

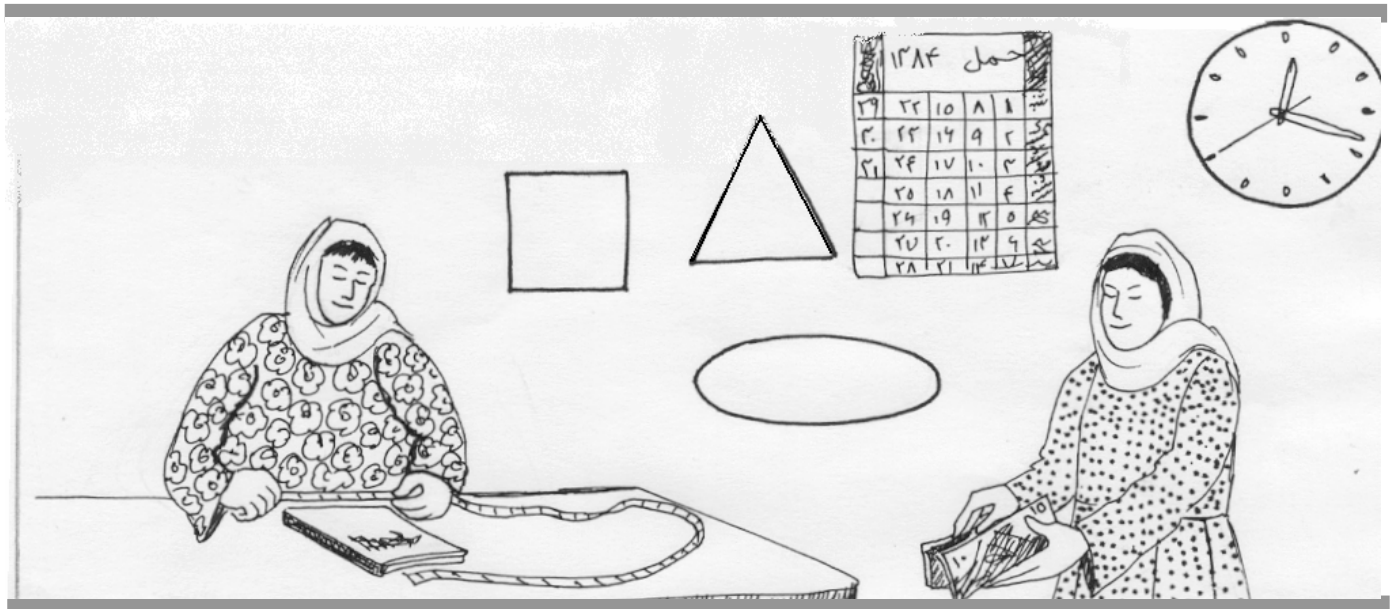


USAID | AFGHANISTAN

FROM THE AMERICAN PEOPLE

Learning for Life Foundations Program

DRAFT



Math

Milestones 1-7

Level 2

English

REACH is a USAID-funded program implemented by Management Sciences for Health (MSH) under contract EEE-C-00-03-00015-00. Partners include The Academy for Educational Development (AED); Health and Development Services (HANDS); JHPIEGO; Technical Assistance, Inc. (TAI); and the University of Massachusetts/Amherst.

Learning for Life is managed by the University of Massachusetts/Amherst and in conjunction with the International Rescue Committee implemented in 12 USAID priority provinces in Afghanistan.

The views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development of the United States Government.

Produced for the Afghanistan Learning for Life Project, funded under the USAID financed REACH Project, by the Center for International Education, School of Education, University of Massachusetts.

