of number is greater or less than the other?

ACTIVITY 5C1.1

Modelling and comparing 4-digit numbers

Materials/Resources required:

Number wheel, place value discs, place value mat/frame.



Teacher led Activity:

- (a) Draw 4 concentric circles on the floor and label them ones, tens, hundreds and thousands (as in the diagram) for learners to see.
- (b) Label the circles as follows:
- Innermost circle (wheel) represents **ones**
 - next innermost circle (wheel) represents **tens**
 - third inner circle (wheel) represents **hundreds**
 - outermost circle (wheel) represents **thousands**



Learners Activity:

- i. Learners stand at a short distance from the outer circle and perform the following activities:
- “throw 9 pebbles on the circles”
 - “remove the pebbles which have fallen on the the circles or which are outside of the last circle”.
 - “count the pebbles which are inside each of the circle and represent each on the place value chart”.
 - “Write down the number in the place value frame”.

Thousands	Hundreds	Tens	Ones

Figure 5b: thousands place value

- ii. Learners perform 3 or 4 more tasks and compare and order the numbers using '>' or '<'.
- iii. Learners present their answer in equivalent ways.
- iv. Learners sit in small groups of 4-5 members.
- v. Learners practice using the above strategy.
- vi. Learners perform 3 or four tasks at a time
- vii. Learners present their result in the place value chart.
- viii. Learners write their result in equivalent ways.
- ix. Learners compare and order their result using $>$, $<$ or $=$.

Note for the teacher

- Put Learners into small groups (4-5 members)
- Have Learners do further practice using the above strategy to identify the place value of digits
- Give learners similar task to perform
- Go round and assist
- Invite Learners to demonstrate to the class

Reflection/Plenary:

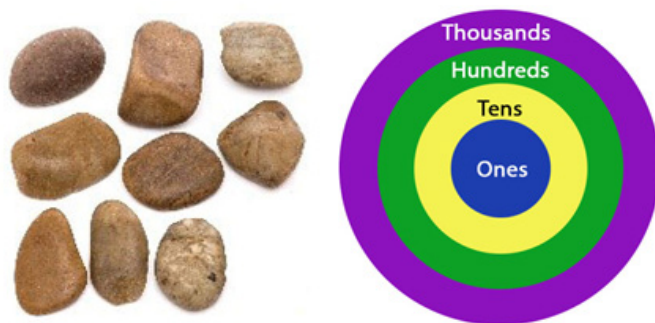
1. What did you do to get the pebbles on the wheel? What happened?
2. What materials did we use today?
3. Share a situation where you need to communicate an idea.
4. What was it about?
5. What do you consider when reporting your observations on the number wheel?
6. What challenges did you encounter when performing the activity?
7. What did you do differently to overcome the problem?

ACTIVITY 5C1.2

Place value of 4-digit numbers

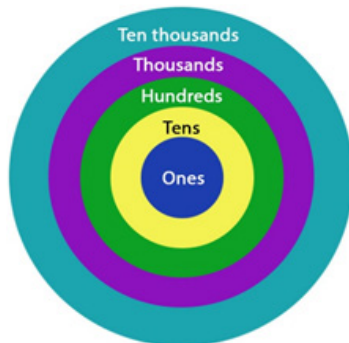
Materials required:

9 pebbles, Number wheel, place value discs, place value mat/frame.



Teacher led Activity:

(a) Draw 5 concentric circles on the floor and label them ones, tens, hundreds and thousands (as in the diagram) for learners to see.



The ten- thousands number wheel

(b) Label the circles as follows:

- Innermost circle (wheel) represents **ones**
- next innermost circle (wheel) represents **tens**
- third inner circle (wheel) represents **hundreds**
- fourth inner circle (wheel) represents **thousands**
- outermost circle (wheel) represents **ten - thousands**

(c) Learners stand at a short distance from the outer circle and perform the following activities:

- “throw 9 pebbles on the circles”

- “remove the pebbles which have fallen on the the circles or which are outside of the last circle”.
- “count the pebbles which are inside each of the circle and represent each on the place value chart”.
- “Write down the number in the place value frame”.
- Have learners compare and order number using $>$, $<$ or $=$

Thousands	Hundreds	Tens	Ones

Figure 5b: thousands place value



Learners Activity:

- Learners sit in small groups of 4-5 members.
- Learners draw the number wheel on the floor.
- Learners practice using the above strategy.
- Learners perform 3 or four tasks, put their result in the place value chart and compare and order using $>$, $<$ or $=$

Note for the teacher

- Put Learners into small groups (4-5 members)
- Have Learners do further practice using the above strategy to identify the place value of digits
- Go round and assist.
- Encourage peer support
- Invite Learners to demonstrate to the class.

Reflection/Plenary:

1. What did you do to get the pebbles on the wheel? What happened?
2. What materials did we use?
3. Share a situation where you need to communicate an idea.
4. What was it about?
5. What do you consider when reporting your observations on the number wheel?

ACTIVITY 5D

Comparing and ordering numbers 1- 10000

Material required:

Place value charts, number cards, place value tiles.

PLACE VALUE CHART	
Tens	Ones



Teacher led Activity:

- Write for example, the numerals 75628 and 75789 on the board.
- Write each digit on the place value chart under the correct place value.
- Starting from the greatest place value to the least, assist learners to compare the digits.
- Lead learners to conclude that 75628 is less than 75789 since in the hundreds place values for both numerals, the 6 in 75628 is less than the 7 in the 75789 (ie. 600 and 700).
- Using an inequality symbol, conclude that $75628 < 75789$.



Learners Activity:

- Learners select five digits from the digits: **0, 1, 2, 3, 4, 5, 6, 7, 8, and 9** and place them on the place value chart below to make a number:

Ten Thousands	Thousands	Hundreds	Tens	Ones

- Learners write the number they have created in expanded form.
- Using the “give one get one” strategy learners talk about the place value of the number created and model the number using the place value tiles
- Learners write the expanded form of the number created

- v. Learners create two more different numbers from the number they have made and show each number created, on the place value chart below.

Ten Thousands	Thousands	Hundreds	Tens	Ones

- vi. Learners answer the following questions about the number created
- Which of your numbers have more ones?,
 - Which of your numbers have less tens?.....
 - Which of your numbers have more hundreds?.....
 - Which of your numbers have more thousands?.....
 - Which of your numbers have more ten thousand?.....
- vii. Learners write the biggest number in expanded form.
- viii. Learners write the smallest number in expanded form.
- ix. Learners arrange the numbers they have made in order from the least to the largest and vice versa.

Note for the teacher

- Have learners make more numbers by selecting digit randomly and placing them on the place chart, talking about the place of each digit in the numbers created, using the place value tiles to model the number and then writing the expanded form of the number created
- Compare numbers using “<, >, =” and order numbers

Ten Thousands	Thousands	Hundreds	Tens	Ones

Reflection/Plenary:

1. What is the most interesting thing you have learnt today?
2. What is the most difficult part of the activity?
3. In working as a group, what role did you play?
4. How does the place of a digit in a number help you to know the value of the number?

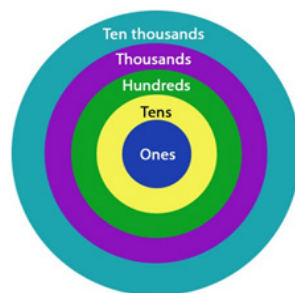
ACTIVITY 5E

Comparing 5 and 6-digit numbers

Materials/Resources required:

Number wheel, place value discs, place value mat/frame.

Place Value Chart				
Ten Thousands	Thousands	Hundreds	Tens	Ones



Teacher led Activity:

- Draw 5 concentric circles on the floor and label them ones, tens hundreds, thousands and ten thousand (as in the diagram) for learners to see.
- Label the circles as follows:
 - Innermost circle (wheel) represents **ones**
 - next innermost circle (wheel) represents **tens**
 - third inner circle (wheel) represents **hundreds**
 - outermost circle (wheel) represents **thousands**



Learners Activity:

- Learners stand at a short distance from the outer circle and perform the following activities:
 - “throw 9 pebbles on the circles”
 - “remove the pebbles which have fallen on the the circles or which are outside of the last circle”.
 - “count the pebbles which are inside each of the circle and represent each on the place value chart”.
 - “Write down the number in the place value frame”.

Place Value Chart					
Hunderd-Thousands	Ten-Thousands	Thousands	Hundreds	Tens	Ones

Figure 5b: thousands place value

- ii. Learners perform 3 or 4 more tasks and compare and order the numbers using '>' or '<'.
- iii. Learners present their answer in equivalent ways.
- iv. Learners sit in small groups of 4-5 members.
- v. Learners practice using the above strategy.
- vi. Learners perform 3 or four tasks at a time
- vii. Learners present their result in the place value chart.
- viii. Learners write their result in equivalent ways.
- ix. Learners compare and order their result using $>$, $<$ or $=$ symbols.

Note for the teacher

- Put Learners into small groups (4-5 members).
- Have Learners do further practice using the above strategy to identify the place value of digits.
- Give learners similar task to perform.
- Go round and assist.
- Invite Learners to demonstrate to the class.

Reflection/Plenary:

1. What did you do to get the pebbles on the wheel? What happened?
2. What materials did we use today?
3. Share a situation where you need to communicate an idea.
4. What was it about?
5. What do you consider when reporting your observations on the number wheel?
6. What challenges did you encounter when performing the activity?
7. What did you do differently to overcome the problem?

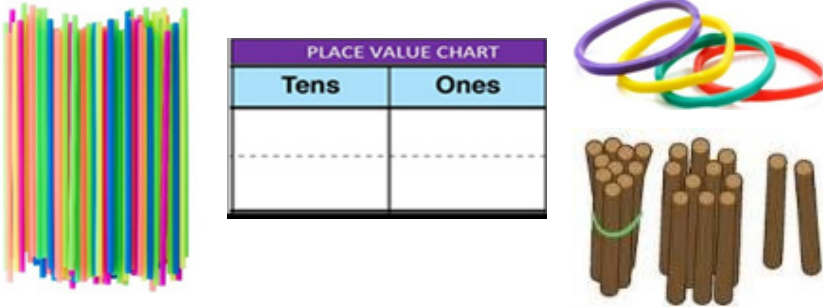
ACTIVITY 6A

Addition of 1-digit and 2-digit number

Doing Addition of Whole Numbers Using Addition Frame

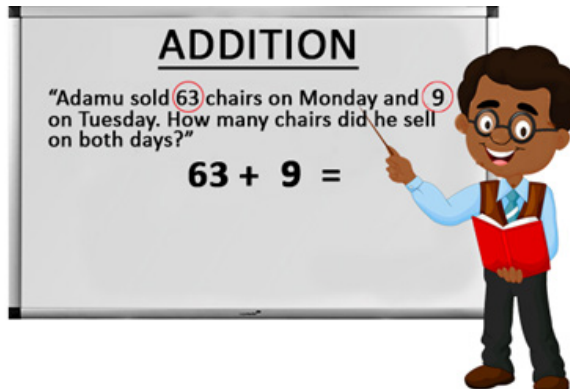
Material required:

Tens Addition frame, straws (bundles of tens and loose ones), and hundreds and thousands addition mat.



Teacher led Activity:

(a) Write the following addition problem on the board.



***"Adamu sold 63 chairs on Monday and 9 on Tuesday.
How many chairs did he sell on both days?"***

- (b) Guide the Learners to write mathematical expression for the word problem as $63 + 9 = ?$
- (c) Draw the addition frame on the blackboard and ask learners to draw same on the floor in their respective groups.
- (d) Instruct them to perform the following activities.



Learners Activity:

- i. Learners write $45 + 9 = ?$ in their jotters.
- ii. Learners to model/represent the first number (45) as 4 bundles of ten straws and 5 loose straws.
- iii. Learners mention “how many tens and how many units?”
- iv. Learners place the straws (4 bundles and 5 loose straws) in their respective position on the mat.
- v. Learners represent the second number (9) loose straws and place them in the ones' column in the second row.
- vi. Learners mention “how many Tens and how many ones?”
- vii. Learners draw down loose straws in unit's column to the bottom of the addition frame (Learners regroup the 14 straws into 1 bundle and 4 loose ones) and place them in their respective positions on the mat.
- viii. Again, Learners draw down the bundles in tens column to the bottom of the frame
- ix. Learners count and mention the number of bundles and loose straws at the bottom of the addition mat as the answer to the question as 5 bundles and 4 loose ones.

Place Value Frame	
Tens	Ones

Figure 1: Tens place value frame

- x. Learners conclude that $45 + 9 = 54$

Note for the teacher

- Put Learners into smaller groups at least 3-4.
- Have Learners do further practice using the above strategy in their groups and emphasis on the regroupings.
- Go round and support Learners
- Invite Learners to demonstrate strategy to the class.
- Have Learners do further practice using the above strategy.
- Ensure that learners solve more problems in their exercise books using “Addition mat”.

Reflection/Plenary:

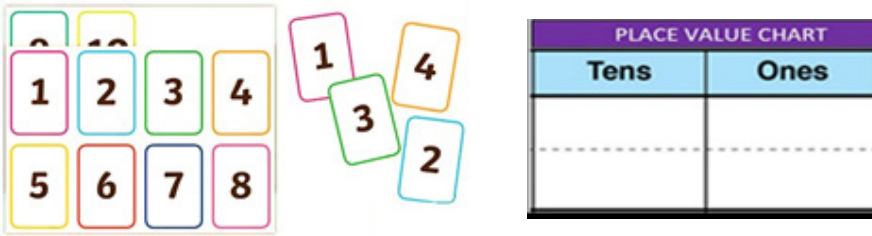
1. During the activity, how many bundles and loose ones did you make?
2. What strategy did you use to solve the word problem?
3. Say one interesting thing you have learnt today?
4. Why did you use addition for the word problem?
5. Apart from using addition in school, where else do we use addition?
6. What happens when you have more than nine straws in the units' column?

ACTIVITY 6B1

Number card game

Material required:

Number Cards from 0 to 9, Place Value Frame.



Teacher led Activity:

- Put learners in small groups of 4-5 and give out Number Cards numbered from 0 – 9 to each group.
- Guide learners to shuffle the cards and pick 3 cards at random
- Have learners use the three numbers to make three different numbers they can.
- Have learners write their 3 sets of numbers down. Guide them to compare and order the numbers using ' $<$ ' or ' $>$ '
- Write the numbers in expanded form.
- Guide the learners to represent their 3 sets of numbers on the place Value frame.



Learners Activity:

- Learners in their small groups of 4-5, play the Number Card Game.
- Learners write their 3 sets of numbers down.
- Learners do further practice using the above game to compare and order the digits using ' $<$ ' or ' $>$ '.
- Learners write their numbers in Expanded form.

Group/ 3 sets No.	1set	2nd set	3rd set
Group 1	351	531	513
Group 2	813	831	381
Group 3	474	744	447
Group 4	522	252	225

Comparing and Ordering of Numbers:

From: Group one, $315 < 513 < 531$,

Group two, $831 > 813 > 381$ etc.

Place value Frame

Hundreds	Tens	Ones
3	5	1

Comparing and Ordering of Numbers:

$351 = 300 + 50 + 1$

$813 = 800 + 10 + 3$ etc.

Note for the teacher

- Clearly explain the game to learners.
- Always put the results of the game in a table.
- Ensure that learners order the numbers in increasing and decreasing order. This should be done using '<' or '>'.
- Go around to assist Learners and encourage peer support.
- Invite a couple of Learners to demonstrate activity to the class.

Reflection/Plenary:

1. What was the biggest number you pick first in your group?
2. What are some of the challenges you faced when playing the game?
3. How can this game help you in comparing and Ordering of Numbers?
4. Why would you say one set of number is greater or less than the other?

ACTIVITY 6B2

Addition of two 2-digit numbers

Material required:

Tens Addition frame, straws (bundles and loose): hundreds and thousands addition mat.

PLACE VALUE CHART	
Tens	Ones



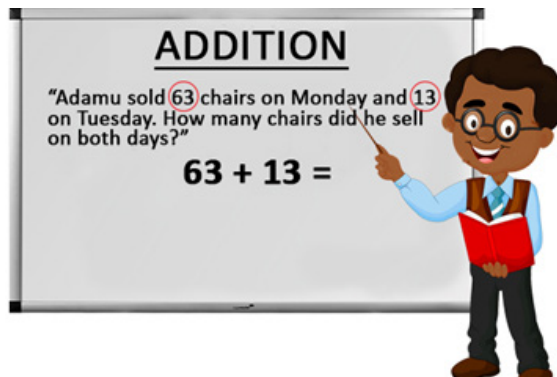
Hundreds	Tens	Ones

thousands	hundreds	tens	ones

_____ + _____ + _____ + _____

Teacher led Activity:

(a) Write the following addition problem on the board.



***“Adamu sold 63 chairs on Monday and 13 on Tuesday.
How many chairs did he sell on both days?”***

- Guide the Learners to write mathematical expression for the word problem as $63 + 13 = ?$
- Draw the addition mat on the floor and ask learners to draw same on the floor/table in their individual groups.
- Instruct them to perform the following activities.

Learners Activity:

- Learners write the expression $63 + 13 = ?$ in their jotters.
- Learners to model/represent the first number (63) as 6 bundles of tens and 3 loose straws.



- iii. Learners mention “how many tens and how many units?”
- iv. Learners place the straws (6 bundles and 3 loose straws) in the first row in their respective positions on the mat
- v. Learners represent the second number (18) as 1 bundle of ten straws and 8 loose straws and place them in their positions in the second row of the frame.
- vi. Learners tell “how many Tens and how many ones?”
- vii. Learners draw down loose straws in units' column to the bottom of the addition frame (Learners regroup the 11 straws into 1 bundle and 1 loose ones) and place them in their respective positions
- viii. Again, Learners draw the bundles in tens column at the bottom of the frame.
- ix. Learners count and mention the number of bundles and loose straws at the bottom of the addition frame as the answer to the question as 8 bundles and 1 loose one.

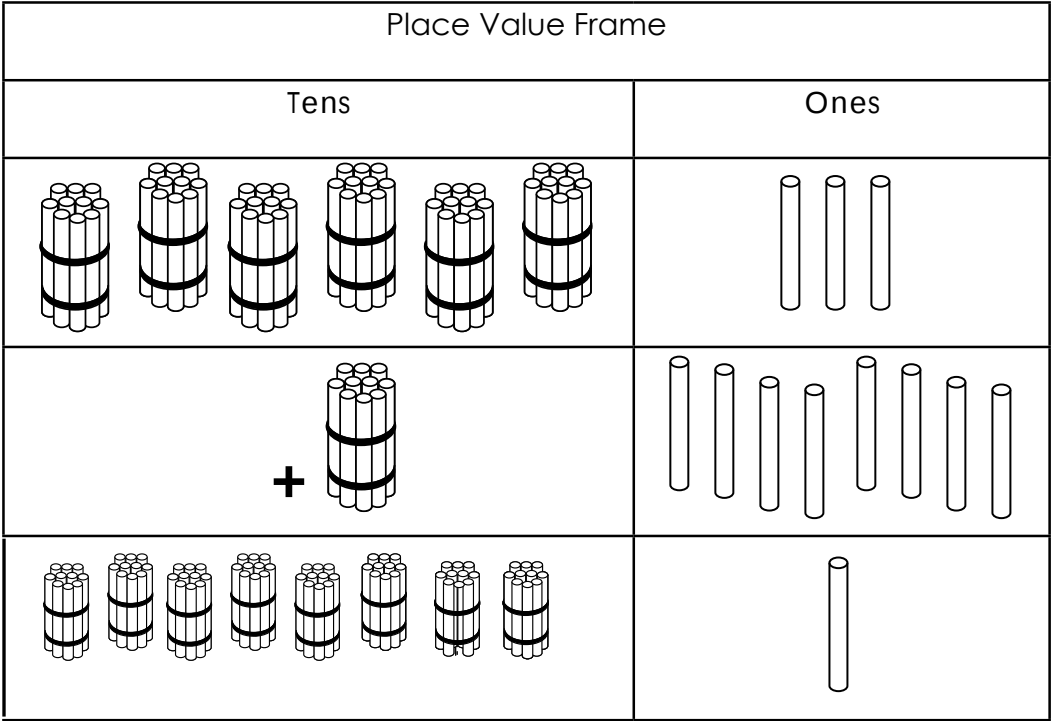


Figure 1: Tens place value frame

- x. Therefore, learners conclude that $63 + 18 = 81$

Note for the teacher

- Put Learners into smaller groups at least 3-4.

- Have Learners do further practice using the above strategy in their groups and emphasis on the regroupings.
- Go round and support Learners.
- Invite Learners to demonstrate strategy to the class.
- Ensure that Learners also solve $18 + 63$ on the frame/mat
- Have Learners do further practice using the above strategy.
- Ensure that learners solve more problems in their exercise books using "Addition frame" E.g. $51 + 28$; $14 + 39$; $48 + 18$ etc.

Reflection/Plenary:

1. During the activity, how many bundles and loose ones did you make?
2. What strategy did you use to solve the word problem?
3. Say one interesting thing you have learnt today?
4. Why did you use addition for the word problem?
5. Apart from using addition in school, where else do we use addition?
6. What happens when you have more than nine straws in the unit column?

ACTIVITY 6C

Addition of whole numbers using addition frame

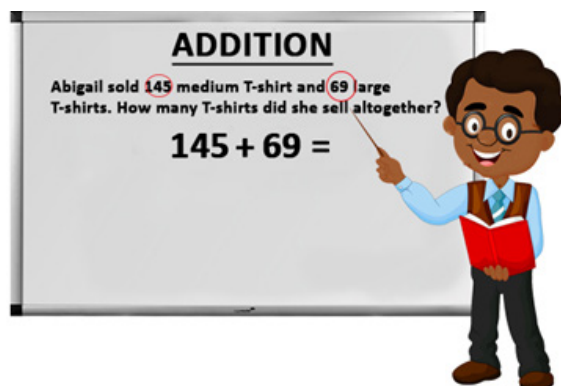
Material required:

Addition Place Value chart.

	Tens	Ones
15		
+ 9		
<u>24</u>		
		

Teacher led Activity:

- Display the addition frame in a way that it is visible to all learners. Assist learners draw the addition frame at the back of their exercise book to be used in their groups.
- Write the following addition problem on the board.



***“Adamu 145 medium T-shirt and 69 large T-shirts.
How many T-shirts did she sell altogether?”***

- Guide learners to write mathematical sentence for the word the problem. Expected response: $145 + 69 = ?$
- Get Learners to model/represent the first number (145) as 1 **bundle** of hundreds, 4 **bundles** of tens and 5 **loose** straws.
- Have Learners mention “how many hundreds, tens and units?” Learners place the straws (1 hundred bundle, 4 bundles of ten straws and the 5 loose straws in the first row of their respective columns) in the addition frame.

Addition Frame (Hundreds)

	Hundreds	Tens	Ones
+			
=			

Figure 6c: Addition frame

Therefore, $145 + 69 = 214$



Learners Activity:

- Put Learners into small groups of 4-5 members.
- Have Learners practice using the above strategy.

Note for the teacher

- Put Learners into smaller groups.
- Have Learners do further practice using the above strategy in their groups.
- Go round and support struggling Learners
- Invite Learners to demonstrate strategy to the class.
- Ensure that Learners also solve $69 + 145$ on the number line
- Have Learners do further practice using the above strategy.

Reflection/Plenary:

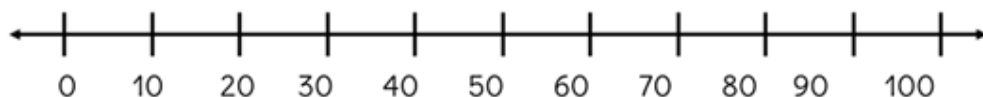
- During the activity, how many bundles and loose ones did you made?
- What strategy did you use to solve the word problem?
- Say one interesting thing you have learnt today?
- Share a situation where you need to communicate an idea of addition.
- Apart from using addition in school, where else do we use addition?
- Name a real life situation where subtraction is used.

ACTIVITY 6D

Addition using the friendly jump Method

Material required:

Chalkboard, place value frame, number line.



PLACE VALUE CHART	
Tens	Ones



Teacher led Activity:

- Revise learners to skip count in 10s and 100s starting from any number,
- Revise learners on how to put digits on the place value chart to create a number and model the number in expanded form.

Example:

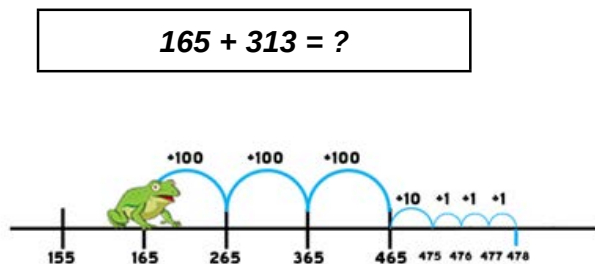
Ten Thousands	Thousands	Hundreds	Tens	Ones
7	0	4	3	5

70435 in expanded form is

$$70435 = 70000 + 0 + 400 + 30 + 5$$

- Write an addition sum. For example, $165 + 313 =$
- Model these two numbers on the place value chart and have learners identify how many tens and ones are in each number (i.e. $165 = 1$ hundred, 6 tens and 5 ones; $313 = 3$ hundreds, 1 ten and 3 units)
- Lead learners to draw the number line/track to include the number points on 165 . From 165 , jump 3 hundreds, to land on 465 , followed by 1

ten to land on 475, then 3 units to land on 478 as shown in the diagram below.



Therefore, $165 + 313 = 478$



Learners Activity:

- i. Write an addition problem for learners. Example $414 + 256 = ?$
- ii. Have learners draw the number line with number points to include 414 in their jotters.
- iii. Have learners identify the second number as 2 hundreds, 5 tens, and 8 ones.
- iv. From the first number (414), have learners make friendly jumps in intervals of 100, 2 times forward (movement to the right) and lands on 614.
- v. From 614 let learners make friendly jumps in an interval of 10, 5 times forward and land on 664.
- vi. From 664, learners make friendly jumps of an interval of 1 units, 8 units forward and land on 672.

Therefore, $414 + 259 = 672$

Note for the teacher

- Learners make two three-digit numbers by selecting the digits randomly and placing them on the chart, talking about the place value of each digit in the numbers created, using the place value tiles to model the number and then writing the expanded form of the number created.
- Learners add the two numbers by using the friendly jumps method to find the sum.
- Learners do further practice using the above strategy in their groups.
- Learners receive teacher's assistance.
- Learners to demonstrate how to use the number line to the class.

Reflection/Plenary:

1. How does using the number line helps you to do the addition?
2. How many hundreds, tens and units were there in the subtraction sentence we use in the activity?
3. How differently can we use the number line to solve the same problem?
4. Share with the class everyday life situation where addition is used?

ACTIVITY 6E

Addition using addition frame

Material required:

Addition Place Value chart.

	Hundreds	Tens	Ones
+			
=			

Figure 6c: Addition frame

Teacher led Activity:

- (a) Display the addition frame chart in a way that it is visible to all learners. Assist learners draw the addition frame at the back of their exercise book to be used in their groups. Pay attention to individual learners having learning disabilities.



Learners Activity:

- i. Learners LOOK ON as teacher writes the following addition problem on the board.



“Miss Comfort collected 1536 eggs on Monday from her farm on Tuesday she collected 452 eggs. How many eggs did she collect altogether?”

- ii. Learners write mathematical sentence for the word problem as $1536 + 452 = ?$
- iii. Learners represent the first number 1536 on the addition frame.
- iv. Learners represent the second number (452) on the same frame under first number as shown below.

ADDITION FRAME

	TH	H	T	O
	1	5	3	6
+		4	5	2
=	1	9	8	8

Figure 6E: Addition frame

Therefore, $1536 + 452 = 1988$

- v. Learners add the digit vertically and place the answer at the answer row.

Note for the teacher

- Put Learners into small groups (4-5 members)
- Go round and assist
- Invite Learners to demonstrate to the class
- Learners can start the addition from the right or left. Do not force learners to start adding from the unit.
- Have learners use commutative property in solving the problem ($a + b = b + a$) for example $1536 + 452$ and $425 + 1536$

Reflection/Plenary:

1. How did you use the addition frame to perform the addition?
2. What challenges did you face using the frame?
3. How did you overcome the challenges?
4. Share your strategies with friends using the addition frame to add numbers.
5. Mention everyday life situations where we use addition.

ACTIVITY 7A

Doing Addition of Whole Numbers Using the Numeral Chart

Material required:

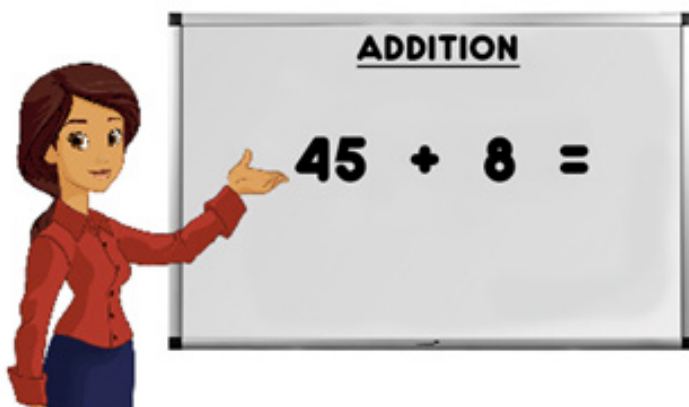
Number Chart:



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Teacher led Activity:

(a) Write addition word problem on the board. For example;



***“The Kumasi STC bus started with 45 passengers from Accra.
8 more “passengers joined at Nkawkaw.
How many passengers are in the bus now?”***

- (b) Display the numeral chart and have Learners work in pairs to determine the patterns on the chart.
- (c) Learners notice that on the numeral chart, moving from left to right is adding on 1 (addition of 1) and moving from top to bottom is plus 10 (addition of 10)

100 Number Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Figure 5: 100 Numeral Chart

(d) Learners start with the first number, for example 45 and move on to the right 8 units to land on 53.

Therefore, Learners conclude that $45 + 8 = 53$



Note for the teacher

- Put Learners into smaller groups.
- Have Learners do further practice using the above strategy in their groups.
- Go round and support Learners.
- Invite Learners to demonstrate strategy to the class.
- Ensure that Learners also solve $8 + 45$ on the number line.
- Have Learners do further practice using the above strategy.

Reflection/Plenary:

1. How did you use the numeral chart to perform the addition?
2. What challenges did you face using the numeral chart?
3. How did you overcome the challenges?
4. Share your strategies with friends using the addition chart to add numbers.
5. Mention everyday life situations where we use addition.

ACTIVITY 7B

Addition of two 2-digit numbers

Material required:

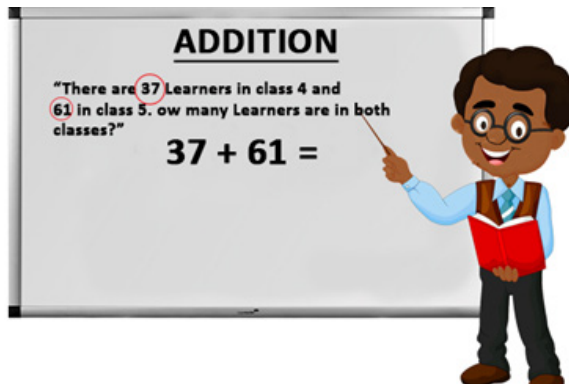
100 Number Chart:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Teacher led Activity:

- Display the numeral chart in a way that it is visible to all learners and they can place a finger on it and read.
- Read the numeral chart in different ways. For example, top to bottom, bottom to top, forward and backward etc.
- As you call out the number names, learners are required to point out the matched numeral on the numeral chart.
- Have Learners work in pairs to determine the patterns on the chart.
- Learners should notice that moving to the right is plus 1 representing Units and moving downwards is plus 10 representing Tens.

Write addition a word problem on the board. For example:



***"There are 37 Learners in class 4 and 61 in class 5.
How many Learners are in both classes?"***



Learners Activity:

- Learners in small groups of 3-4 and guide them to model the word problem in to mathematical expression as $37 + 61 = ?$.
- Learners hold/identify the first number (37), and describe the number of tens and units in the second number (61).
- Learners identify both the 37 and the 61 on the Numeral Chart.
- Learners from the first number (37), move to the right 1 units and land on 38, and then move 6 steps down from 38 and land on 98.
- Learners conclude that; $37 + 61 = 98$.
- Learners move from second number (61) downward 3 units and land on 91 and move right 7 units and land on 98.
- Learners therefore conclude that; $37 + 61 = 98$.

100 Number Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Figure 5: 100 Numeral Chart

Note for the teacher

- Put Learners into smaller groups.
- Have Learners do further practice using the above strategy in their groups. Go round and support struggling Learners
- Invite Learners to demonstrate strategy to the class.
- Ensure that Learners also solve $61 + 37$ on the number line
- Have learners solve more problems in their exercise books using the “Numeral Chart” E.g. $41 + 58$; $44 + 39$; $48 + 27$ etc

Reflection/Plenary:

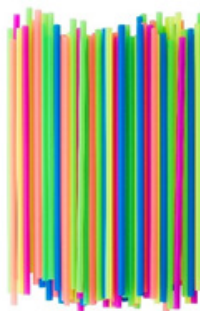
1. How did you use the number chart to perform the addition?
2. What challenges did you face using the number chart?
3. How did you overcome the challenges?
4. Share your strategies with friends using the addition chart to add numbers.
5. Mention everyday life situations where we use addition.

ACTIVITY 7C

Addition of 2 and 3-digit numbers

Material required:

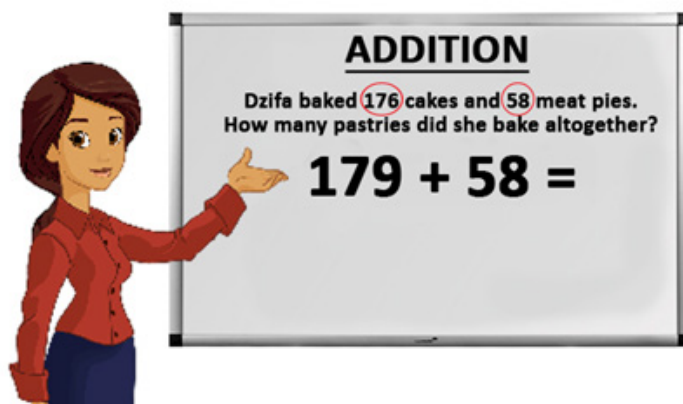
Addition frame/mat, straws/sticks, place value discs.



PLACE VALUE CHART	
Tens	Ones

Teacher led Activity:

(a) Write the following addition problem on the board.



***“Dzifa baked 176 cakes and 58 meat pies.
How many pastries did she bake altogether?”***

- (b) Guide learners to write mathematical sentence for the word the problem.
- (c) Expected response: $176 + 58 = ?$
- (d) Ask Learners to model and represent the first number. Expected response: 1t bundle of 100 straws, 7 bundles of 10 straws and 6 loose straws.

- (e) Have Learners mention “how many hundreds, tens and units?”
- (f) Ask learners to place the straws (1 hundred bundle, 7 bundles of ten straws and the 6 loose straws in the first row of their respective columns) in the addition frame
- (g) Represent the second numeral (58) as 5 bundles of ten straws and 8 loose straws.
- (h) Ask learners to place them in their respective columns in the second row
- (i) Have Learners mention “how many Tens and how many units?”
- (j) Have Learners draw down loose straws in unit column to the bottom of the frame (Learners regroup the 14 straws into 1 bundle and 4 loose ones) and place them under their respective columns
- (k) Again, have Learners draw down the bundles in tens column to the bottom of the frame (Learners regroup the 13 bundles of ten straws into 1 bundle of hundred straws and 3 bundles of ten straws) and place them in their respective columns of the addition frame.
- (l) Have Learners count and mention the number of one hundred bundles as (2), tens bundle as 3 and loose straws as (4) at the bottom of the frame as the answer to the question.
- (m) Therefore, Learners conclude that $176 + 58 = 234$



Learners Activity:

- i. Learners sit in small groups of 4-5 members.
- ii. Learners practice using the above strategy.

Note for the teacher

- Put Learners into smaller groups.
- Have Learners do further practice using the above strategy in their groups.
- Go round and support struggling Learners
- Invite Learners to demonstrate strategy to the class.
- Ensure that Learners also solve $69 + 145$ on the number line
- Have Learners do further practice using the above strategy.

Reflection/Plenary:

1. During the activity, how many bundles and loose ones did you form?
2. What strategy did you use to solve the word problem?

3. Say one interesting thing you have learnt today?
4. Share a situation where you need to communicate an idea of addition.
5. Apart from using addition in school, where else do we use addition?
6. What happens when you have more than nine straws in the unit column?

ACTIVITY 8C

Addition of 2 numbers using number chart

Material required:

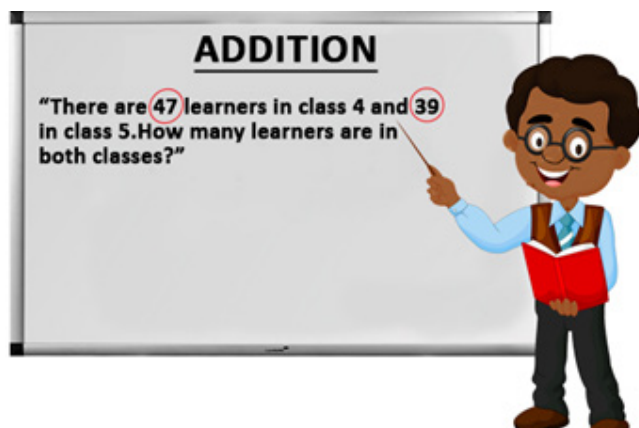
Place value chart, place value disc, addition mat/frame.



PLACE VALUE CHART	
Tens	Ones

Teacher led Activity:

(a) Write addition word problem on the board. For example:



***“There are 47 learners in class 4 and 39 in class 5.
How many learners are in both classes?”***

- (b) Display the number chart and have Learners work in pairs to determine the patterns on the chart.
- (c) Lead learners to notice that moving to the right is plus 1 representing Units and moving downwards is plus 10 representing Tens.
- (d) Ask learners to identify the first number (47), and describe the number of tens and units in the number.
- (e) Locate the first number on the number chart.

- (f) Ask learners to identify the second number (39), and describe the number of tens and units in the number.
- (g) From the first number (47) on the number chart, move 9 units to the right and land on 56, and then move 3 steps down from 56 and land on 86. Alternatively, from 47 on the number chart, move 3 steps down to land on 77. Then, from 77 on the number chart move 9 steps to the right and land on 86.
- (h) Therefore; $47 + 39 = 86$



Learners Activity:

- i. Learners look on as teacher writes addition word problem on the board.
For example:

***“At a meeting, there were 45 women and 52 men.
How many people are at the meeting?”***

- ii. Learners practice using the above strategy.

100 Number Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Figure 5: 100 number chart

Note for the teacher

- Put Learners into smaller groups.
- Have Learners do further practice using the above strategy in their groups.
- Go round and support Learners
- Invite Learners to demonstrate strategy to the class.
- Ensure that Learners also solve $39 + 47$ on the number line
- Have Learners do further practice using the above strategy.

Reflection/Plenary:

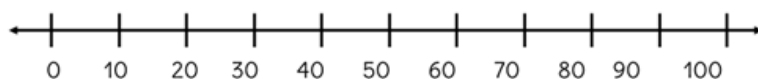
1. How did you use the number chart to perform the addition?
2. What challenges did you face using the number chart?
3. How did you overcome the challenges?
4. Share your strategies with friends using the addition chart to add numbers
5. Mention everyday life situations where we use addition.

ACTIVITY 8E

Addition using Number line

Material required:

Number line.



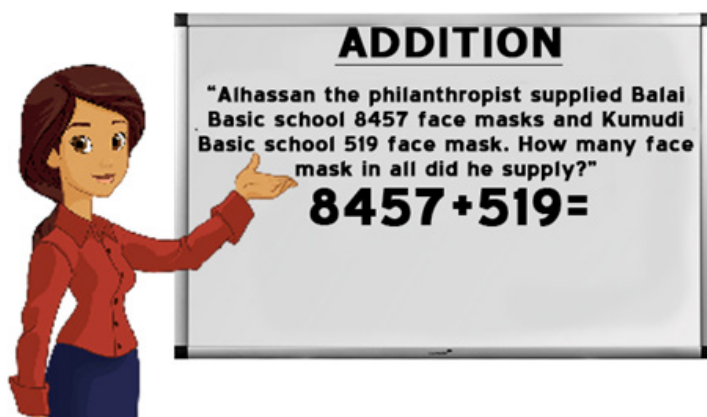
Teacher led Activity:

- (a) Draw a number line on the board or display a picture of the number line.
- (b) Write addition problem involving 4-digit number and a 3- digit number.
- (c) For example $1465 + 383 = ?$
- (d) Help Learners draw the number line with number points including 1400.
Guide learners how to do the movement on the number line



Learners Activity:

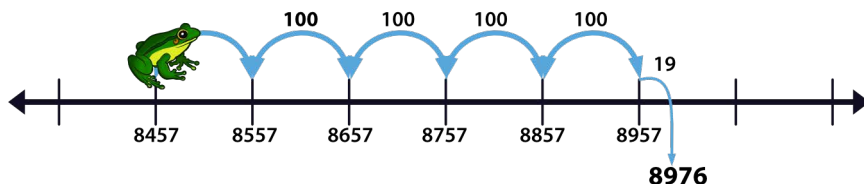
- i. Learners look on as teacher writes the following addition word problem on the board.



“Alhassan the philanthropist supplied Balai Basic school 8457 face masks and Kumudi Basic school 519 face mask. How many face masks in all did he supply?”

- ii. Learners draw the number line with number points to include 8457 in their jotters.