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Foundations Math Level 2

Table of Contents

	Page
A. How to Use this Document.....	A-1
B. Curriculum Charts.....	B-1
C. Milestones (MS)	C-1
1. MS 1 Reading, Writing and Understanding Numbers From 1000-10,000. Addition and Subtraction of Four Digit Numbers.	C1-1
2. MS 2 Multiplication and Division of Two-Digit Numbers With Carry Over, Knowing Time and Calendar	C2-1
3. MS 3 Fractions.....	C3-1
4. MS 4 Percents	C4-1
5. MS 5 Measuring Weight, Temperature, Volume Using Greater Numbers, Advanced Measurement).....	C5-1
6. MS 6 Geometry: Triangles And Shapes/ Mapping.....	C6-1
7. MS 7 Understanding Decimals, and Advanced Measurement Using Decimals.....	C7-1

How To Use This Document

This document is for use by the Facilitators, those who will be guiding learners. It contains Milestones and Activities for one subject area.

Curriculum Chart

The Curriculum Chart at the beginning of this book is a compiled list of the subject's milestones and activities. The chart provides an overview by giving the name of each milestone and the instructional activities contained within. Where available, the materials and time needed for each activity are also included, as well as the final milestone evaluation activities.

Milestones (MS)

Following the Curriculum Chart are the milestones and their individual detailed instructional activities. Each milestone is numbered and stated clearly on the first page, with a brief Description of the Milestone. In some cases, milestones have been divided into sub-milestones, which are also listed at the beginning.

Instructional Activities

The instructional activities for the milestone come next, progressing sequentially. Each activity has a title. The objective, duration and materials needed are also given. In some materials, particularly in Level 1, some activities contain a specification for Repetitions. This is a recommendation for the number of times an activity should be repeated, providing for the need for additional practice.

The actual instructions for the activity follow, with the steps either numbered or written in narrative instructional form. When there is specific helpful information provided for the Facilitator, this is set off as a **Note**, or **Information**.

Evaluation Activities

At the end of the instructional activities are a small set of evaluation activities which reflect the content of the milestone. Criteria for 'passing' are also included, where possible.

Learner Books (LB)

For some milestones, there are supplemental materials in the form of Learner Books. These are workbooks that provide related practice and information for the learners. These are generally specified in the Materials list for the activities. These can be found in the Learner Book Files.

Learner Books are available for:

Level 1 (L1)

- Language Milestones 1-6
- Religion/Social Studies Milestones 1-5

Level 2 (L2)

- Language Milestones 1-6
- Religion/Social Studies Milestones 1-3, 6
- Math Milestone 4

Health

- Milestones 4-9

The Draft Nature of These Materials

It is very important to note that these materials are DRAFT. There are numerous inconsistencies in the materials in terms of format, style, information provided, etc. It must be kept in mind that these materials have only been tested once, and need further revision.