- iii. Learners identify the second number as 5 - hundreds, 1 ten and 9 ones
- iv. Learners make friendly jumps in an interval of 100, 5 times starting from 8457 to land in 8957 (movement to the right/forward)
- v. From 8957, Learners make jumps in an interval of 10, once to land in 8967 (Movement to the right / forward)
- vi. From 8967, Learners make jumps of 5 units to land on 8972 on the number line (show jumps on the number line)
- vii. From 8972, Learners make jumps 2 units, 2 times to land on 8976



Therefore: $8457 + 519 = 8976$

Note for the teacher

- Put Learners into smaller groups.
- Assist Learners to do further practice using the above strategy in their groups.
- Go round and support struggling Learners
- Invite Learners to demonstrate strategy to the class.
- Ensure that Learners also solve $519 + 8457$ on the number line.

Reflection/Plenary:

1. How did you use the number line to perform the addition?
2. What challenges did you face using the number line?
3. How did you overcome the challenges?
4. Share your strategies with friends using the number line to add numbers
5. Mention everyday life situations where we use addition.

ACTIVITY 9D

Addition Using the Expanded Method

Material required:

Chalk board, place value frame, place value tiles.



PLACE VALUE CHART	
Tens	Ones

Teacher led Activity.

- (a) Revise learners on how to put digits on the place value chart to create a number and model the number in expanded form.

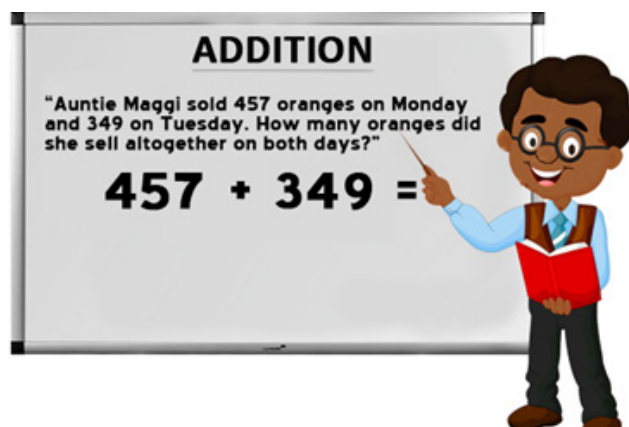
Example

Ten Thousands	Thousands	Hundreds	Tens	Ones

45073 in expanded form is

$$45073 = 40000 + 5000 + 0 + 70 + 3$$

- (b) Write addition word problem on the board. For example:



“Auntie Maggi sold 457 oranges on Monday and 349 on Tuesday. How many oranges did she sell altogether on both days?”



Learners Activity:

- i. Learners write the mathematical statement for the word problem:
 $457 + 349 = ?$
- ii. Learners write the values given in the problem under their corresponding place values (positions) in the place value frame.
- iii. Learners state the number of hundreds, tens and ones in each number and write it in the expanded form. Thus $457 = 400 + 50 + 7$ and $349 = 300 + 40 + 9$.
- iv. Learners add the values with the same place values and write down the answer (regroup into tens of hundreds where need arise)
- v. Learners add and write answer as shown below:

$$\begin{aligned}\text{Thus } 457 &= 400 + 50 + 7 \text{ and } 349 = 300 + 40 + 9 \\ &(400 + 300) + (50 + 40) + (7 + 9) \\ &= 700 + 90 + 16 = 700 + 90 + (10 + 6) \\ &= 700 + (90 + 10) + 6 \\ &= 700 + 100 + 6 \\ &= 800 + 6 \\ &= 806\end{aligned}$$

Note for the teacher

- Help learners make two three-digit numbers by selecting digit randomly and placing them on the chart, talk about the place of each digit in the numbers created, use the place value tiles to model the number and then write the expanded form of the number created.
- Help learners add the two numbers by using the expanded method to find the sum.

Reflection/Plenary:

1. Which numbers were easier or more difficult for you to add?
2. Which two numbers ever made you add them together in your mind?
3. Next time you must add two numbers correctly, what will you do to add correctly?
4. How could mental math help you outside of school?
5. How did you use the decomposition strategy to perform the addition?
6. What challenges did you face using this strategy?
7. How did you overcome the challenges?
8. Share your strategies with friends using the decomposition to add numbers
9. Mention everyday life situations where we use addition.

ACTIVITY 9D

Addition using decomposition

Material required:

Chalk board, place value frame, place value tiles.



PLACE VALUE CHART	
Tens	Ones

Teacher led Activity:

- (a) Revise with learners how to decompose four digits numbers in their expanded form using the place value chart.

For example: $4521 = 4000 + 500 + 20 + 1$ etc.



Learners Activity:

- i. Learners read quietly as teacher writes an addition word problem on the board. For example:

ADDITION

The Electoral commission of Ghana registered 8457 voters in the first cluster and 649 in the second cluster at the Saltpond constituency. How many voters were registered in both clusters?

$8457 + 649 =$



“The Electoral commission of Ghana registered 8457 voters in the first cluster and 649 in the second cluster at the Saltpond constituency. How many voters were registered in both clusters?”

- ii. Learners write the mathematical statement for the word problem: $8457 + 649 =$
- iii. Learners write the values given in the problem under their corresponding place values (positions) in the place value frame.
- iv. Learners state the number of hundreds, tens and ones in each number and write it in the expanded form. Thus $8457 = 8000 + 400 + 50 + 7$ and $649 = 600 + 40 + 9$
- v. Learners add the values with the same place values and write down the answer (regroup into tens or hundreds or thousands where the need arise)
- vi. Learners to add and write answer as shown below:

Thus $8457 = 8000 + 400 + 50 + 7$ and $649 = 600 + 40 + 9$

$$\begin{aligned}
 &8000 + (400 + 600) + (50 + 40) + (7 + 9) \\
 &= (8000 + 1000) + 90 + 16 \\
 &= 9000 + 90 + (10 + 6) \\
 &= 9000 + (90 + 10) + 6 \\
 &= 9000 + 100 + 6 \\
 &= 9000 + 100 + 6 \\
 &= 9106
 \end{aligned}$$



Note for the teacher

- Put Learners into smaller groups.
- Have Learners do further practice using the above strategy in their groups.
- Go round and support struggling Learners
- Invite Learners to demonstrate strategy to the class.
- Ensure that Learners also solve $349 + 457$ on the number line.

Reflection/Plenary:

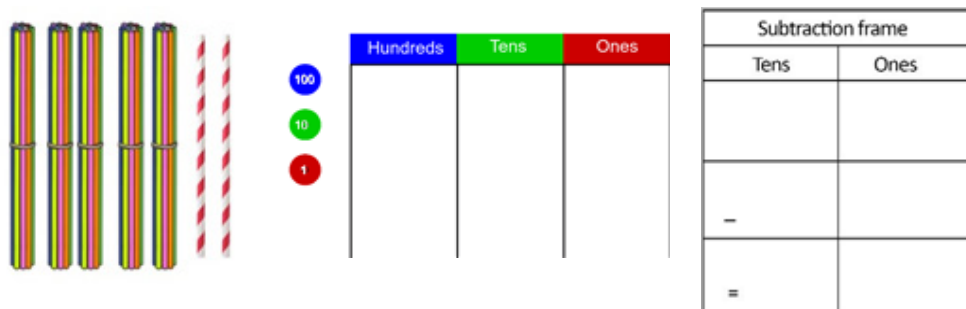
1. Were some numbers easier/more difficult for you to add? Which ones?
2. How did you use the decomposition strategy to perform the addition?
3. Mention everyday life situations where we use addition.

ACTIVITY 10A

Subtraction of Whole Numbers Using the Subtraction Frame

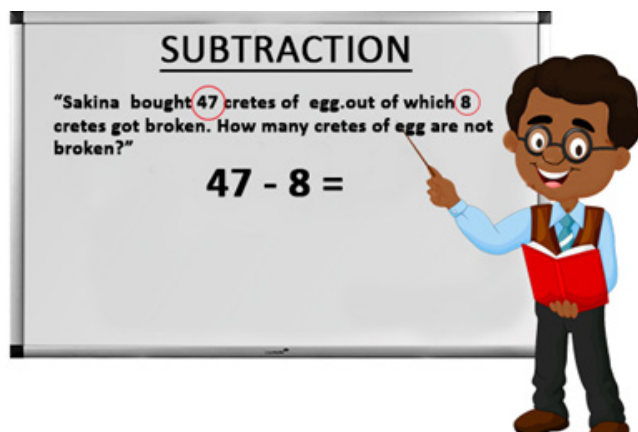
Material required:

Subtraction frame, straws (bundles and loose): hundreds and thousands subtraction frames.



Teacher led Activity:

(a) Write a subtraction problem on the board. For example:



"Sakina bought 47 crates of egg out of which 8 crates got broken. How many crates of egg are not broken?"

Learners Activity:

- Learners write the mathematical statement for the word problem:
 $47 - 8 = ?$
- Learners represent the first number (47) as 4 bundles of tens and 7 loose straws in the first row of the subtraction frame
- loose straws in the first row of the subtraction frame



- iv. Learners mention “how many tens and how many units?”
- v. Learners represent the second number (8) as 8 loose straws in the second row.
- vi. Learners match loose straws in unit column, regroup and continue matching until the units in the second row gets finished.
- vii. Learners draw down the remaining unmatched straws in the first row to the bottom of the frame.
- viii. Learners match the bundles in the tens' column, and draw down the remaining unmatched bundles to the bottom.
- ix. Learners count the bundles and loose ones at the bottom of the frame as the answer.

Subtraction
Frame
(Tens & Ones)

	Tens	Ones
-		
=		

Figure 10a: Tens subtraction frame

Therefore $47 - 8 = 39$



Note for the teacher

- Put Learners into small groups.
- Assist Learners to do further practice using the above strategy in their groups.
- Go round and assist.
- Invite 3 Learners to demonstrate the activity to the class.

Reflection/Plenary:

1. How could mental mathematics help you outside of the school?
2. How many tens and units were there in the subtraction sentence we use in the activity?
3. Share with the class everyday life situation when subtraction is used.
4. What would you do to ensure you improve on your strategy for doing subtraction?

ACTIVITY 10B

Subtraction of two 2-digit numbers

Material required:

Tens subtraction frame, straws (bundles in ten straws and loose ones): thousands and hundreds subtraction mat, and 100 Numeral Chart.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

thousands	hundreds	tens	ones

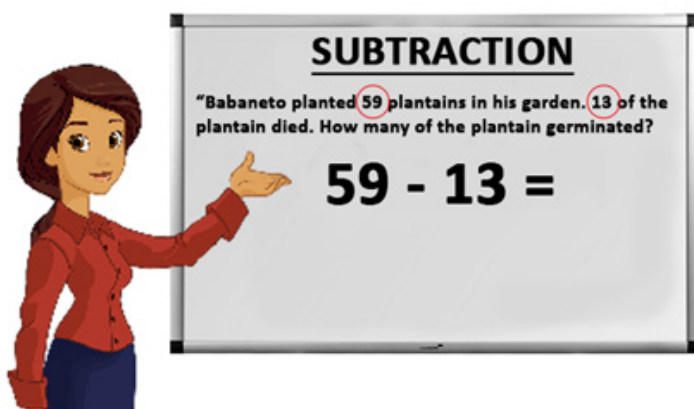
_____ + _____ + _____ + _____

Hundreds	Tens	Ones

100
10
1

Teacher led Activity:

(a) Write a subtraction problem on the board. For example:



***“Adamu sold 63 chairs on Monday and 13 on Tuesday.
How many chairs did he sell on both days?”***

- Guide the Learners to write mathematical expression for the word problem as $59 - 13 = ?$
- Draw the Subtraction frame on the writing board and ask learners to draw same on the floor in their respective groups. Instruct them to perform the following activities.
- Ask Learners to mention “how many tens and how many ones.



Learners Activity:

- i. Learners to write the mathematical statement for the word problem as:
 $59 - 13 = ?$
- ii. Learners in their various groups, draw the Subtraction Frame on the floor.
- iii. Learners represent the first number (59) as 5 bundles of tens and 9 loose straws in the first row of the subtraction frame.
- iv. Learners mention “how many tens and how many ones?”
- v. Learners represent the second number (13) as 1 bundle of tens and 3 loose straws in the second row.
- vi. Learners match loose straws in ones column, regroup and continue matching until the ones in the second row gets finished
- vii. Learners draw down the remaining unmatched straws in the first row to the bottom of the frame.
- viii. Learners match the bundles in the tens column, and draw down the remaining unmatched bundles to the bottom.
- ix. Learners count the bundles and loose ones at the bottom of the frame as the answer.

Subtraction Frame (Tens & Ones)

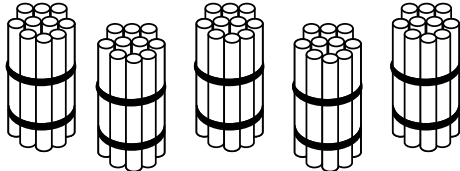
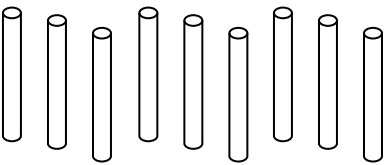
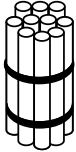
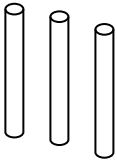
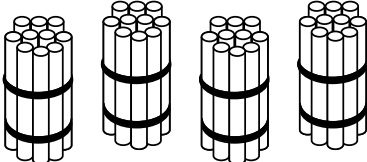
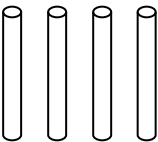
Tens	Ones
	
 -	
 =	

Figure 10b: Tens subtraction frame

Therefore $59 - 13 = 46$

Note for the teacher

- Put Learners into smaller groups at least 3-4.
- Get Learners to do further practice using the above strategy in their groups and emphasis on the regroupings.
- Go round and support Learners
- Invite Learners to demonstrate strategy to the class.
- Ensure that learners solve more problems in their exercise books using "Subtraction frame" E.g. $51 - 28$; $39 - 14$; $48 - 18$ etc.

Reflection/Plenary:

1. How many tens and units were there in the subtraction sentence we used in the activity?
2. Share with the class everyday life situation when the idea of subtraction is used.
3. What would you do to ensure you improve on your strategy for finding answers to subtraction problem?

ACTIVITY 10C

Subtraction of a 2-digit from a 3-digit number

Material required:

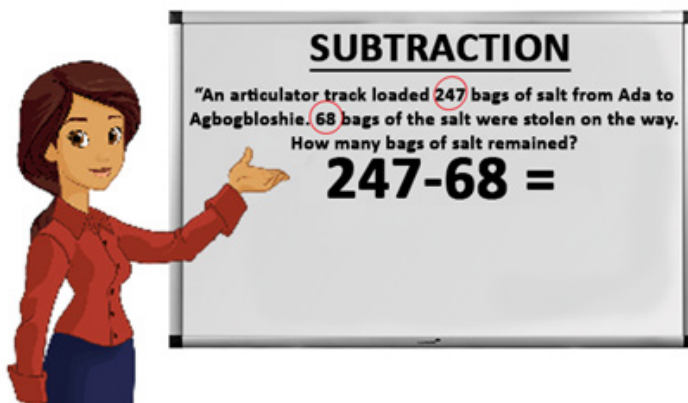
Subtraction frame, sticks/straws.



Subtraction frame	
Tens	Ones
-	
=	

Teacher led Activity:

(a) Write a subtraction problem on the board. For example:



***“An articulator track loaded 247 bags of salt from Ada to Agbogbloshie.
68 bags of the salt were stolen on the way.
How many bags of salt remained?”***

- (b) Ask learners to write the mathematical statement for the word problem:
Expected response: $247 - 68 = ?$
- (c) Get Learners to represent or model the first number (247) as 2 bundles of hundreds, 4 bundles of tens and 7 loose straws in the first row of the subtraction frame.
- (d) Let learners answer the question: “how many hundreds, tens and ones?”

- (e) Assist learners represent or model the second number (68) as 6 bundle of tens and 8 loose straws in the second row.
- (f) Guide learners to match loose straws in ones column, regroup (decompose 1 ten bundle from the 4 bundles into loose straws and leave 3 bundles in the tens column of the first row) and continue matching until the ones in the second row gets finished.
- (g) Let learners draw the remaining unmatched straws (9) in the ones column to the bottom of the frame.
- (h) Assist learners to match the bundles in tens column, regroup (decompose 1 hundred bundle from the 2 bundles into bundles of ten and leave 1 bundle in the hundreds column of the first row) and continue matching until the tens in the second row gets finished.
- (i) Get learners to draw down the remaining unmatched bundles (7) in the tens column to the bottom of the frame.
- (j) Assist learners to match the bundles in the tens column and draw down any remaining unmatched bundles to the bottom of the frame.
- (k) Ask learners to count the bundles and loose ones at the bottom of the frame as the answer.

Subtraction Frame
 (Hundreds, Tens & Ones)

	Hundreds	Tens	Ones
-			
=			

Figure 10b: Subtraction frame

Therefore $247 - 68 = 179$

Learners Activity:

- i. Learners sit in smaller groups
- ii. Learners do similar questions using the strategy



Note for the teacher

- Put Learners into small groups (2-3members).
- Have Learners do further practice using the above strategy in their groups.
- Go round and assist.
- Invite learners to demonstrate to the class.

Reflection/Plenary:

1. How could the mental math we used today help you outside of school?
2. How many tens and units were there in the subtraction sentence we use in the activity?
3. Share with the class everyday life situation where subtraction is used?
4. What would you do to ensure you improve on your strategy for doing subtraction?

ACTIVITY 10D

Subtraction using decomposition/expanded method

Material required:

Chalk board, place value frame, place value tiles.

PLACE VALUE CHART	
Tens	Ones



Teacher led Activity:

- (a) Revise learners to skip count in 100s and 10s starting from any number,
- (b) Revise learners on how to put digits on the place value chart to create a number and model the number in expanded form.
- (c) Write subtraction word problem on the board. For example: $457 - 349 = ?$

Example:

Ten Thousands	Thousands	Hundreds	Tens	Ones
4	5	0	7	3

70435 in expanded form is

$$45073 = 40000 + 5000 + 0 + 70 + 3$$



Learners Activity:

- i. Learners write the values given in the problem under their corresponding place values (positions) in the place value frame.
- ii. Learners state the number of hundreds, tens and ones in each number and write it in the expanded form. Thus $457 = 400 + 50 + 7$ and $300 + 40 + 9$

- iii. Learners subtract the same place values and write down the answer (regroup into tens of hundreds where need arise)

Thus $427 = 400 + 20 + 7$ and $349 = 300 + 40 + 9$

Since $7 - 9$ is not possible learners regroup 427 as $[400 + 10 + (10 + 7)]$
 $= 400 + 10 + (17)$ Now $17 - 9 = 8^*$. We now have $400 + 10 + 8$

Next, we find $10 - 40$ which is also impossible, hence we regroup one of the hundreds in the 400 to obtain 11 tens and 3 hundreds
 $[300 + (100 + 10) + 8]$

So, $11 \text{ tens} - 4 \text{ tens} = 7 \text{ tens} = 70^*$. We now have $300 + 70 + 8$ Finally, we find $300 - 300 = 0$ which is possible leaving us with 78.

Hence $427 - 349 = 78$

$$\begin{aligned} &= (400 + 20 + 7) - (300 + 40 + 9) \\ &= (400 + 10 + 17) - (300 + 40 + 9) \\ &= (300 + 110 + 17) - (300 + 40 + 9) \\ &= (300 - 300) + (70 + 40 - 40) + (8 + 9 - 9) \\ &= 0 + 70 + 8 \\ &= 78 \end{aligned}$$

Note for the teacher

- Let learners make two three-digit numbers by selecting digit randomly and placing them on the chart, talk about the place of each digit in the numbers created, use the place value tiles to model the number and then write the expanded form of the number created.
- Get learners to subtract the smaller numbers from the bigger using the expanded method to find the sum.

Reflection/Plenary:

1. Which numbers were easier or more difficult for you to subtract?
2. Which numbers did you ever had to add together in your mind?
3. What will you do to add two numbers correctly?
4. How could mental math help you outside of school?
5. How did you use the decomposition strategy to perform the subtraction?
6. What challenges did you face using this strategy?
7. How did you overcome the challenges?
8. Share your strategies with friends using the method of decomposition to subtract numbers.
9. Mention two (2) everyday life situations where we you use subtraction.

ACTIVITY 10E

Subtraction using frame

Material required:

Subtraction Place Value Frame or chart.

Subtraction frame	
Tens	Ones
-	
=	

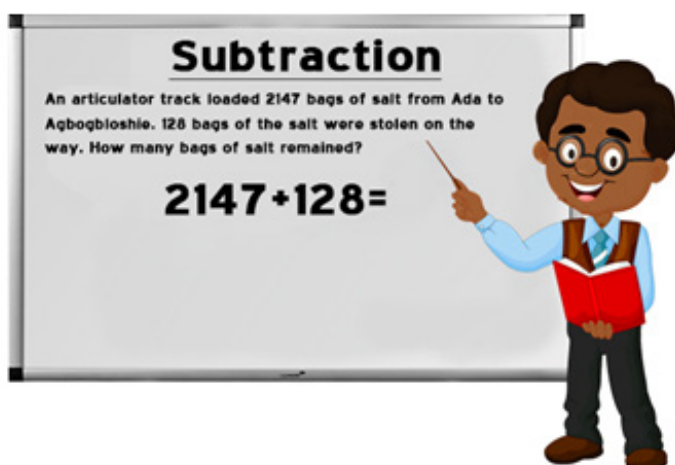
Teacher led Activity:

- (a) Display the subtraction frame in a way that it is visible to all learners.
- (a) Assist learners draw the subtraction frame at the back of their exercise book to be used in their groups.
- (a) Pay attention to individual learners having learning challenges.