Curriculum Chart Foundations Math Level 2

MILESTONE 1: READING, WRITING AND UNDERSTANDING THE NAMES, SYMBOLS AND QUANTITIES FOR 1000-10,000. ADDITION AND SUBTRACTION OF UP TO 4 DIGIT NUMBERS WITH CARRY- OVER			
	Activity	Materials/Preparation	Time
A	Reading, Writing and Understanding 3-Digit Numbers Up to	the 100's number cards, the 10's number cards, the 1's number cards	1 class
B	Sequencing Numbers in the Hundreds (3-digit numbers)	about 20 number cards prepared with a number from 100 to 999 written on each (such as 540, 691, 302, 487, etc)	1 class
C	Estimating Things in the Hundreds	collections of large numbers small objects (more than 100 of each object)	1 class
D	Hundreds of Familiar Things	Cards prepared with these numbers written: (one each) 365, 114, 201, 193, 600, 720, Cards prepared with information written (one each)	1 class
	Money in the Hundreds	fake money: 50's, 100's, 500's	1 class
1	Learning Numbers in the 1000's	1000's, 100's, 10's and 1's cards	1 class
2	Practicing with Reading, Writing and Making 4-Digit Numbers	Number cards: 1000's, 100's, 10's 1's	1 class
3	Sequencing 4-Digit Numbers	about 20 number cards prepared with a number from 1000 to 9999 written on each (such as 5240, 6091, 3702, 4987, etc)	1 class
4	Practice with Money	fake money: 50's, 100's, 500's, 1000's	1 class
5	Thousands of Familiar Things	Cards prepared with these numbers written: (one each) 5000, 6000, 3600, 1384, 2005 Cards prepared with information written	1 class
6	Learning Numbers in the Ten Thousands	board or flipchart paper	1 class
7	Practicing with Reading, Writing and Making 5-Digit Numbers	board or flipchart paper	1 class
8	Sequencing 5-Digit Numbers	about 20 number cards prepared with a number from 10000 to 99999 written on each (such as 52340, 60791, 37102, 49987, etc)	1 class
9	Practice with Numbers from 0 to 10,000 – Reading, Sequencing, Writing	about 30 cards with numbers written on them from 1 to 99,999. (example: 56, 9879, 42355, 2365, 70500, 504, etc – it should be a wide variety of numbers)	1 class
10	Practice with Money Up to 90,000 Afs	fake money: 50's, 100's, 500's, 1000's	1 class
11	Reviewing Addition and Subtraction (with no carry-over)	prepared word problems, large addition chart on flipchart paper	1 class
12	Review with the Adding (and Subtracting) Friends Game	pieces of paper with numbers from 1-10 written	1 class
13	Adding 2-Digit Numbers with No Carry-Over : The Number Squares Game	Two stones and a large piece of paper with the number squares drawn on it	1 class
14	Reviewing and Practicing Addition with Carry-Over	board, large paper, a few stones	1 class
15	Reviewing 2-Digit Subtraction Without Carryover	prepared word problems	1 class
16	Reviewing 2-Digit Subtraction WITH Carryover (Borrowing)	board, large paper, a few stones	1 class

Curriculum Chart Foundations Math Level 2

17	Practice Adding and Subtracting 2 and 3-Digit Numbers with Carry-Over	large paper, a few stones	1 class
18	Practice Game for Adding and Subtracting 4-Digit Numbers	about 15 cards prepared with 3 and 4-digit numbers, + and – symbol cards	1 class
19	Using Large Numbers	prepared word problems	1 class
EVALUATION ACTIVITIES		Materials	
1	Read a 4-digit number out loud.	none	
2	Listen to a 5-digit number and write it down.	none	
3	Add a 4-digit number with carry-over.	none	
4	Count an amount of money up to 10,000 Afs.	none	
5	Subtract a 4-digit number with borrowing.	none	

Curriculum Chart Foundations Math Level 2

MILESTONE 2: 2-DIGIT MULTIPLICATION WITH CARRY-OVER, 1-DIGIT DIVISION, CALCULATIONS WITH TIME			
	Activity	Materials/Preparation	Time
1	Review of Multiplication Facts, games, and patterns of multiplication	sets of number cards from 0 to 12	1 class
2	Review of Division Facts – perfect, and with remainders	none	1 class
3	Multiplying by 10	board or flipchart paper	1 class
4	Multiplying by 100 and Multiples of 100	100's and 1's number cards	1 class
5	One-Digit Multiplication Without Carryover	several digit cards of 1,2, 3; number cards: 12, 14, 13, 21, 22, 23, 11, 10, 20, multiplication symbol card X	1 class
6	One -Digit Multiplication With Carry-Over	digit cards from 1- 9, variety of 2-digit number cards such as 25, 72, 47, 39, 44, 86, etc, multiplication symbol card X, multiplication charts	1 class
7	Practice with Multiplication with Carry-Over – Story Problems	story problems written on separate pieces of paper	1 class
8	Two-Digit Multiplication	piece of paper, 2 small stones	1 class
9	Review of 1-Digit Divisor Problems, With and Without Remainder	digit cards of 2, 4, 3-digit number cards such as 328, etc,	1 class
10	One-Digit Division With Remainder – Story Problems	notebooks, prepared story problems written on pieces of paper	1 class
11	Conversion Of Seconds Into Minutes And Vice Versa By Using Multiplication And Division	watch	1 class
12	Conversion of Hours into Minutes	Watch / clock	1 class
13	How Days Become Nights	globe	1 class
14	To Recognize Days, Months, and Seasons	notebook, pen and flipchart	1 class
EVALUATION ACTIVITIES			
1	Alima’s baby was born 18 weeks ago. How many days old is the baby?		
2	When Hafiza became pregnant, she became anemic. The CHW gave Hafiza 126 iron tablets, and told her to take 3 tablets every day. For how many days will she have enough iron tablets?		
3	Which is more time: 3 minutes or 100 seconds?		