Learners Activity:

- i. Write a subtraction problem on the board. For example:



“An articulator truck loaded 2147 bags of salt from Ada to Agbogbloshie. 128 bags of the salt were stolen on the way. How many bags of salt remained?”

- ii. Learners write the mathematical statement for the word problem:
 $2147 - 128 = ?$
- iii. Learners represent or model the first number (2147) as 2 bundles of thousand, 1 bundle of hundred, 4 bundles of ten and 7 loose straws in the first row on the subtraction frame.
- iv. Learners mention “how many thousands, hundreds, tens and ones?”
- v. Learners represent or model the second number (128) as 1 bundle of thousand 2 bundle of tens and 8 loose straws in the second row.
- vi. Learners match loose straws in ones column, regroup (decompose 1 ten bundle from the 4 bundles into loose straws and leave 3 bundles in the tens column of the first row) and continue matching until the ones in the second row gets finished
- vii. Learners write down the remaining unmatched straws (9) in the ones column to the bottom of the frame (answer place).
- viii. Learners match the bundles in tens column, continue matching until the tens in the second row gets finished
- ix. Learners write the remaining unmatched bundles (1) in the tens column to the bottom of the frame (answer place).
- x. Learners match the bundles in the hundred column and write down any remaining unmatched bundles (0) to the bottom of the frame
- xi. Learners write down the 2 bundles of thousand in the thousands column to the answer place since there is no bundle to match from the bottom row. This is 2
- xii. Learners count the bundles and loose ones at the bottom of the frame as the answer as 2019. Therefore $2147 - 128 = 2019$.

Subtraction Frame
(Thousands, Hundreds, Tens & Ones)

	Thousands	Hundreds	Tens	Ones
	2	1	4	7
-		1	2	8
=	2	0	1	9

**Note for the teacher**

- Put Learners into small groups (2-3members).
- Have Learners do further practice using the above strategy in their groups.
- Go round and assist.
- Invite learners to demonstrate to the class.

Reflection/Plenary:

1. How could the mental math we used today help you outside of school?
2. How many tens and units were there in the subtraction sentence we use in the activity?
3. Share with the class everyday life situation where subtraction is used?
4. What would you do to ensure you improve on your strategy for doing subtraction?

ACTIVITY 11A

Subtraction of Whole Numbers Using the Number Chart

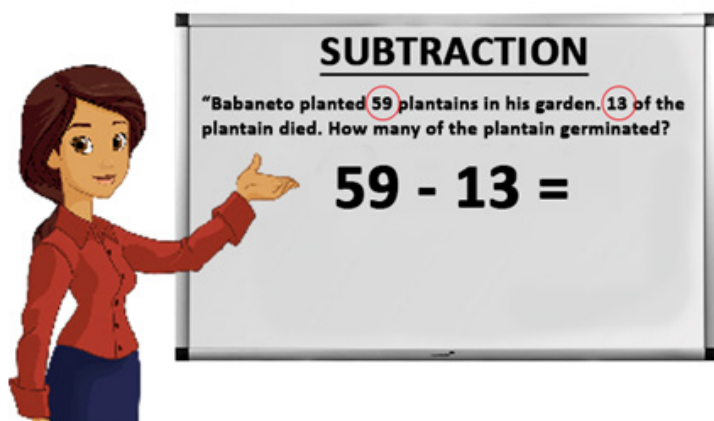
Material required:

100 Numeral Chart.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Teacher led Activity:

- (a) Display the numeral chart in a way that it is visible to all learners and they can place a finger on it and read. Read the number chart in different ways. For example, top to bottom, bottom to top, forward and backward etc. As you call out the number names, learners are required to point to the numerals on the numeral chart. Let Learners work in pairs to determine the patterns on the chart. Learners observed that movement to left is less 1 and moving upwards is 10 less.
- (b) Write a subtraction word problem on the writing board: For example:



“Babaneto planted 59 plantains in his garden. 13 of the plantain died. How many of the plantains germinated?”



Learners Activity:

- Learners into small groups of 3-4 and guide them to model the word problem into mathematical expression as $59 - 13 = ?$
- Learners write the mathematical statement for the word problem: $59 - 13 = ?$
- Learners hold or identify the first number (59), and describe the number of tens and units in the second number (13) as 1 ten and 3 ones.
- Learners start from the first number (59) and move backwards 3 units to land on 56 and then move upwards 1 unit to land on 46.

100 Number Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Figure 5: 100 Numeral Chart

Therefore, $59 - 13 = 46$



Note for the teacher

- Put Learners into small groups.
- Let Learners do further practice using the above strategy in their groups.
- Go round and assist.
- Invite Learners to demonstrate the use of the strategy to the class.
- Ensure that learners solve more problems in their exercise books using "Subtraction frame" E.g. $51 - 28$; $39 - 14$; $48 - 18$ etc.

Reflection/Plenary:

1. How does using the number chart helps you to do the subtraction?
2. How many tens and units were there in the subtraction sentence we use in the activity?
3. Share with the class everyday life situation where subtraction is used?
4. What would you do to ensure you improve on your strategy for doing subtraction?

ACTIVITY 11B

Subtraction of two 2-digit numbers

Material required:

Tens Subtraction frame, straws (bundles and loose): hundreds and thousands Subtraction mat and 100 Number Chart.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

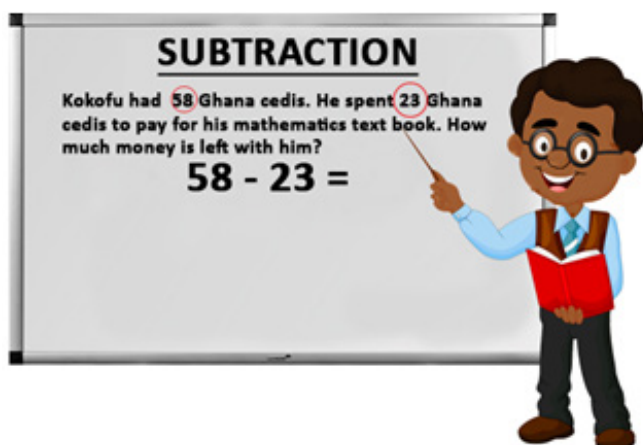
thousands	hundreds	tens	ones

— + — + — + —

	Hundreds	Tens	Ones
100			
10			
1			

Teacher led Activity:

- Display the numeral chart in a way that it is visible to all learners and they can place a finger on it and read. Call out number named of numerals on the numeral chart in different ways. For example, top to bottom, bottom to top, forward and backward etc. As you call out the number names, learners are required take turns to point out the numeral on the numeral chart. Have Learners work in pairs to determine the patterns on the chart. Learners observed that movement to left is less 1 and moving upwards is 10 less.
- Write a subtraction word problem on the board using the example:



"Kokofu had GH ₵58 . He spent GH₵ 23 to pay for his mathematics text book. How much will he be left with?"

- (c) Have participants start from the first number (58) and move to the left or backwards 3 units as the ones of the second number (23) to land on 55. From 55 participants move 2 steps upwards as tens of the second number (23) to land on 35. Therefore, $58 - 23 = 35$.
- (d) Get Learners to conclude that “Kokofu will be left with GH ₵35”.

100 Number Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45			48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Figure 11a: 100 number chart



Note for the teacher

- Put Learners into small groups.
- Have Learners do further practice using the above strategy in their groups.
- Go round and assist the struggling learners.
- Invite Learners to demonstrate the use of the strategy to the class.

Reflection/Plenary:

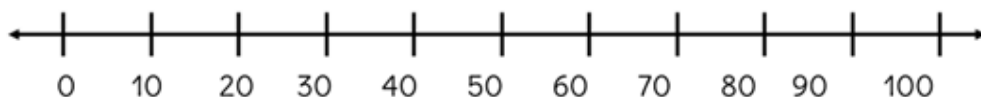
1. How did the use of the numeral chart helped you to do the subtraction?
2. How many tens and units were there in the subtrahend of the subtraction sentence we used in the activity?
3. Which everyday life situation is subtraction used?
4. What would you do to ensure you improve on your strategy for doing subtraction?

ACTIVITY 11D1

Solving Everyday Life Problems

Material required:

Chalkboard, place value frame, number line.



PLACE VALUE CHART	
Tens	Ones



Teacher led Activity:

- (a) Revise learners to skip counts in 10s and 100s for numbers within 1-1000, starting from any number.
- (b) Revise with learners on how to put digits in a given numeral on the place value chart to create a number and also write the number (numeral) in expanded form.

Example:

Ten Thousands	Thousands	Hundreds	Tens	Ones
7	0	4	3	5

70435 in expanded form is

$$70435 = 70000 + 0 + 400 + 30 + 5$$

- (c) Write addition word problem on the board. For example:

“Two groups of workers are on an orange farm. 45 takes care of the weeds and 52 are responsible for harvesting the fruits. How many workers are working on the farm altogether?”

- (d) Through questioning, lead learners to make meaning out of the

question.

- What has been given in the problem?
Expected response(s): two groups of workers, 45 responsible for weeding, and 52 responsible for harvesting the oranges.
- What is/are the key requirement in the problem?
Expected response(s): "How many workers are working on the farm?".
- What to do to get the answer?
Expected response(s): "Put all the persons working on the farm together to know the sum".
- What mathematical operation is appropriate to use?
Expected response(s): "Addition".

(e) Guide learners to use different addition strategies including the use of the number chart, friendly jumps, expanded form etc. To solve the problem. For example:

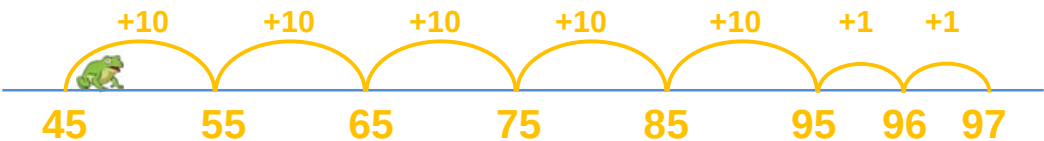
Method 1. Using the numeral chart

100 Number Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Figure 5: 100 number chart

Method 2. Using the number line

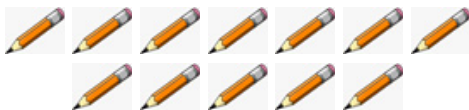


(f) Assist learners to create story problems such as the ones shown below.
Discuss and solve the problems and with them using any strategies of their choice.

A pack of pens contains 6 pens.
How many pens are in 5 packs?



Esi has 95 pencils, Afua has 40 pencils. What is the difference?



A paperclip is made of 10cm of wire. How much wire would I need for 6 paperclips?



There are 127,70 flew away.
How many are left?



A shop has 135 🍊. I bought 29.
How many 🍊 are left in the shop?

I have 95 pesewas
I spend 20 pesewas
How much money do I have left?



There are 50 toes in the pool.
Each person has 10 toes. How many people are in the pool?



Mrs. Adu brought 4 boxes of equal cupcakes to class. There are 16 cupcakes altogether.
How many cupcakes were in each box?



Mansa brought 40 mangoes to share among her 5 friends. How many mangoes will each friend receive?





Note for the teacher

- Put learners into small groups.
- Have learners do further practice using the any strategy of their choice and ensure that they explain their reasoning
- Go round and assist.
- Invite Learners to demonstrate how to use their strategies to solve the problem.
- Lead Learners to make two three-digit numbers by selecting digits randomly and placing them on the chart, talk about the place of each digit in the numbers created, use the place value tiles to model the number and then write the expanded form of the number created.
- Guide Learners subtract the smaller numbers from the bigger using the expanded method to find the sum.

Reflection/Plenary:

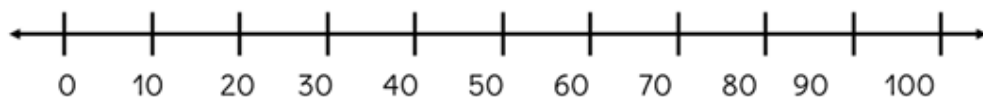
1. Which problems were easier or more difficult for you to solve?
2. Have you ever had to add numbers together in your mind, outside the school?
3. Next time you are to add two numbers correctly, what will you do to add them correctly?
4. How mental mathematics could help you outside of school?
5. How did you use the decomposition strategy to perform the subtraction?
6. What challenges did you face using this strategy?
7. How did you overcome the challenges?
8. Share your strategies with friends using the decomposition to subtract numbers
9. Mention one (1) everyday life situations where we use subtraction.

CTIVITY 11D2

Solving Everyday Life Problems

Material required:

Chalkboard, place value frame, number line.



PLACE VALUE CHART	
Tens	Ones



Teacher led Activity:

- (a) Revise with Learners to skip count in 10s and 100s within 1-1000, starting from any number.
- (b) Revise with Learners on how to put digits on the place value chart to create a number and model the number in expanded form.

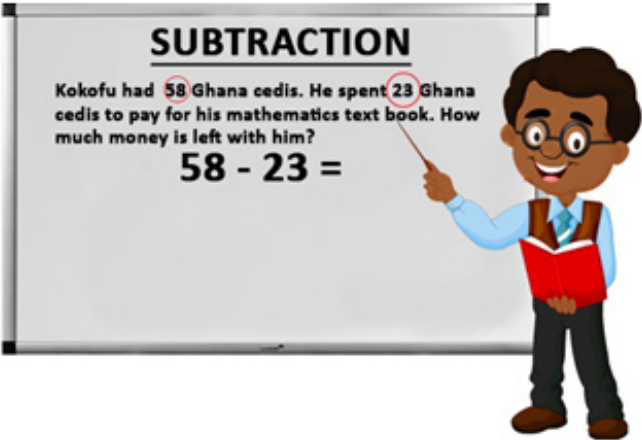
Example:

Ten Thousands	Thousands	Hundreds	Tens	Ones
7	0	4	3	5

70435 in expanded form is

$$70435 = 70000 + 0 + 400 + 30 + 5$$

(c) Write addition word problem on the board.
 For example:



“Kokofu had GH ¢58 . He spent GH¢ 23 to pay for his mathematics text book. How much will he be left with?”



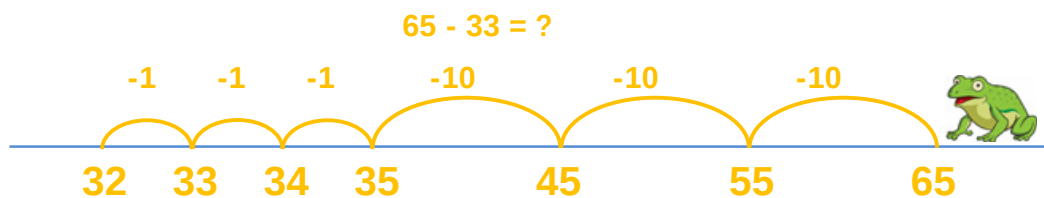
Lead Learners to find out:

- What has been given in the problem? – “amount of money Kokofu had = GH¢65 and amount spent = GH¢23”
- What is the key question in the problem? – “how much was left?” or “What change he will get?”.
- What do you have to do to get the answer? – take away the amount spent from the money in hand
- What mathematical operation is appropriate to use – (subtracting)
- Guide learners to use different subtraction strategies including the use of the number chart, friendly jumps, expanded firm etc. For example:
 - on the number chart

100 Number Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45			48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Figure 11a: 100 number chart



Therefore, $65 - 33 = 32$



Learners Activity:

- i. Learners create story problems such as the ones below and discuss the problems and solve using any strategies of their choice.

A pack of pens contains 6 pens.
How many pens are in 5 packs?



Esi has 95 pencils, Afua has 40 pencils. What is the difference?



A paperclip is made of 10cm of wire. How much wire would I need for 6 paperclips?



There are 127 70 flew away.
How many are left?



A shop has 135 bought 29.
How many are left in the shop?

I have 95 pesewas
I spend 20 pesewas
How much money do I have left?



There are 50 toes in the pool.
Each person has 10 toes. How many people are in the pool?



Mrs. Adu brought 4 boxes of equal cupcakes to class. There are 16 cupcakes altogether. How many cupcakes were in each box?



Mansa brought 40 mangoes to share among her 5 friends. How many mangoes will each friend receive?



Note for the teacher

- Let Learners do further practice using the any strategy of their choice and ensure that they explain their thinking.
- Go around and assist Learners in difficulty.
- Invite learners to demonstrate how to use their strategies to solve the problem.
- Get learners to make two three-digit numbers by selecting the digits randomly and placing them on the chart, talk about the place of each digit in the numbers created, use the place value tiles to model the number and then write the expanded form of the number created
- Have learners subtract the smaller numbers from the bigger using the expanded method to find the sum.

Reflection/Plenary:

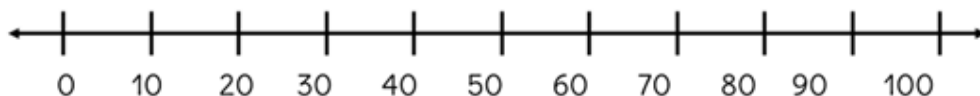
1. Were some problems easier/more difficult for you to solve? Which ones?
2. Have you ever had to add numbers together in your mind, outside of school?
3. Next time you must add two numbers correctly, what will you do to add correctly.
4. How could mental mathematics help you outside the school?
5. How did you use the decomposition strategy to perform the subtraction?
6. How did you overcome the challenges?
7. Share your strategies with friends using the decomposition to subtract numbers.
8. Mention everyday life situations where we use subtraction.

ACTIVITY 12C

Subtraction of a 2-digit from a 3-digit number

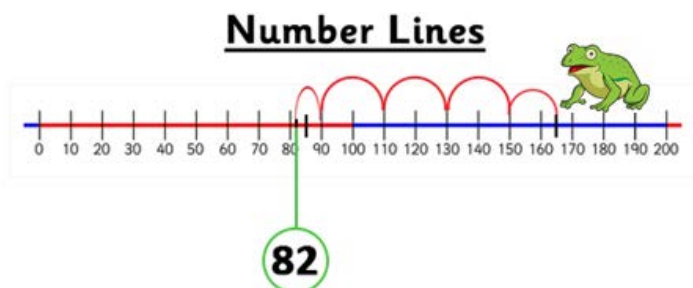
Material required:

Number line.



Teacher led Activity:

- Draw a number line on the board or display a picture of the number line.
- Write a subtraction problem involving 3-digit number and a 2- digit number. For example $165 - 83 = ?$
- Lead Learners to draw the number line with number points including 165.
- Starting from 165, get Learners to identify the second number as 8 tens and 3 ones and make friendly jumps of 8 tens backwards (to the left) and land on 85
- From 85, lead learners to make friendly jumps of 3 units backward/left and land on 82 (show jumps on the number line)



Therefore, $165 - 83 = 82$



Learners Activity:

- Learners solve similar questions using the number line.

Note for the teacher

- Put Learners into small groups.
- Let Learners do further practice using the above strategy in their groups.
- Go round and assist.
- Invite Learners to demonstrate how to use the number line to the class.

Reflection/Plenary:

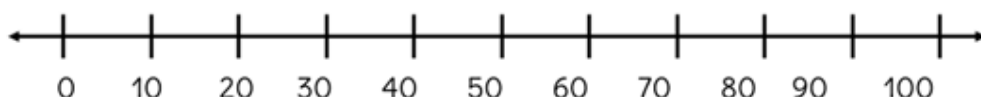
1. How the use of the number line did helped you to do the subtraction?
2. How many hundreds, tens and units were in the minuend of the subtraction sentence used in the activity?
3. How differently can we use the number line to solve the same problem?
4. What everyday life situation involving subtraction would you share with your mates?
5. What would you do to ensure you improve on your strategy for doing subtraction?

ACTIVITY 12D

Subtraction using friendly jumps

Material required:

Chalkboard, place value frame, number line.



PLACE VALUE CHART	
Tens	Ones



Teacher led Activity:

- Revise with learners to skip count in 10s and 100s starting from any number,
- Revise with learners on how to put digits of a given numeral on the place value chart to create a number and model the number in expanded form.

Example:

Ten Thousands	Thousands	Hundreds	Tens	Ones
7	0	4	3	5

70435 in expanded form is

$$70435 = 70000 + 0 + 400 + 30 + 5$$



Learners Activity:

- As learners look on write on the writing board a subtraction sentence involving two 2-digit numbers. For example $325 - 141 = ?$

- ii. Learners draw the number line with number points to include 325.
- iii. From 325, learners identify the second number as 1 hundred, 4 tens and 1 unit and make friendly jumps of 1 hundreds backwards (to the left) to land on 225, 4 tens further backwards (to the left) to land on 185 and 1 backward (still to the left) unit to land on 184.



Therefore, $325 - 141 = 184$



Note for the teacher

- Get learners make two three-digit numbers by selecting digit randomly and placing them on the chart, talk about the place of each digit in the numbers created, use the place value tiles to model the number and then write the expanded form of the number created.
- Let learners subtract the smaller numbers from the bigger ones using the expanded method to find the difference.

Reflection/Plenary:

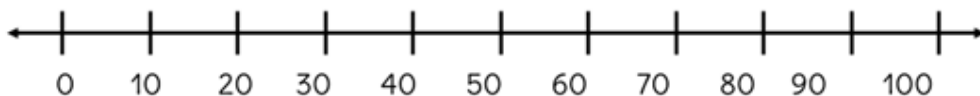
1. Were some numbers easier or more difficult for you to subtract?
Which ones?
2. Have you ever had to add numbers together in your mind, outside of school?
3. Next time you must add two numbers correctly, what will you do to add correctly?
4. How could mental math help you outside of school?
5. How did you use the decomposition strategy to perform the subtraction?
6. What challenges did you face using this strategy?
7. How did you overcome the challenges?
8. Share your strategies with friends using the decomposition to subtract numbers.
9. Mention everyday life situations where we use subtraction.

ACTIVITY 12E

Subtraction using Number line

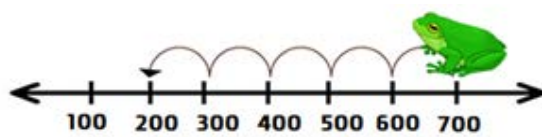
Material required:

Number line



Teacher led Activity:

- (a) Draw a number line on the board with equal interval calibration. Ask learners to draw their number line in their exercise book. Look at the example below:

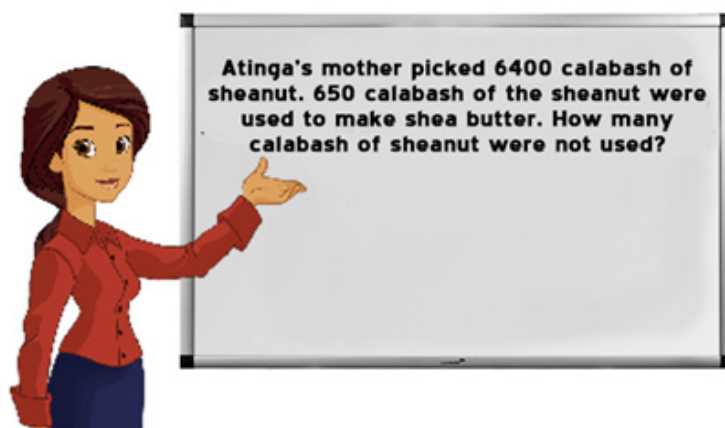


- (b) Check individual learners' number line and do correction before starting the operations on the number line. Take care of individual learning disabilities.



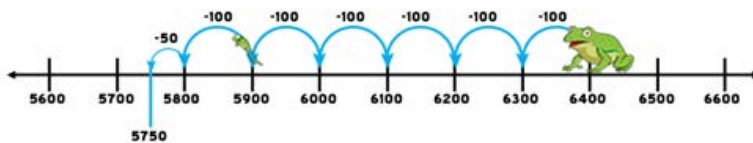
Learners Activity:

- i. Learners observe as the teacher writes a subtraction problem on the board.



“Atinga’s mother picked 6400 calabash of sheanusts. 650 calabash of the sheanuts were used to make sheanuts butter. How many calabash of sheanuts were not used?”

- ii. Learners draw the number line with number points to include 6400 in their jotter.
 - iii. Learners identify the second number as 6 hundreds, 0 ten and 0 one
 - iv. Learners make friendly jumps in an interval of 100, 6 times from 6400 backwards (movement to the left) to land on 5800
 - v. From 5800 learners make friendly jumps in an interval of 50, and land on 5750
 - vi. Learners make reference 6 times 100 friendly jumps backwards as 600 and 50 interval friendly jump to rest 5750 on the number line make 650 from the 6400 (show jumps on the number line).
- Therefore, $6400 - 650 = 5750$.



Note for the teacher

- Put learners into small groups.
- Get learners to do further practice using number line strategy in their groups.
- Go round and assist learners having learning disabilities.
- Invite learners to demonstrate how to use the number line to solve subtraction problems in the class.

Reflection/Plenary:

1. How does using the number line help you to solve the subtraction?
2. How many hundreds and tens were there in the subtraction sentence we use in the activity?
3. How differently can we use the number line to solve the same problem?
4. Share with the class everyday life situation where subtraction is used?
5. What would you do to ensure you improve on your strategy for doing subtraction?

ACTIVITY 13E

Subtraction Using the Decomposition Method

Material required:

Ten-Thousand Place Value Frame, Chalk Board.

PLACE VALUE CHART				
Ten Thousands	Thousands	Hundreds	Tens	Ones
4	5	0	7	3

Teacher led Activity:

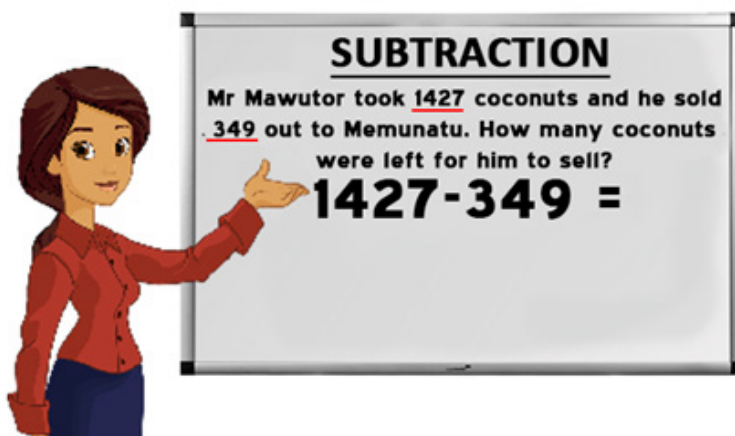
- (a) Revise with learners how to re-write four digits numbers in their expanded form using the place value chart.

For example: $4521 = 4000 + 500 + 20 + 1$ etc.



Learners Activity:

- i. Learners look on as teacher writes a subtraction word problem involving one 4-digits number and one 3-digits number on the board. For example:



***“Mr Mawutor took 1427 coconuts and he sold 349 out to Memunatu.
How many coconuts were left for him to sell?”***

- ii. Learners write the values given in the problem under their corresponding place values (positions) in the place value frame.
- iii. Learners state the number of hundreds, tens and ones in each number and write it in the expanded form. Thus $1427 = 1000 + 400 + 20 + 7$ and $349 = 300 + 40 + 9$

- iv. Learners subtract the values with the same place values starting from the ones and write down the answer (decompose tens to ones or hundreds to tens where need arise). Thus $1427 = 1000 + 400 + 20 + 7$ and $349 = 300 + 40 + 9$.
- v. Learners identify that since $7 - 9$ is not possible, learners regroup 1427 as $[1000 + 400 + 10 + (10 + 7)] = 400 + 10 + (17)$ Now $17 - 9 = 8^*$.
- vi. Learners now have $1000 + 400 + 10 + 8$
- vii. Next learners find $10 - 40$ which is also impossible hence we regroup one of the hundreds in the 400 to obtain 11 tens and 3 hundreds $[300 + (100 + 10) + 8]$ So $11 \text{ tens} - 4 \text{ tens} = 7 \text{ tens} = 70^*$. We now have $300 + 70 + 8$. Finally we find $300 - 300 = 0$ which is possible leaving us with 78 Hence $1427 - 349 = 1078$.
- viii. Learners solve $1427 - 349$ as $(1000 + 400 + 20 + 7) - (300 + 40 + 9)$
 $= (1000 + 400 + 10 + 17) - (300 + 40 + 9)$
 $= (1000 + 300 + 110 + 17) - (300 + 40 + 9)$
 $= (1000 + 300 - 300) + (70 + 40 - 40) + (8 + 9 - 9)$
 $= 1000 + 0 + 70 + 8$
 $= 1078$

Note for the teacher

- Let learners make two three-digit numbers by selecting digit randomly and placing them on the chart, talk about the place of each digit in the numbers created, use the place value tiles to model the number and then write the expanded form of the number created.
- Get learners to subtract the smaller numbers from the bigger using the expanded method to find the sum.

Reflection/Plenary:

1. Which numbers were easier or more difficult for you to subtract?
2. Which numbers did you ever had to add together in your mind?
3. What will you do to add two numbers correctly?
4. How could mental math help you outside of school?
5. How did you use the decomposition strategy to perform the subtraction?
6. What challenges did you face using this strategy?
7. How did you overcome the challenges?
8. Share your strategies with friends using the method of decomposition to subtract numbers.
9. Mention two (2) everyday life situations where we you use subtraction.

ACTIVITY 14A

Multiply two 1-digit numbers Using Group Formation

Material required:

Straws or Counting sticks in tens and units.



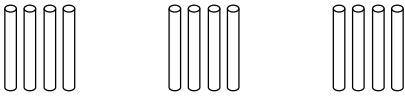
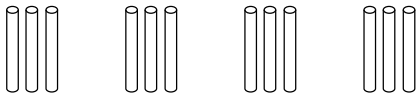
Teacher led Activity:

- (a) Put Learners into convenient groups of 3-4 members.
- (b) Give 12 straws to each group.
- (c) Have learners form equal groups with straws.
- (d) Ask how many groups were made?

For example:

4 groups of 3 straws
6 groups of 2 straws
1 group of 12 straws

3 groups of 4 straws
2 groups of 6 straws
12 groups of 1 straw

	3 groups of 4 = 3×4
	4 groups of 3 = 4×3
	2 groups of 6 = 2×6



Learners Activity:

- i. Learners form equal groups with the 12 straws as in the table above.
- ii. Learner mention the number of groups that can be form with the 12 straws/sticks.

- iii. Have learners demonstrate that 3 groups of 4 = 3×4 etc. as in the above examples.

Note for the teacher

- Explain that when a number is added to itself a certain number of times, that relation is denoted by the multiplication ($\times$) sign
- Give out more straws to Learners and have them form equal groups
- Go round and assist groups
- Invite Learners to demonstrate the formation of equal groups to the class.

Reflection/Plenary:

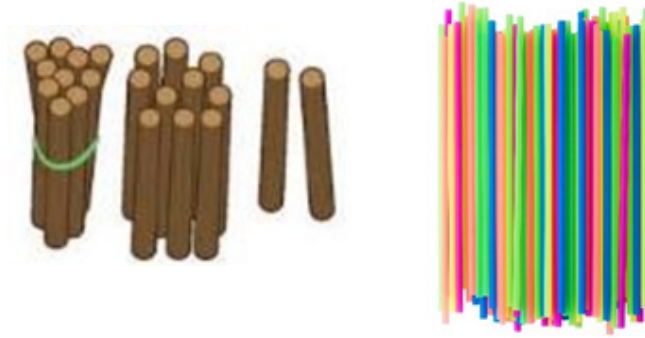
1. How many groups were you able to form with the 12 straws/sticks?
2. What does 4 group of 3, or 3 groups of 4 means?
3. What did you observe using group formation multiplication task?

ACTIVITY 15A

Multiplication of two 1-digit numbers

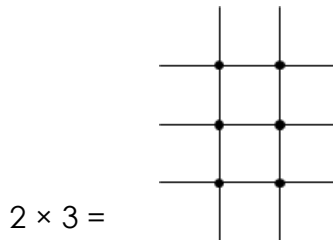
Material required:

Straws or sticks.



Teacher led Activity:

- (e) Write a multiplication sentence on the board. For example, find $2 \times 3 = ?$
- (f) Assist Learners to describe 2 times 3 as 2 legs of the Ladder and 3 arms of the ladder
- (g) Have Learners arrange 2 straws vertically (legs) and intersect it with 3 horizontal ones (arms)
- (h) Let Learners count the number of intersections



Learners Activity:

- i. Learners model different multiplication sentences. For example, 3×4 .
- ii. Learners to model the ladder from mentioned number of dots (intersections) by the teacher.
- iii. Learners draw vertical lines to represent the legs and horizontal lines across them to represent the arms and then count the number of intersections as the product.

Note for the teacher

- Put Learners into small groups.
- Get Learners to do further practice using the above strategy in groups.
- Go round and assist.
- Invite Learners to demonstrate the use the number line to the class.

Reflection/Plenary:

1. How many groups were you able to form with the 12 straws/sticks?
2. What does 4 group of 3, or 3 groups of 4 means?
3. What did you observe using group formation multiplication task?

ACTIVITY 16A

Multiplication of two 1-digit numbers

Material required:

Multiplication chart (up to 50 times 50 table).

x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
3	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
4	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
6	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
7	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140
8	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160
9	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144	153	162	171	180
10	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
11	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176	187	198	209	220
12	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
13	13	26	39	52	65	78	91	104	117	130	143	156	169	182	195	208	221	234	247	260
14	14	28	42	56	70	84	98	112	126	140	154	168	182	196	210	224	238	252	266	280
15	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300
16	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304	320
17	17	34	51	68	85	102	119	136	153	170	187	204	221	238	255	272	289	306	323	340
18	18	36	54	72	90	108	126	144	162	180	198	216	234	252	270	288	306	324	342	360
19	19	38	57	76	95	114	133	152	171	190	209	228	247	266	285	304	323	342	361	380
20	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400

Teacher led Activity:

- Display the multiplication chart
- Read the table by placing a finger or pointer on any one table and read it loudly and clearly, using column against row or vice versa.
E.g. 1×2 is 2; 2×2 is 4; 3×2 is 6; 5×7 is 35, etc.
- Invite 2-3 Learners and give each one of them a chance to read.

Learners Activity:

- Learners sit into smaller groups.
- Learners practise reading of the multiplication chart.
- Learners realise that the intersection of the row against column is the answer to a given multiplication task
- Learners work in groups to identify and discuss patterns in multiplication table (example doubles, squares, skip counts and factors)



x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
3	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
4	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
6	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
7	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140
8	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160
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14	14	28	42	56	70	84	98	112	126	140	154	168	182	196	210	224	238	252	266	280
15	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300
16	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304	320
17	17	34	51	68	85	102	119	136	153	170	187	204	221	238	255	272	289	306	323	340
18	18	36	54	72	90	108	126	144	162	180	198	216	234	252	270	288	306	324	342	360
19	19	38	57	76	95	114	133	152	171	190	209	228	247	266	285	304	323	342	361	380
20	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400

Figure 8: multiplication chart

LEVEL 1: READ UP TO 12 TIMES 12 TABLES

LEVEL 2: READ UP TO 20 TIMES 20 TABLES

Note for the teacher

- Explain to learners how to find answer to a multiplication expression on the multiplication chart.
- Ensure that learners read the chart as column against row or vice versa.
- Explain to the learners the various patterns that can be identified on the chart.

Reflection/Plenary:

1. How does using the Multiplication number chart helps you to do the multiplication?
2. What are some of the patterns that can be identified from the chart?
3. Share with the class everyday life situation where multiplication is used?
4. What would you do to ensure you improve on your strategy for doing multiplication?

ACTIVITY 16B

Multiplication of a 2-digit number by a 1-digit number

Material required:

Multiplication chart (up to 50 times 50 table).

x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
3	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
4	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
6	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
7	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140
8	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160
9	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144	153	162	171	180
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20	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400

Teacher led Activity:

- Display the multiplication chart
- Read the table by placing a finger or pointer on any one table and read it loudly and clearly, using column against row or vice versa.
E.g. 1×2 is 2; 2×2 is 4; 3×2 is 6; 5×7 is 35, etc.
- Invite 2-3 Learners and give each one of them a chance to read.

Learners Activity:

- Learners sit into smaller groups.
- Learners practise reading of the multiplication chart.
- Learners realise that the intersection of the row against column is the answer to a given multiplication task
- Learners work in groups to identify and discuss patterns in multiplication table (example doubles, squares, skip counts and factors)



x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
3	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
4	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
6	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
7	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140
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11	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176	187	198	209	220
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14	14	28	42	56	70	84	98	112	126	140	154	168	182	196	210	224	238	252	266	280
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16	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304	320
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19	19	38	57	76	95	114	133	152	171	190	209	228	247	266	285	304	323	342	361	380
20	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400

Figure 8: multiplication chart

LEVEL 1: READ UP TO 12 TIMES 12 TABLES

LEVEL 2: READ UP TO 20 TIMES 20 TABLES

Note for the teacher

- Explain to learners how to find answer to a multiplication expression on the multiplication chart.
- Ensure that learners read the chart as column against row or vice versa.
- Explain to the learners the various patterns that can be identified on the chart.

Reflection/Plenary:

1. How does using the Multiplication number chart helps you to do the multiplication?
2. What are some of the patterns that can be identified from the chart?
3. Share with the class everyday life situation where multiplication is used?
4. What would you do to ensure you improve on your strategy for doing multiplication?

ACTIVITY 16C

Multiplication of Whole numbers (2- digit by 2-digit number)

Material required:

Multiplication chart (up to 50 times 50 table).

x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
3	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
4	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
6	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
7	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140
8	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160
9	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144	153	162	171	180
10	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
11	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176	187	198	209	220
12	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
13	13	26	39	52	65	78	91	104	117	130	143	156	169	182	195	208	221	234	247	260
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16	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304	320
17	17	34	51	68	85	102	119	136	153	170	187	204	221	238	255	272	289	306	323	340
18	18	36	54	72	90	108	126	144	162	180	198	216	234	252	270	288	306	324	342	360
19	19	38	57	76	95	114	133	152	171	190	209	228	247	266	285	304	323	342	361	380
20	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400

Teacher led Activity:

- Draw or display the multiplication chart
- Lead learners to make a copy of the multiplication chart in their note books.
- Display the multiplication chart.
- Read the table by placing a finger or pointer on any one number and read it loudly and clearly. E.g. 1×2 is 2; 2×2 is 4; 3×2 is 6; etc.
- Invite 2-3 Learners and give each one of them a chance to read.
- Put learners into smaller groups.
- Give out a multiplication chart to each group to practise reading.
- Have Learners work in groups to identify and discuss patterns in multiplication table (example doubles, squares, skip counts and factors)



Learners Activity:

- Put learners into smaller groups (2 to 3) learners.
- Give each group different question to solve using the multiplication chart.
- Let each group present their answer.

x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
3	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
4	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
6	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
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19	19	38	57	76	95	114	133	152	171	190	209	228	247	266	285	304	323	342	361	380
20	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400

Figure 8: multiplication chart

Note for the teacher

- Put learners into small groups
- Give tasks for learners to practice in groups using the multiplication chart.
- Go around to assist learners
- Ask learners to present their work to their colleagues.

Reflection/Plenary:

1. What challenges did you face using this method?
2. Give a real-life situation that involve multiplication.
3. How did you find your answer?

ACTIVITY 17B1

Multiplication of Whole Numbers

Using the “Expand and Box” Method
(Partial decomposition method)

Material required:

Chalk board, Classroom floor, Manila card.



Teacher led Activity:

(a) Write a multiplication problem.

For example: Solve For example $17 \times 6 = ?$

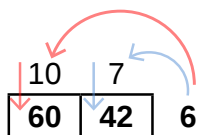
(b) Lead Learners to identify the place value of each digit in the given numbers

(c) Let Learners write the given numbers in the expanded form
($17 = 10$ and 7 ; 6)

(d) Assist Learners to place the expanded numerals in the rectangular or square grid (box) as shown (10 and 7 at the top; and 6 by the side of the 2 by 1 rectangular grid).

(e) Lead Learners to multiply through the expanded numerals and write down their products.

(f) Guide Learners to then add the resultant products as shown.



$$\begin{aligned} \text{i.e. } 17 \times 6 &= (10 + 7) \times 6 = (10 \times 6) + (7 \times 6) \\ &= (60 + 42) \\ &= 60 + (40 + 2) \end{aligned}$$

$$\begin{aligned} &= 60 + 40 + 2 \\ &= 100 + 2 \\ &= 102 \end{aligned}$$

Note for the teacher

- Put Learners into small groups.
- Give more tasks for Learners to practice using the above strategy in their groups.
- Go round and assist groups.
- Invite Learners to demonstrate how they solved the problem to the class..

Reflection/Plenary:

1. How does using the Expand and Box method helps you to do the multiplication?
2. What is difficult about using this method?
3. What is very interesting about the method?
4. What would you do to ensure you improve on the strategy for doing Multiplication?

ACTIVITY 17B2

Multiplication of 2-digits by 2-digits Whole Numbers

Using the “Expand and Box” Method
(Partial decomposition method)

Material required:

Writing board, Classroom floor, Manila card.



Teacher led Activity:

(a) Write a multiplication problem.

For example: Find the product of $48 \times 26 = ?$



Learners Activity:

- Learners identify the place value of each digit in the given numbers
- Learners write the given numbers in the expanded form ($48 = 40$ and 8 ; $26 = 20$ and 6)
- Learners place the expanded numerals on the box as shown (40 and 8 at the top; 20 and 6 by the side of the 2 by 2 box)
- Learners multiply through the expanded numerals and write their products
- Learners then add the resultant product as shown

The Box Method

	40	8	
20	$20 \times 40 = 800$	$20 \times 8 = 160$	800
6	$6 \times 40 = 240$	$6 \times 8 = 48$	240
			160
			+ 48
			1,248

$$48 \times 26 = 1,248$$

Note for the teacher

- Put Learners into small groups.
- Give more tasks for Learners to practice using the above strategy in their groups.
- Go round and assist groups.
- Invite Learners to demonstrate how they solved the problem to the class.