Curriculum Chart Foundations Math Level 2

MILESTONE 3: AN INTRODUCTION TO DIFFERENT TYPES OF FRACTIONS			
	Activity	Materials/Preparation	Time
1	An Introduction to Fractions	an apple, a knife, a sheet of paper, marker and white board	
2	Equal Fractions	sheets of paper, an apple with a knife for each group	
3	Becoming Familiar With Fractions and Writing the Fractional Figures Correctly	geometrical shapes such as circle, rectangle and square made of paper	
4	Understanding Fractions in Food	a pot for water	
5	Explaining Fractions with Liquids	a jug, glasses, water	
6	Distinguishing and Practicing Fractions	a flipchart on which many geometrical shapes are drawn.	
7	Proper & Improper Fractions	paper and a ruler	
8	Comparison of Fractions	paper, a pencil, a ruler and a flip chart	
9	Comparison of Fractions with the Same Numerators but Different Denominators	a sheet of paper with a pencil	
10	Becoming Familiar With Equivalent Fractions	two apples with a knife, a sheet of paper, pencil and a ruler	
EVALUATION ACTIVITIES			
1	A series of 5 fraction-related questions for the learner.		

Curriculum Chart Foundations Math Level 2

MILESTONE 4: PERCENTS			
	Activity	Materials/Preparation	Time
1	Review of Fractions and Circle Parts – Circle Charts with Fractions	Learner book, prepared circles, a glass and a pot of tea	1 class
2	Information In A Visual Form	Learner book, flipchart	1 class
3	Circles With More Than Two Parts	math learner book	1 class
4	Percent Numbers as Part of a Circle	prepared circle cards and fraction/percent cards	1 class
5	Percent and the Rest of the Circle	prepared cards from previous activity, learner book	1 class
6	Making Percent Circles	math learner book	1 class
7	Analyzing Percents	math learner book	1-2 classes
8	Converting Information To Percents	learner book	2 classes
EVALUATION ACTIVITIES			
1	Someone says, “80% of the children in your village are not vaccinated.” Is this good or bad?		
2	Draw a circle and shade 50% of it.		
3	Draw a circle and shade 10% of it.		

Curriculum Chart Foundations Math Level 2

MILESTONE 5: ADVANCED MEASUREMENT			
	Activity	Materials/Preparation	Time
1	Measuring Things Smaller Than 100 cm	Measuring tape	1 class
2	How Tall Are We?	Tape measure	1 class
3	Measurement of Objects Larger Than 200 cm	Measuring tape	1 class
4	Conversion of Kilometer into Meter and Centimeter		1 class
5	Distance Between the Earth and the Moon	Image of the moon and the earth	1 class
6	Conversion of Kilogram to Gram and Vice Versa	board, chalk, notebook, and pen	1 class
7	How Many Kilograms Are We?	Flipchart, notebook, and pen	1 class
8	Determining Approximate Weights		1 class
9	Measuring with Liter	scissor, pen and coca-cola bottle	1 class
10	To Recognize Small Units of Measurement Such as Milliliter	syrup bottle	1 class
11	Conversion of Liter and Milliliter	1 liter pot, syringe, and water	1 class
12	Water Consumption (in liter)	bucket, 1-L pot	1 class
13	How the Heart Works	A picture of heart on the flipchart	1 class
14	Loss of Body Water During Diarrhea	Picture, and text of activity	1 class
15	How to Use a Thermometer	thermometer picture	1 class
16	Temperature of Human's Body, Water and Weather	Thermometer, world map	1 class
EVALUATION ACTIVITIES		Materials	
1	How can you use a thermometer?		
2	How many kilogram equals to 1 ton?		
3	What percent of our body is water?		
4	Is the earth bigger or the moon?		