Reflection/Plenary:

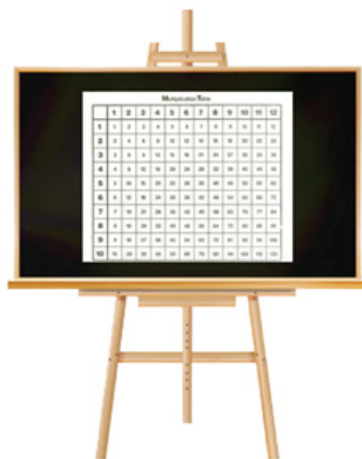
1. How does using the Expand and Box method helps you to do the multiplication?
2. What is difficult about using this method?
3. What is very interesting about the method?
4. What would you do to ensure you improve on the strategy for doing Multiplication?

ACTIVITY 17D

Multiplication of 3 digit numbers by a 1-digit number n - box method

Material required:

Chalk board illustration, multiplication chart.



Teacher led Activity:

- Revise with learners on the place value of digits in numbers by writing given numbers in expanded form.
- Write a multiplication problem. For example, solve $48 \times 26 = ?$
- Assist Learners to identify the place value of each digit in the given numbers.
- Let Learners write the given numbers in the expanded form ($48 = 40$ and 8 ; $26 = 20$ and 6). Place the expanded numerals on the box as shown (40 and 8 at the top; 20 and 6 by the side of the 2 by 2 box). Then multiply through the expanded numerals and write their products.
- Learners then add the resultant product as shown

The Box Method

	40	8	
20	$20 \times 40 = 800$	$20 \times 8 = 160$	800
6	$6 \times 40 = 240$	$6 \times 8 = 48$	240
			160
			+ 48
			1,248
		$48 \times 26 = 1,248$	



Learners Activity:

- i. Write a multiplication problem. For example, solve
- ii. Learners (individual/groups) identify the place value of each digit in the given numbers.
- iii. Learners write the given numbers in the expanded form
- iv. Learners use the box set up and strategy (are model) to solve

Note for the teacher

- Put learners into convenient groups.
- Have learners do further practice using the expand and box strategy and ensure that they explain their reasoning
- Go around and assist.
- Invite learners to demonstrate how to use their strategies to solve the problem.
- Have learners multiply a three-digit by 1-digit number
- Have learners subtract the smaller numbers from the bigger using the expanded method to find the sum

Reflection/Plenary:

1. Were some problems easier or more difficult for you to solve?
Which ones?
2. Have you ever had to add numbers together in your mind,
outside of school?
3. Next time you must add two numbers correctly, what will you do to
add correctly?
4. How could mental math help you outside of school?
5. How did you use the decomposition strategy to perform
the subtraction?
6. What challenges did you face using this strategy?
7. How did you overcome the challenges?
8. Share your strategies with friends using the decomposition to
subtract numbers.
9. Mention everyday life situations where we use subtraction.

ACTIVITY 17E

Multiplication using decomposition/expansion

Material required:

Chalkboard illustration and learners exercise books.



Teacher led Activity:

- (a) Display partition multiplication frame in a way that it is visible to all learners.
- (a) Assist learners draw the partition frame at the back of their exercise book to be used in their groups.
- (a) Pay attention to individual learners having learning disabilities.
- (a) For example:
- (a) To find the product of 235×12 , we write 235 as $200+30+5$ and 12 as $10+2$. We then use the approach shown below to find the product

Partition Frame

X	200	30	5	Product
10	2000	300	50	2350
2	400	60	10	470
Total				2820



Learners Activity:

- Write a multiplication problem on the board for learners.
For example, solve $815 \times 34 = ?$
- Have Learners identify the place value of each digit in the given numbers
- Learners write the given numbers in the expanded form ($815 = 800, 10$ and 5 ; $34 = 30$ and 4)
- Learners place the expanded numerals on the box as shown ($800, 10$ and 5 at the top; 30 and 4 by the side of the 3 by 2 box)
- Learners multiply through the expanded numerals and write their products
- Learners then add the resultant product as shown

815 x 34

we partition 815 into 800 and 10 and 5 and put it in a table
we partition 34 into 30 and 4 and put it in table

x	800	10	5
30	24000	300	150
4	3200	40	20

Multiply the numbers in the grid one by one,
then add all the numbers to make 27,710.

Note for the teacher

- Put Learners into small groups.
- Give more tasks for Learners to practice using the above strategy in their groups.
- Go round and assist groups.
- Invite Learners to demonstrate how they solved the problem to the class.

Reflection/Plenary:

- What role did you play when working as a team?
- How does working in groups help?
- If you are to multiply 345 by 35 using the method you used in your group, how will go about it?

ACTIVITY 18B

Multiplication of Whole Numbers Using the lattice Method

Material required:

Chalk board or manila card or classroom floor.



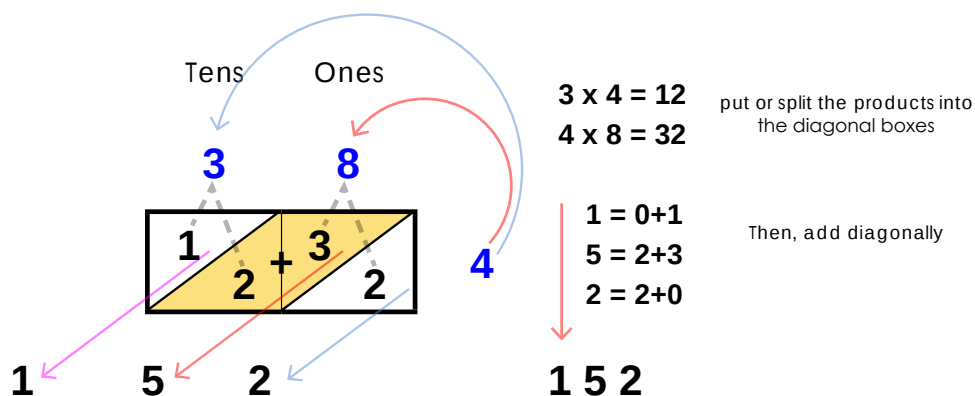
Teacher led Activity:

- Write a multiplication problem. For example, Solve $38 \times 4 = ?$
- Get Learners to draw a 2 by 1 rectangular box.
- Guide Learners to draw a diagonal for each of the two small boxes. (Within each small box the left upper part of the diagonal takes the value of Tens and the lower part takes the value of Ones).
- Lead Learners to write the first number (38) on the box and the second number (4) by the side of the box as shown.
- Get Learners to multiply 3 and 8 by 4 and put the products (12 and 32) in the spaces as shown row as shown.
- Starting from the right, assist Learners to add the numbers in the boxes diagonally.
- Have Learners write the final answer as 152.



Learners Activity:

- Learners draw the 2 by 1 Lattice Box for multiplication expression, $38 \times 4 = ?$
- Learners perform the multiplication and fix in the values the box
- Learners add the numbers in the box diagonally starting from the right-hand side
- Learners write the final answers 152 in their jotters.



Therefore $38 \times 4 = 152$



Note for the teacher

- Put Learners into small groups.
- Give more tasks for Learners to practice using the above strategy in their groups.
- Go round and assist groups
- Invite Learners to demonstrate how they solved the problem to the class.

Reflection/Plenary:

1. How does using the Lattice method helps you to do the multiplication?
2. What is difficult about using this method?
3. What is very interesting about the method?
4. What would you do to ensure you improve on the strategy for doing multiplication?

ACTIVITY 18C

Multiply a 3-digit number by a 1-digit number using the lattice method

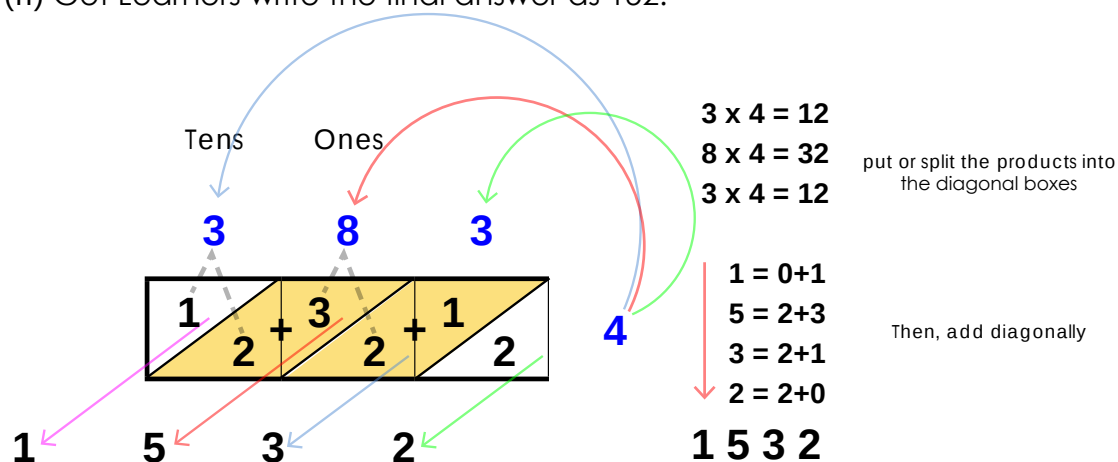
Material required:

Chalk board, Manila cards and classroom floor.



Teacher led Activity:

- Write a multiplication problem. For example, solve $383 \times 4 = ?$
- Have Learners draw a 1 by 3 rectangular box.
- Have Learners draw a diagonal for each of the three small boxes (columns).
- Within each small box the left upper part of the diagonal takes the value of Tens and the lower part takes the value of Ones.
- Have Learners write the first number (383) on the box and the second number (4) by the side of the box as shown.
- Get Learners to multiply 383 by 4 and put the products (12, 32 and 12) in the spaces as shown.
- Starting from the right, have Learners add the numbers in the boxes diagonally.
- Get Learners write the final answer as 152.



(i) Therefore $383 \times 4 = 1532$

**Learners Activity:**

- i. Learners sample question and ask them to solve using the lattice method
- ii. Learners into groups and give each group a different question.
- iii. Groups present their answers.

Note for the teacher

- Put Learners into small groups.
- Give more tasks for Learners to practice using the above strategy in their groups.
- Go round and assist groups.
- Invite Learners to demonstrate how they solved the problem to the class.

Reflection/Plenary:

1. What challenges did you encounter when using this method?
2. Give example of real-life situation where multiplication is used

ACTIVITY 18D1

Multiplication of 3 digit numbers by a 1-digit number - Lattice method

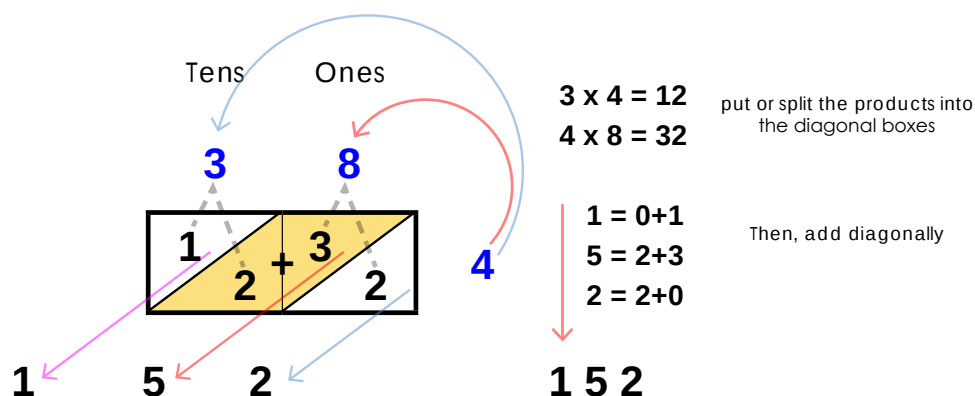
Material required:

Chalk board or manila card or classroom floor, multiplication chart.



Teacher led Activity:

- Write a multiplication problem. For example, solve $38 \times 4 = ?$
- Draw a 2 by 1 rectangular box, then draw a diagonal for each of the two small boxes (Within each small box the left upper part of the diagonal takes the value of Tens and the lower part takes the value of Ones). Write the first number (38) on the box and the second number (4) by the side of the box as shown multiply 3 and 8 by 4 and put the products (12 and 32) in the spaces as shown row as shown
- Starting from the right, have Learners add the numbers in the boxes diagonally.
- Have Learners write the final answer as 152.

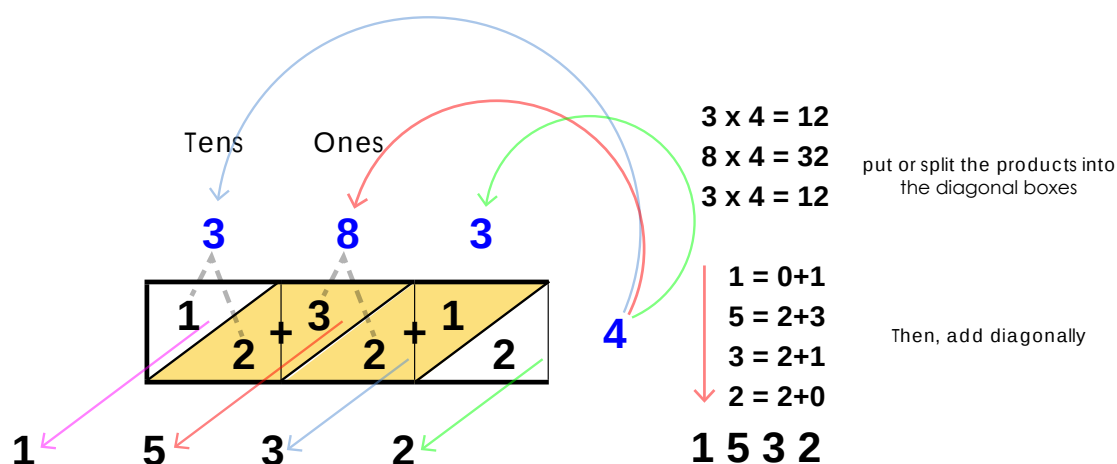


Therefore $38 \times 4 = 152$



Learners Activity:

- Write a multiplication problem. For example, solve $383 \times 4 = ?$
- Have Learners draw a 1 by 3 rectangular box
- Learners draw a diagonal for each of the three small boxes(columns)
- (Within each small box the left upper part of the diagonal takes the value of Tens and the lower part takes the value of Ones)
- Learners write the first number (383) on the box and the second number (4) by the side of the box as shown
- Get Learners to multiply 383 by 4 and put the products (12, 32 and 12) in the spaces as shown
- Starting from the right, Learners add the numbers in the boxes diagonally
- Learners write the final answer as 1532



Therefore $383 \times 4 = 1532$

Note for the teacher

- Learners into small groups.
- Give more tasks for Learners to practice using the above strategy in their groups.
- Go around and assist groups.
- Invite Learners to demonstrate how they solved the problem to the class.

Reflection/Plenary:

- Were some problems easier/more difficult for you to solve? Which ones?
- Have you ever had to multiply numbers together in your mind, outside of school?

3. Next time you must add two numbers correctly, what will you do to add correctly?
4. How could mental math help you outside of school?
5. How did you use the decomposition strategy to perform the multiplication?
6. What challenges did you face using this strategy?
7. How did you overcome the challenges?
8. Share your strategies with friends using the lattice method to multiply numbers
9. Mention everyday life situations where we use multiplication.

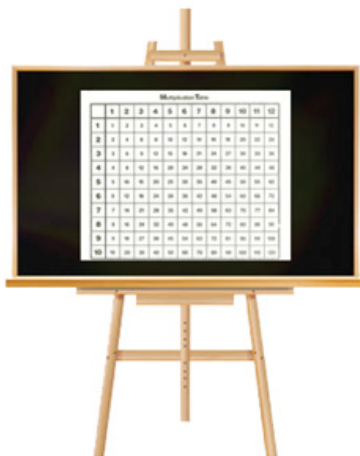
ACTIVITY 18D2

Modelling multiplication word problem

Involving a 3-digit number and 1-digit number

Material required:

Chalk board illustration, multiplication chart.



Teacher led Activity:

- (a) Revise learner's knowledge on multiplication using the multiplication charts, and other strategies including lattice and partial decomposition methods.



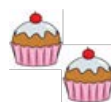
Learners Activity:

- i. Learners create story problems such as the ones below and discuss the problems and solve using any strategies of their choice.

A pack of pens contains 6 pens.
How many pens are in 5 packs?



Mrs. Adu brought 4 boxes of equal cupcakes to class. There are 16 cupcakes altogether.
How many cupcakes were in each box?



A paperclip is made of 10cm of wire.
How much wire would I need for 6 paperclips?



There are 50 toes in the pool.
Each person has 10 toes. How
many people are in the pool?



Mansa brought 40 mangoes to
share among her 5 friends. How
many mangoes will each friend
receive?



Note for the teacher

- Put learners into convenient groups.
- Have learners do further practice using the any strategy of their choice and ensure that they explain their reasoning
- Go around and assist.
- Invite learners to demonstrate how to use their strategies to solve the problem.
- Have learners create story problems for their colleagues to solve and vice versa using the give one, get one strategy.

Reflection/Plenary:

1. Were some problems easier/more difficult for you to solve? Which ones?
2. Have you ever had to multiply numbers together in your mind, outside of school?
3. Next time you must multiply two numbers correctly, what will you do to have your answer right?
4. Which strategy did you use, how did you use your strategy help you?
5. What challenges did you face using this strategy?
6. How did you overcome the challenges?
7. Share your strategies with friends.
8. Mention everyday life situations where we use multiplication.

ACTIVITY 18E

Multiplication using Lattice Method

Material required:

A4 sheets and learners exercise books and samples of lattice.



Teacher led Activity:

- Draw a 3 by 2 rectangular box and divide the boxes diagonally as shown below:
- Ask learners to draw the same in their note or exercise box. Make sure every learner does that.
- Write the multiplier on top of the 3 by 2 and the multiplicand.



Learners Activity:

- Learners look on as teacher writes a multiplication problem.
For example, solve $119 \times 23 = ?$
- Learners draw a 3 by 2 rectangular box and divide it into five parts
- Learners draw a diagonal for each small box (Within each small box the left upper part of the diagonal takes the value of Tens and the lower part takes the value of Ones)
- Learners write the first number (119) on the box and the second number (23) by the side of the box as shown
- Learners identify that in each box the diagonal division creates tens and ones.
- Learners to multiply 119 by 2 and put the products at the appropriate place in the each considering tens and ones first row as shown.

- vii. Get Learners to multiply 119 by 3 and put the products in the second row considering the tens and ones as shown in figure 18E.
- viii. Starting from the right, have Learners add the numbers in the boxes diagonally. Therefore $119 \times 23 = 2737$.

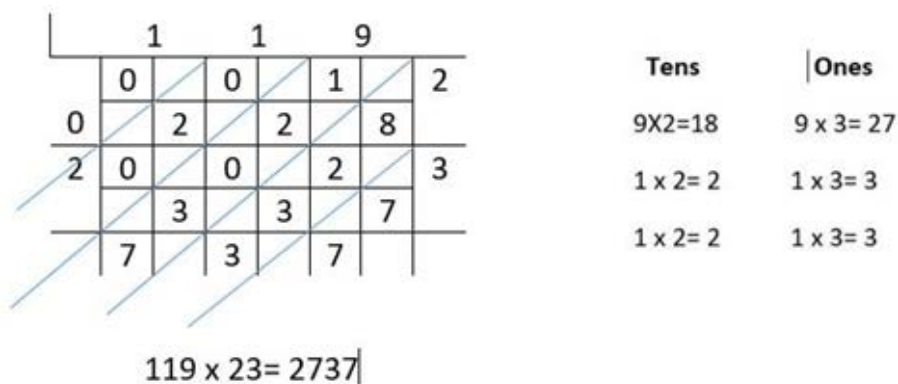


Figure 18E: Lattice method

Note for the teacher

- Put Learners into small groups.
- Give more tasks for Learners to practice using the above strategy in their groups.
- Go round and assist groups.
- Invite Learners to demonstrate how they solved the problem to the class.

Reflection/Plenary:

1. Tell the class what you have learned today.
2. How can you use the lattice method to solve the following multiplication problem 926×46 ?

ACTIVITY 19A

Division of 2-digit numbers by a 1-digit number

Material required:

Straws or stick.



Note: Explain division as a concept of forming equal sub-groups of a quantity of object(s) and determining how many equal sub-groups have been formed.



Teacher led Activity:

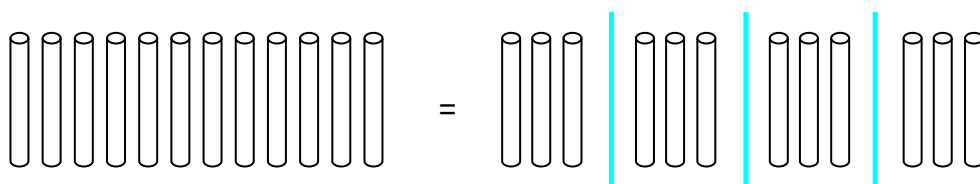
- Put Learners into convenient groups of 4-5.
- Give 12 straws to each group.
- Explain that when quantities are put into equal sub-groups of a certain number of times, that relation is denoted by the division ($\div$) sign

Learners Activity:

Learners put the straws into equal groups of:

- Three and find how many groups they obtain?
- Four and find how many groups they obtain?
- Six and find how many they obtain?
- Two and find how many they obtain?