Curriculum Chart Foundations Math Level 2

MILESTONE 6: GEOMETRICAL SHAPES AND MAPPING SKILLS (DRAWING SHAPES AND SYMBOLS)			
	Activity	Materials/Preparation	Time
1	To Introduce Geometrical Shapes	Class-board, chalk and flipchart	1class
2	How to Make a Scalene Triangle	board, nails, rubber band	1class
3	Comparing Triangles, Squares, and Rectangles	board, paper, and scissor	1class
4	Making Different Polygons	pencil and sample of steeple	1class
5	To Use Drawn Shapes and Develop Them Into New Different Forms	paper, materials to make a practical board: piece of wood with nails hammered in 3 rows, rubber bands	1class
6	Geometrical Puzzle	pen, notebook, and geometrical shapes	1class
7	Similarities and Differences in Artistic Shapes	artistic drawing	1class
EVALUATION QUESTIONS		Materials	
1	None		

Curriculum Chart Foundations Math Level 2

MILESTONE 7: DECIMAL NUMBERS			
	Activity	Materials/Preparation	Time
1	Classification/Grading	Number cards	1 class
2	Fractions and the Comparison of Fractions	Flipchart, fractional numbers cards, apple, pen, notebook, board and chalk	1 class
3	Introduction of Decimals	Flipchart	1 class
4	Measuring with Centimeters and Millimeters	Ruler, pencil and any thing else like rulers which has short lengths	1 class
5	Classification/Grading of Decimal Numbers	Decimal charts and symbols	1 class
6	Decimal Point In Three-Digit Numbers	Paper, scissor, notebook, pen, board and chalk	1 class
7	Measuring More Than One Meter	Notebook, pen and measurement tape	1 class
EVALUATION ACTIVITIES		Materials	
1	None		

**MILESTONE 1:
READING, WRITING AND UNDERSTANDING THE NAMES, SYMBOLS AND
QUANTITIES FOR 1000-10,000. ADDITION AND SUBTRACTION OF UP TO 4
DIGIT NUMBERS WITH CARRY-OVER**

Sub-Milestones

- *0: REVIEW - Numbers in the Hundreds*
- *1: Numbers in the Thousands*
- *2: Adding and Subtracting 4-Digit Numbers*

Materials Needed:

- 1000's number cards
- 100's number cards
- 10's number cards
- 1's number cards
- Large amounts of small objects like raisins, beans, etc. (hundreds)

Sub-milestone 0 - REVIEW

- *Numbers in the Hundreds*

REVIEWING NUMBERS IN THE HUNDREDS

NOTE: These first 6 activities (Activities A - E) can be used as review of numbers less than 1000 for new Level 2 Learners if necessary. These activities will provide a strong foundation for understanding numbers.