For example, when 12 straws are put into equal groups of 3, we have $12 \div 3 = 4$



Similarly, when 12 straws are put into equal groups of 4, we have $12 \div 4 = 3$

Also, when 12 straws are put into equal groups of 6, we have $12 \div 6 = 2$

And when 12 straws are put into equal groups of 2, we have $12 \div 2 = 6$

Note for the teacher

- Give more tasks for Learners to practice with numbers involving a 2-digits by 1-digit number
- Visit the groups to assist
- Invite Learners to demonstrate division as grouping to the class.

Reflection/Plenary:

1. How does using division by grouping helps you to easily do division?
2. What is difficult about using this method?
3. What is very interesting about the method?
4. What would you do to ensure you improve on the strategy for doing division?

ACTIVITY 19B

Divide a 2-digit number by a 1-digit number

Material required:

Straws or counting sticks.



Teacher led Activity:

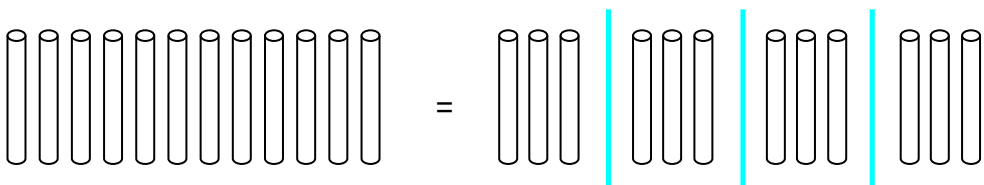
- Explain division as a concept of forming equal sub-groups of a quantity of object(s) and determining how many equal sub-groups have been formed.
- Explain that when quantities are put into equal sub-groups of a certain number of times, the operation is division and the symbol for division is ($\div$) sign.



Learners Activity:

- Learners sit into convenient groups of 4 – 5.
- Each group works with 12 straws.
- Learners put the straws into equal groups of:
 - Three and find how many groups they obtain.
 - Four and find how many groups they obtain.
 - Six and find how many they obtain
 - Two and find how many they obtain?

For example, when 12 straws are put into equal groups of 3, we have $12 \div 3 = 4$



Similarly, when 12 straws are put into equal groups of 4, we have $12 \div 4 = 3$
Also, when 12 straws are put into equal groups of 6, we have $12 \div 6 = 2$
And when 12 straws are put into equal groups of 2, we have $12 \div 2 = 6$

Note for the teacher

- Give more tasks for Learners to practice with numbers involving a 2-digits by 1-digit number
- Visit the groups to assist
- Invite Learners to demonstrate division as grouping to the class.

Reflection/Plenary:

1. How using division does by grouping helps you to easily do division?
2. What is difficult about using this method?
3. What is very interesting about the method?
4. What would you do to ensure you improve on the strategy for doing division?

ACTIVITY 19C

Doing Division by Method of Grouping.

Division of 2-digit numbers by a 1-digit number.

Material required:

Straws or counting sticks, pebbles, small stones, bottle tops.

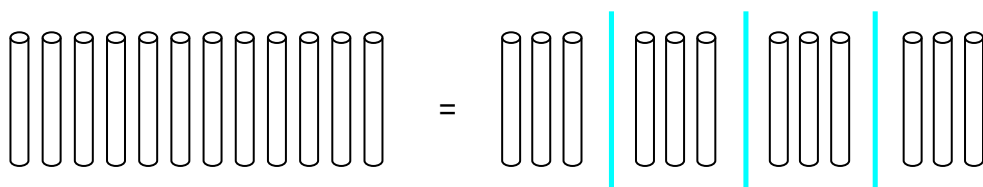


Teacher led Activity:

- Explain division as a concept of forming equal sub-groups of a quantity of object(s) and determining how many equal sub-groups have been formed.
- Put Learners into convenient groups of 4-5.
- Give 12 straws to each group.
- Ask the Learners to put the straws into equal groups of:
 - Three and find how many groups they obtain.
 - Four and find how many groups they obtain.
 - Six and find how many they obtain
 - Two and find how many they obtain?

Note: Explain that when quantities are put into equal sub-groups of a certain number of times, that relation is denoted by the division ($\div$) sign.

For example, when 12 straws are put into equal groups of 3, we have $12 \div 3 = 4$



Similarly, when 12 straws are put into equal groups of 4, we have $12 \div 4 = 3$
Also, when 12 straws are put into equal groups of 6, we have $12 \div 6 = 2$
And when 12 straws are put into equal groups of 2, we have $12 \div 2 = 6$

**Learners Activity:**

- i. Give similar questions to learners to use method of grouping to solve it.

Note for the teacher

- Give more tasks for Learners to practice with numbers involving a 2-digits by 1-digit number
- Visit the groups to assist
- Invite Learners to demonstrate division as grouping to the class.

Reflection/Plenary:

1. What challenges did you face using the strategy?
2. How did you know the number of groups?
3. Which material did you use?

ACTIVITY 20A

Division of 2-digit numbers by a 1-digit number.

Material required:

Straws or counting sticks.

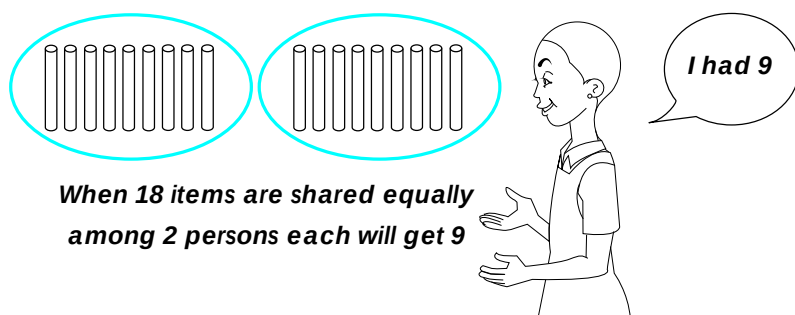
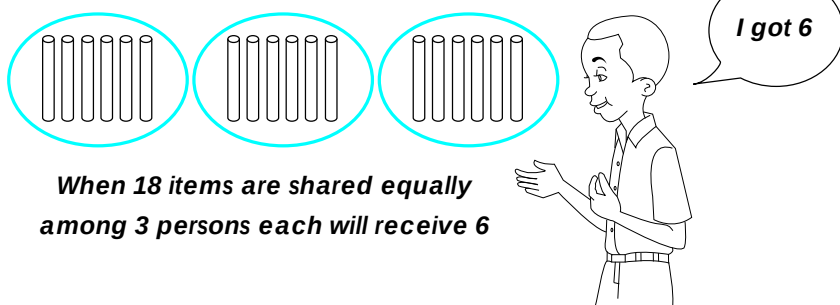


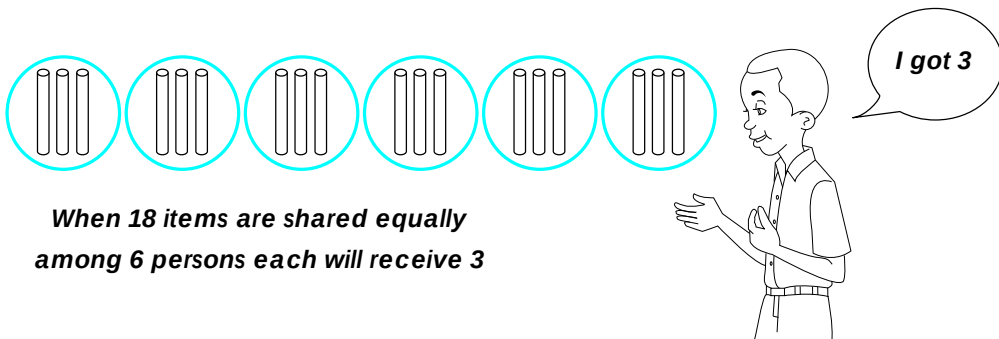
Note: Explain division as a concept of sharing or separating a quantity of objects into equal number of groups and determining how many are in each group.



Teacher led Activity:

- (a) Put the Learners into small groups.
- (b) Distribute 18 sticks to each group.
- (c) Instruct every group to distribute the sticks equally 2, 3, 4, 5, 6, 7, 8, and/ or 9, members.



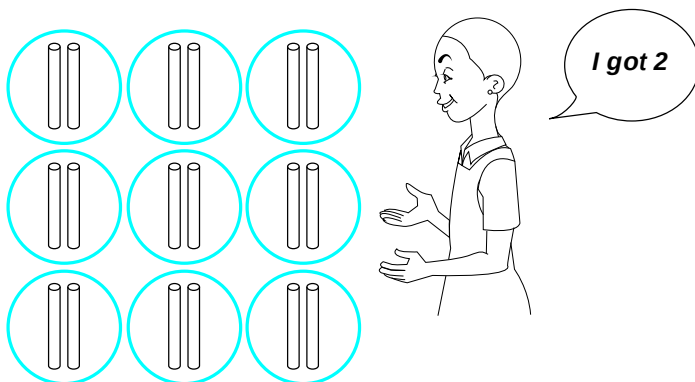


(d) Ask how many learners were given sticks and how many each of the sticks?

Note: Explain that the process of equal distribution of counting sticks is denoted by the division ($\div$) symbol.

For example, sharing 18 equally among 3, means 18 divided by 3, and is written as $18 \div 3 = 6$.

Similarly, dividing 18 equally among 9, each will have 2. Thus 18 divided by 9 is the same as $18 \div 9 = 2$.



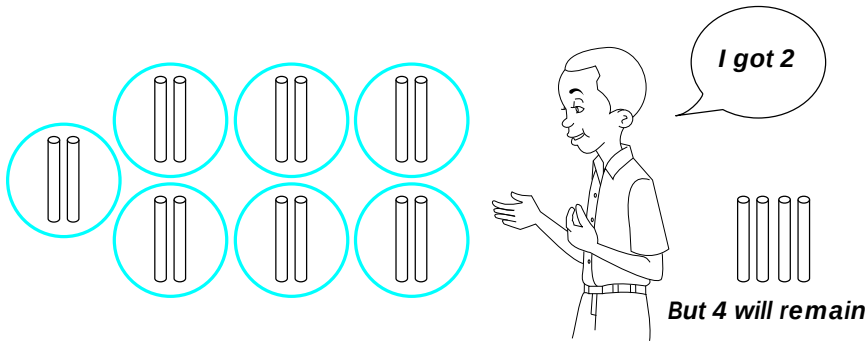
Also, dividing 18 equally among 6, is the same as $18 \div 6 = 3$

And dividing 18 equally among 2, is the same as $18 \div 2 = 9$

Note: Things to remember:

- i. Use examples that will also have a remainder.

For example, when 18 is divided by 7, everyone gets 2 and 4 will remain.



Thus 18 divided by 7 = $18 \div 7 = 2 \text{ r}4$

Note for the teacher

- Give more tasks for learners to practice with numbers involving a 2-digit numbers by a 1-digit number.
- Visit the groups to assist struggling members.
- Invite groups to demonstrate division as sharing to the class.
- Explain the concept using the common saying "one for you, one for me"

Reflection/Plenary:

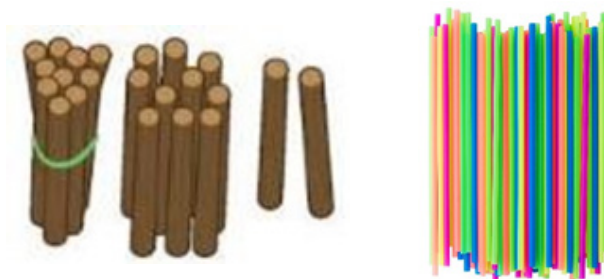
1. How using division does by sharing helps you to easily do division?
2. What is difficult about using this method?
3. What is very interesting about the method?
4. What would you do to ensure you improve on the strategy for doing division?

ACTIVITY 20B

Divide 2-digit numbers by a 1-digit number (Sharing)

Material required:

Straws or counting sticks.



Teacher led Activity:

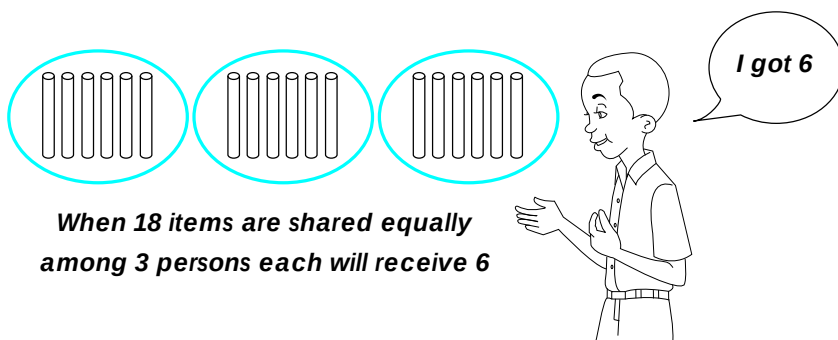
- (a) Explain division as a concept of sharing or separating a quantity of objects into equal number of groups and determining how many are in each group. Explain that the process of equal distribution of sticks is denoted by the division ($\div$) symbol.

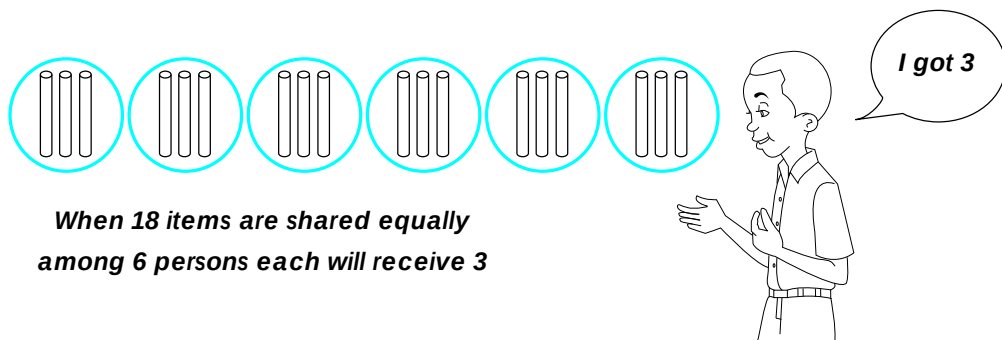
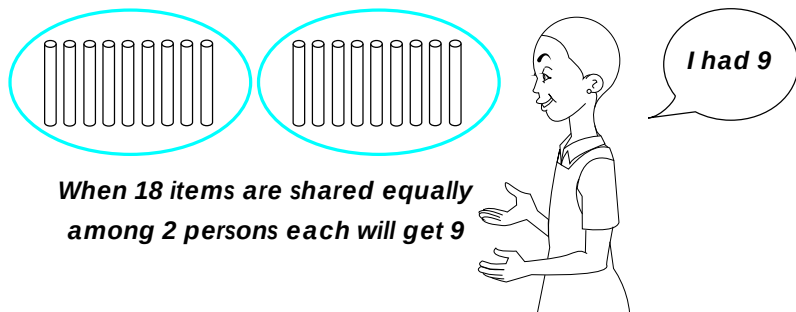
Note: Explain division as a concept of sharing or separating a quantity of objects into equal number of groups and determining how many are in each group.



Teacher led Activity:

- (a) Put the Learners into small groups.
(b) Distribute 18 sticks to each group.





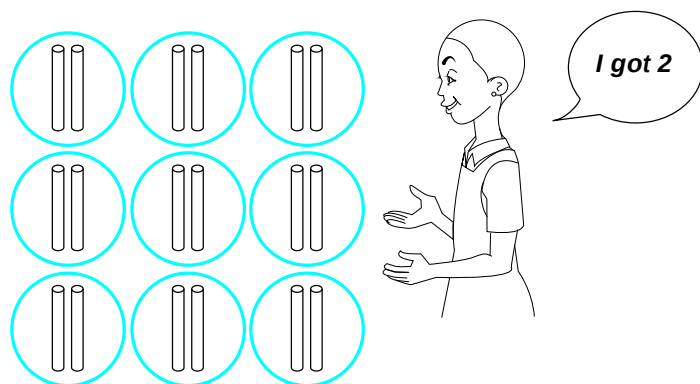
(c) Instruct every group to distribute the sticks equally 2, 3, 4, 5, 6, 7, 8, and/ or 9, members.

(d) Ask how many participants were given sticks and how many each?

For example 18 equally among 3, means 18 divided by 3 is the same as $18 \div 3 = 6$.

Similarly, dividing 18 equally among 9, each will have 2.

Thus 18 divided by 9 is the same as $18 \div 9 = 2$.



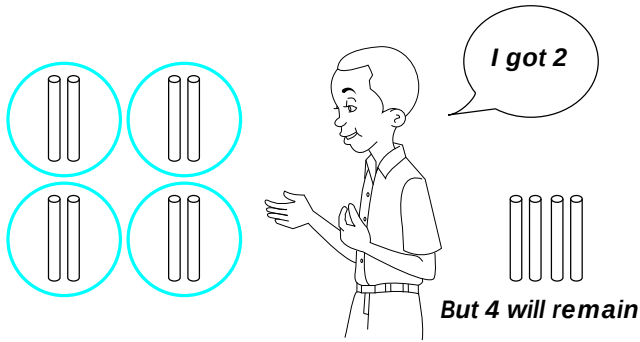
Also, dividing 18 equally among 6, is the same as $18 \div 6 = 3$

And dividing 18 equally among 2, is the same as $18 \div 2 = 9$

Note: Things to remember:

- i. Use examples that will also have a remainder.

For example, when 18 is divided by 7, everyone gets 2 and 4 will remain.



Thus 18 divided by 7 = $18 \div 7 = 2 \text{ r}4$

Note for the teacher

- Give more tasks for learners to practice with numbers involving a 2-digit numbers by a 1-digit number.
- Visit the groups to assist struggling members.
- Invite groups to demonstrate division as sharing to the class.
- Explain the concept using the common saying "one for you, one for me"

Reflection/Plenary:

1. How does sharing helps you to easily do division?
2. What is difficult about using this method?
3. What is very interesting about the method?
4. What would you do to ensure you improve on the strategy for doing division?

ACTIVITY 21B

Divide a 2-digit number by a 1-digit number (As inverse)

Material required:

Chalk board or classroom floor.



Teacher led Activity:

(a) Explain that division can be carried out as an inverse of multiplication by the following set up: For example, to solve $12 \div 3$.

(b) Write:

$$12 \div 3 = \boxed{\text{What?}} \quad \text{means} \quad 3 \times \boxed{\text{What?}} = 12$$

Learners Activity:

- Learners use the multiplication chart identify the number which multiplies 3 to obtain 12
- Learners choose the number as the answer to the problem
That is $12 \div 3 = 4$

Note for the teacher

- Put Learners into small groups.
- Give more tasks for Learners to practice with numbers involving division of 2-digits by a 1-digit number.
- Visit the groups to assist them.
- Invite Learners to demonstrate division as inverse of multiplication to the class.

Reflection/Plenary:

1. How does using division as inverse of multiplication helps you to easily do division?
2. What is difficult about using this method?
3. What is very interesting about the method?
4. What would you do to ensure you improve on the strategy for doing division?

ACTIVITY 21D

Division word problems (3-digit by 1-digit)

Material required:

Chalk board, counting objects (straws, bottle tops, counting sticks)



Teacher led Activity:

- Revise learner's knowledge for division strategies
- Write division word problems on the board. For example:
"Mansa brought 40 mangoes to share among her 5 friends. How many mangoes will each friend receive?"
- Lead learners to find out:
 - What has been given in the problem – number of mangoes to be shared = 40, persons to share the mangoes = 5
 - What is the key question in the problem – how much was left, the change he will get?
 - What to do to get the answer – share the mangoes equally among the 5 persons.
 - What mathematical operation is appropriate to use – (Division or multiplication)
 - Learners write the mathematical statement for the word problems: $40 \div 5 = ?$



Learners Activity:

- Learners into convenient groups
- Learners write a division problem. For example, to solve $276 \div 3 =$
- Learners use estimation, and other related strategies to solve the problem
- Learners share their results with the whole class



Note for the teacher

- Ensure learners work in groups and individually.
- Have learners do further practice using their strategies and ensure that they explain their reasoning
- Go around and assist.
- Invite learners to demonstrate how to use their strategies to solve the problem.
- Have learners create story problems for their colleagues to solve and vice versa using the give one get one strategies

Reflection/Plenary:

1. Were some problems easier/more difficult for you to solve? Which ones?
2. Have you ever had to divide numbers together in your mind, outside of school?
3. Next time you must division two numbers correctly, what will you do to have your answer right?
4. Which strategy did you use, how did you use your strategy help you?
5. What challenges did you face using this strategy?
6. How did you overcome the challenges?
7. Share your strategies with friends
8. Mention everyday life situations where we use division.

ACTIVITY 22B

Doing Division as Repeated Subtraction

Material required:

Chalk board or classroom floor.



Teacher led Activity:

- Explain division as repeated subtraction of a particular number from a given number until there is none left and then determining the number of times the number is subtracted from the quantity.
- Write a problem on the board. For example $12 \div 3 = ?$
- Ask the Learners "How many 3s are in 12?" or "How many lots of 3 can be obtained or subtracted from 12?"
- Write the division $25 \div 5 = ?$ on the blackboard.
- Put Learners into pairs and ask them to solve the task on the blackboard using repeated subtraction.
- Give Learners at least 5 minutes to find the answer to the question.



Learners Activity:

- Learners write the expressions, $12 \div 3 = ?$ and $25 \div 5 = ?$ in their jotters.
- Learners subtract 3 repeatedly from 12 and count the number of times they did i.e. $12 - 3 - 3 - 3 - 3 = 0$; 4 lots of 3 can be obtained or subtracted from 12.
- Learners solve similar example such as $25 \div 5 = ?$
- Learners in pairs share their answers with the class



Note for the teacher

- Learners repeatedly subtract the divisor (i.e. 5) from the given number (i.e. 25) until there is nothing left;

$$\begin{array}{r} 25 \\ - 5 \quad 1 \\ \hline 20 \\ - 5 \quad 1 \\ \hline 15 \\ - 5 \quad 1 \\ \hline 10 \\ - 5 \quad 1 \\ \hline 5 \\ - 5 \quad 1 \\ \hline 00 \quad 5 \end{array}$$

- Learners count the number of times 5 was subtracted from 25, which is 5 times. Hence, $25 \div 5 = 5$
- Give learners more division problems to solve using repeated subtraction. For example, “A Head teacher has 36 pieces of chalk to be shared among 8 teachers. How many pieces of chalk did each teacher get?”

Reflection/Plenary:

Teacher may ask the following:

1. What is your answer?
2. How did you find your answer?
3. Did anyone get a different answer?
4. How can this problem be solved differently?

ACTIVITY 22C

Doing Division as Repeated Subtraction

Material required:

Chalk board or classroom floor.



Teacher led Activity:

- Review previous lesson with learners.
- Explain that Repeated subtraction as a method of subtracting an equal number of items from a larger group.
- Write a division problem on the board. For example $125 \div 25 = ?$
- Ask Learners "how many 25s are in 125 or how many lots of 25 can be obtained or subtracted from 125?"
- Have Learners subtract 25 repeatedly from 125 and count the number of times they did i.e. $125 - 25 - 25 - 25 - 25 - 25 = 0$; 5 lots of 25 can be obtained or subtracted from 125



Learners Activity:

- Write the following division question of the board $135 \div 45$
- Ask learners to use the repeated subtraction method to solve it.
- Put learners into groups, give them sample questions and ask them to present their answers to other groups.



Note for the teacher

- Learners repeatedly subtract the divisor (i.e. 45) from the given number (i.e. 135) until there is nothing left.

$135 - 45 = 90$, first subtraction

$90 - 45 = 45$, second subtraction

$45 - 45 = 0$, third subtraction

- Learners count the number of times 45 was subtracted from 135, which is 3 times. Hence, $135 \div 45 = 3$
- Put learners in convenient groups.
- Give more tasks for Learners to practice
- Visit the groups to assist
- Invite Learners to demonstrate division as grouping to the class.

Reflection/Plenary:

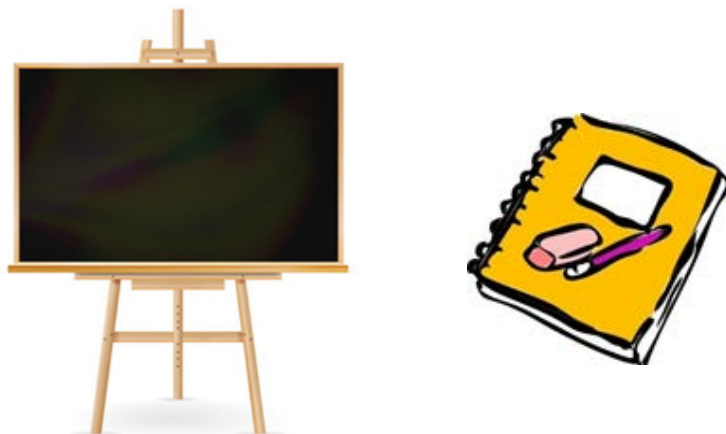
1. What is your answer?
2. How did you find your answer?
3. Did anyone get a different answer?
4. How can this problem be solved differently?
5. What challenges did you encounter?
6. How were you able to overcome the challenge?
7. Which other method can you use to solve this question? Is this method less challenging than that method?

ACTIVITY 22D

Division of whole numbers by repeated subtraction

Material required:

Chalk board or classroom floor, learner's jotter, place value tiles.



Teacher led Activity:

- Explain division as a way of repeatedly subtracting a number from a given quantity until there is none left and then determining the number of times the number is taken from the quantity
- For example, write a problem on the board. For example $126 \div 42 = ?$
- Ask the Learners "how many 42s are in 126 or how many lots of 42 can be obtained or subtracted from 126?"
- Have Learners subtract 3 repeatedly from 12 and count the number of times they did i.e. $126 - 42 = 84 - 42 = 42 - 42 = 0$; 3 lots of 42 can be obtained or subtracted from 126. Therefore $126 \div 42 = 3$
- Give learners at least 5 minutes to find the answer to the question
- Learners think-pair -share their solution process with the class
- Learners tell their answer and explain how found their answer?
- Learners explain how the problem can be solved differently?

Note for the teacher

- Put learners into convenient groups.
- Have learners do further practice using the strategy and ensure that they explain their reasoning
- Go around and assist.



- Invite learners to demonstrate how to use their strategies to solve the problem.
- Have learners create story problems for their colleagues to solve and vice versa using the “give one get one” strategy.

Reflection/Plenary:

1. Were some problems easier/more difficult for you to solve? Which ones?
2. Have you ever had to divide numbers together in your mind, outside of school?
3. Next time you must multiply two numbers correctly, what will you do to have your answer right?
4. Which strategy did you use, how did you use your strategy help you?
5. What challenges did you face using this strategy?
6. How did you overcome the challenges?
7. Share your strategies with friends.
8. Mention everyday life situations where we use division.

ACTIVITY 22E

Division as repeated subtraction

Material required:

Picture of scaffold, and Worksheets.



Teacher led Activity:

- Revise subtraction problems with learners.
- Write a subtraction problem on board.
- Ask learners to subtract same number from the given number until it cannot be possible.



Learners Activity:

- Learners explain division as a way of repeatedly subtracting a particular number from a given quantity until there is none left and then determining the number of times the number is taken from the quantity
- Learners look on as teacher writes a division sentence on the board. For example, $195 \div 13 = ?$
- Learners estimate “how many times 13 can be subtracted from 165 to get zero (0) without a remainder?” or how many lots of 13 can be obtained or subtracted from 195?”
- Learners subtract 13 repeatedly from 195 and count the number of times they did i.e. $195 - 13 - 13 - 13 - 13 - 13 \dots (15 \text{ times}) = 0$; 15 lots of 13 can be obtained or subtracted from 195
- Similarly, to solve $195 \div 13 = ?$

**Note for the teacher**

- Put Learners into small groups considering the individual learning needs.
- Give more tasks (on Worksheets) for Learners to practice using the above strategy in their groups.
- Go round and assist groups.
- Invite Learners to solve similar problems for the class to see.

Reflection/Plenary:

1. What role did you play when working as a team?
2. How does working in groups help?
3. If you are to divide 345 by 35 using the method you used in your group how will you start it?
4. Do you think there will be a remainder or not?
5. Solve this division problem $345 \div 35$ on the board using repeated subtraction approach.

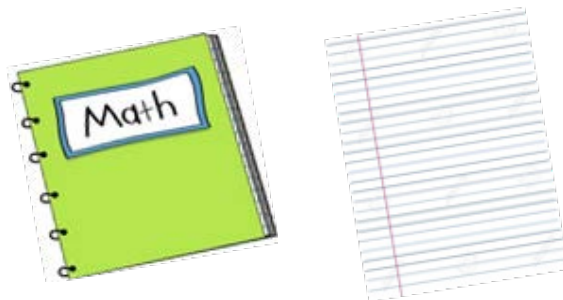
ACTIVITY 23C

Doing Division using the “Big 7” or Scaffolding Method.

Division of 3-digit numbers by a 1-digit number.

Material required:

Note book, Worksheets.



Notes to Facilitator:

This strategy is nicknamed the “Big 7” because the division box looks like a 7. Learners will have to use numbers that make sense to them throughout the process; therefore, although the answer to the problem will be the same, the number of steps taken to solve the problem will vary based on Learners estimation skills and number sense.

Teacher led Activity:

(a) Write a division question on the board e.g. $471 \div 3$

(b) Begin with an estimation.

- About how many groups of 3 can fit into 471? Ask learners to choose a number that is friendly and easy to think about. Numbers in 10s are usually a good estimate. In our example, a good estimate will be 100.

(c) Multiply 100 by $3=100 \times 3=300$. Subtract 300 from $471=471-300=171$. Write 100 at the right side of the “Big 7” symbol.

(d) Ask learners to estimate how many more groups of 3 can be taken out of 171. A friendlier estimate is 50. Multiply 50 by $3=50 \times 3=150$. Subtract 150 from $171=171-150=21$. Write 50 at the right side of the big 7 symbol.

$$\begin{array}{r}
 3 \overline{) 471} \\
 \underline{300} \\
 171 \\
 \underline{150} \\
 21 \\
 \underline{21} \\
 0
 \end{array}
 \begin{array}{r}
 100 \\
 50 \\
 7 \\
 \hline
 157
 \end{array}$$

- (e) Ask learners to find the groups of 3 in 21. The answer is 7 since $7 \times 3 = 21$
 $21 - 21 = 0$. Write 7 at the right side of the big 7 symbol.
- (f) Add all the numbers on the right side of the big 7 to obtain the answer.
 $471 \div 3 = 100 + 50 + 7 = 157$



Learners Activity:

- i. Write the following division question of the board $624 \div 4$
- ii. Ask learners to use the big 7 strategy to solve it.
- iii. Put learners into groups, give different worksheet questions on division sentences to each group to solve using the big 7 strategy.
- iv. Pair the groups and ask them to present their answers to each other.?

Note for the teacher

- Put learners in convenient groups.
- Give more tasks for Learners to practice
- Visit the groups to assist
- Invite Learners to demonstrate division as grouping to the class.

Reflection/Plenary:

Teacher may ask the following questions:

1. What is your answer?
2. How did you get your answer?
3. Did anyone get a different answer?
4. How can this problem be solved differently?
5. What challenges did you encounter when using the strategy?

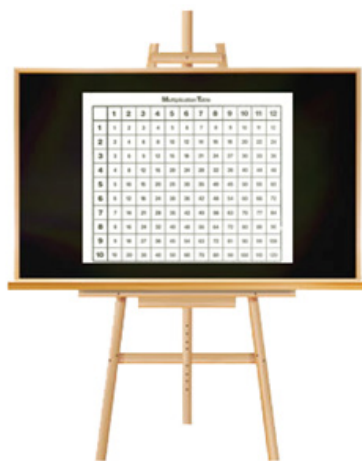
ACTIVITY 23D1

Division using the Scaffolding Method

Material required:

Worksheet with some number of “Big 7” sheets, multiplication chart.

$$\begin{array}{r}
 3 \overline{) 471} \\
 \underline{300} \quad 100 \\
 171 \\
 \underline{150} \quad 50 \\
 21 \\
 \underline{21} \quad 7 \\
 0 \quad \underline{\quad} \quad 157
 \end{array}$$



Teacher led Activity:

- Revise learner's knowledge on division strategies such as multiplication as inverse of division, grouping and sharing methods, repeated subtraction, scaffolding etc.,
- Introduce the “Big 7 strategy for division to learners
- In this strategy learners will have to use numbers that make sense to them throughout the process; therefore, although the answer to the problem will be the same, the number of steps taken to solve the problem will vary based on the learner's estimation skills and number sense.

Note: This strategy is nicknamed the “Big 7” because the division box looks like a 7.



Learners Activity:

- Learners represent a division sentence on the worksheet, on the “Big 7”.
For example: $276 \div 3 = \dots?$
- Learners estimate about how many groups of 3 can be obtained from 276.
- Learners may estimate of 40. So, $3 \times 40 = 120$.

- iv. Learners subtracting 120 from 276 to leave 156.
- v. Learners can use the next estimation as 50. Learners estimate about how many groups of 3 can go into 156. i.e. $3 \times 50 = 150$.
- vi. Subtracting 150 from 156 to get 6.
- vii. The next estimation used is 2. Learners estimate about how many groups of 3 can go into 156. i.e. $3 \times 2 = 6$
- viii. Subtracting 6 from 6 to get 0. There is nothing more to share.
- ix. To find the final answer add the estimations:

$$40 + 50 + 2 = 92.$$

Therefore $276 \div 3 = 92$.

3	276 - 120 156 - 150 6 - 6 0 40 50 2 92
	} +

Thus: $276 \div 3 = 92$



Note for the teacher

- Ensure learners work in groups and individual.
- Have learners do further practice using the strategy and ensure that they explain their reasoning
- Go around and assist.
- Invite learners to demonstrate how to use their strategies to solve the problem.
- Have learners create story problems for their colleagues to solve and vice versa using the “give one get one” strategy.

Reflection/Plenary:

1. Were some problems easier/more difficult for you to solve? Which ones?
2. Have you ever had to divide numbers together in your mind, outside of school?
3. Next time you must divide two numbers correctly, what will you do to have your answer right?

4. Which strategy did you use, how did you use your strategy help you?
5. What challenges did you face using this strategy?
6. How did you overcome the challenges?
7. Share your strategies with friends
8. Mention everyday life situations where we use division.

ACTIVITY 23D2

Division word problems (3-digit by 2-digits)

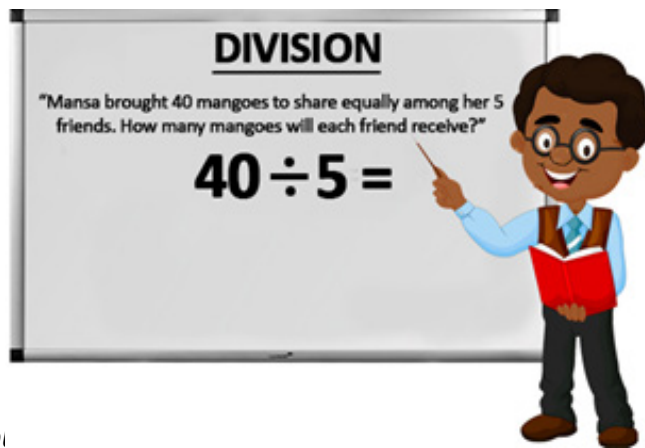
Material required:

Chalk board, counting objects.



Teacher led Activity:

- (a) Revise learner's knowledge for division strategies
- (b) Write division word problems on the board. For example;



*"Mansa brought 40 mangoes to share equally among her 5 friends.
How many mangoes will each friend receive?"*



Lead learners to find out:

- i. What has been given in the problem – number of mangoes to be shared = 40, persons to share the mangoes = 5

- ii. What is the key question in the problem – how many will each of the five persons get?
- iii. What to do to get the answer – share the mangoes equally among the 5 persons
- iv. What mathematical operation is appropriate to use? – (Division or multiplication)
- v. Learners write the mathematical statement for the word problems:
 $40 \div 5 =$



Learners Activity:

- i. Put learners into convenient groups
- ii. Learners write a division problem. For example, to solve $276 \div 3 = \dots?$
- iii. Learners use estimation, and other related strategies to solve the problem
- iv. Learners share their results with the whole class.

Note for the teacher

- Ensure learners work in groups and individually.
- Have learners do further practice using their strategies and ensure that they explain their reasoning.
- Go around and assist.
- Invite learners to demonstrate how to use their strategies to solve the problem.
- Have learners create story problems for their colleagues to solve and vice versa using: “one gets one” strategy.

Reflection/Plenary:

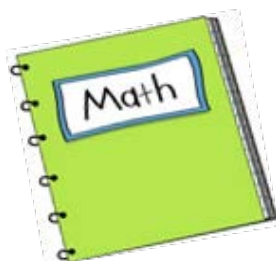
1. Were some problems easier/more difficult for you to solve? Which ones?
2. Have you ever had to divide numbers together in your mind, outside of school?
3. Next time you must division two numbers correctly, what will you do to have your answer right?
4. Which strategy did you use, how did you use your strategy help you?
5. What challenges did you face using this strategy?
6. How did you overcome the challenges?
7. Share your strategies with friends
8. Mention everyday life situations where we use division.

ACTIVITY 23E

Division using Scaffolding Method (The "Big 7")

Material required:

Note book, Worksheets.



Notes to Facilitator:

Revise the idea of multiplication, addition, subtraction and estimation with learners.



Learners Activity:

- Learners look on as teacher writes a division problem on the board involving a 3-digits number divided by a 2-digits number. For example, $288 \div 24 = ?$
- Learners estimate the number of times 24 can be found in 288. For instance, 4.
- Learners multiply their estimated number by 24 and subtract the product from 288 (So $4 \times 24 = 96$ then subtracting 96 from 288 to get 192).
- Learners next estimate the use of 7 based on the remaining difference.
- Learners find the product and do the subtraction ($24 \times 7 = 168$). That is subtracting 168 from 192 to get 24.
- Learners do another estimation as 1. So $24 \times 1 = 24$ then subtracting 24 from 24 to get 0.
- There is nothing more to share.
- Learners find the final answer by adding all the estimations: $4 + 7 + 1 = 12$.
- Learners therefore conclude that: $288 \div 24 = 12$

$$\begin{array}{r|l}
 24 & \begin{array}{r} 288 \\ - 96 \\ \hline 192 \\ - 168 \\ \hline 24 \\ - 24 \\ \hline 0 \end{array} & \begin{array}{l} 4 \\ 7 \\ 1 \\ \hline 12 \end{array}
 \end{array}$$

$\left. \begin{array}{l} 4 \\ 7 \\ 1 \end{array} \right\} +$

Thus: $288 \div 24 = 12$

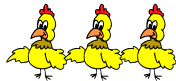
Note for the teacher

- This strategy is nicknamed the “Big 7” because the division box looks like a 7.
- Use estimations: (You may have to use multiples of numbers to select a convenient estimate) “About how many groups of 24 can fit into 288?”
- Accept every learner’s estimation and ask them to multiply by 24 if not more than the divisor.
- Learners will have to use numbers that make sense to them throughout the process; therefore, although the answer to the problem will be the same, the number of steps taken to solve the problem will vary based on Learners estimation skills and number sense.

Reflection/Plenary:

1. What role did you play when working as a team?
2. How does working in groups help?
3. If you are to divide 345 by 35 using the method you used in your group how will you start it?
4. Do you think there will be a remainder or not?
5. Solve this division problem $345 \div 35$ on the board.

MENTAL MATHS ACTIVITIES

“Guess My Number” (Show a number of objects e.g. pebbles and get the participants to estimate its number. Have participants count the items to see who made the best guess)	“Thinking of a number: Ones and Tens” (E.g. I am thinking of a number. The number has 6 ones and 2 tens. What is the number? 26)
“Describing Numbers in Equivalent Ways” (Call out a number and ask participants to describe it in relation with other numbers)	“5 more or less than” (Call out a number and participants say the number which is five more, for example, for 4, the correct response is 9)
“Doubles” (Call out a number and participants say a double of the number, for example, 4 the double is 8)	“1 more than double of” or “1 less than double of” (Call out a number and participants state 1 plus a double of the number, e.g. for 8, the answer is $1 + (2 \times 8) = 17$)
“Skip Count” (2s, 5s, or 10s) (Call out a number and participants skip count in multiples of the number until you say stop, e.g. 2 and participants start 2, 4, 6, ..., ...)	“Chicken and Legs” Call out the number of chickens. Children must call out how many legs in total these chickens have. 
“Pairs that sum to 10/20” Call out a number between 1 and 10 (or 1 to 19). Children call out the number that must be added to make 10 (or 20).	“Find number to make 100 with” I call out a number ending in 0, for example 40. Learners have to call out how many more it would take to make 100

GLOSSARY

The Directed Reading Thinking Activity (DRTA) is a comprehension strategy that guides students in asking questions about a text, making predictions, and then reading to confirm or refute their predictions. The DRTA process encourages students to be active and thoughtful readers, enhancing their comprehension.

DRA Directed Reading Activity.

K-W-L (Ogle, 1986) is an instructional reading strategy that is used to guide students through a text. Students begin by brainstorming everything they know about a topic. This information is recorded in the K column of a K-W-L chart.

The KWL chart or table was developed within this methodology and is a form of instructional reading strategy that is used to guide students taking them through the idea and the text. A KWL table is typically divided into three columns. What do you know, want to know and have learnt.

K	-	what do you K now,
W	-	what do you W ant to know
L	-	what have you L earnt

A story map is a strategy that uses a graphic organiser to help learners learn the elements of a book or story. By identifying story characters, plot, setting, problem and solution, learners read carefully to learn the details. There are many different types of story map graphic organisers.