Milestone 1

Activity A: Reading, Writing and Understanding 3-Digit Numbers Up to 1000

Objective: to review the structure of numbers in the hundreds, and the place value of the digits

Materials: the 100’s number cards, the 10’s number cards, the 1’s number cards

Activity:

1. The Facilitator should review counting up to 100 with the Learners. First review
2. the “one’s” place numbers: 1,2,3,4,5,6,7,8,9.
3. They should then count by 10’s (10, 20, 30, etc) up to 100. It is important to remind the Learners what the tens mean: 30 means 3 tens, 80 means 8 tens, etc.
4. The Facilitator should write vertically on the board the one’s and ten’s→
5. The Facilitator asks the Learners to then start counting out loud from 90: 90,91,92,93,94,95,96,97,98,99: next is 100. Write 100 in the chart. What will come next? Let the Learners count above 100 and write some numbers on the board such as 101, 102, 103, etc. as well as higher numbers such as 125, 174, etc. (But all the numbers do not need to be written) Let the Learners practice reading numbers above 100.
6. Write 199 on the board and ask Learners to read it. Then what comes after 199? 200 which means 2 hundreds. Again, the Learners should practice reading and saying numbers above 200 such as 225, 236, 285, etc and then 299. What comes after 299? 300 which means 3 hundreds. Again, practice with numbers above 300...
7. The Facilitator should use this technique to show 400, 500, etc up to 999.

10	1
20	2
30	3
40	4
50	5
60	6
70	7
80	8
90	9

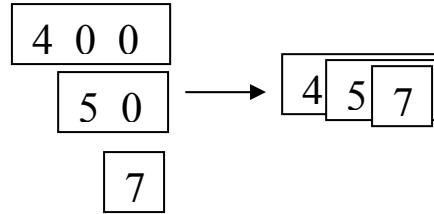
100	10	1
200	20	2
300	30	3
400	40	4
500	50	5
600	60	6
700	70	7
800	80	8
900	90	9

← The Facilitator should write the column of hundreds next to the tens column, and the Learners should copy this table.

8. The Facilitator should show the number cards and show how to put the numbers together to form larger numbers and how to read the numbers:

EXAMPLE:

This example shows that 457 is made of 400 and 50 and 7, or 4 hundreds, and 5 tens, and 7 ones.



9. The Facilitator should show the Learners the concept of the place value using a table with spaces for each position. She should write on the board:

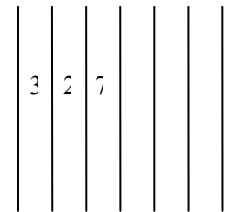
She should explain that the position of each digit in a number is very important and tells how big the number is. So the number 457 (in the example above) has 4 in the hundreds place, 5 in the tens place, and 7 in the ones place. This is also shown with the number cards: 400, 50 and 7.

Hundreds	Tens	Ones
4	5	7

NOTE: Using the numbers cards together with the chart of khaneha will help the Learners understand what the numbers mean and how to write them properly. The Facilitator should use both the chart **and** the cards to show how to understand a 3-digit number.

NOTE: It is also important to understand that the place value gets larger from right to left, NOT from left to right. The ones position is always on the right. But we **READ** the numbers starting from the left, and we write them from left to right. This is very important for the learners to understand!!!!

10. The Facilitator should emphasize the importance of writing the digits in their proper places. To practice this, the Learners should turn their notebooks sideways and the Facilitator says numbers such as 573, or 689, or 327. The Learners must write the numbers in the lines of their notebook. It may help if they write “hundreds”, ‘tens’, and ‘ones’ at the top of each line, like on the chart.



11. Working in small groups the Learners should practice with the number cards using the 100’s, the 10’s and the 1’s cards:

- Reading numbers: the cards are all mixed up on the table, upside down. One Learner takes a hundreds card a (long card), a tens card, and a ones card. She puts them together to form a 3-digit number, and then must read the number out loud.
- Making numbers: The cards are laid out in order on the table. One Learner says a number out loud (such as seven hundred and sixty-two). Other Learners must then make the number with the cards.

- Writing numbers: One Learner makes a number with the cards (such as 356) but she does not let others see the number. She then reads the number out loud (“three hundred and fifty-six”). The other Learners must then write the number in their notebooks.

NOTE: It is very important that the Learners also have practice with numbers that contain 0, such as 509 or 640 or 303, etc.

12. The Learners can also play games with the number cards. The Facilitator distributes the cards to the Learners. She tells the group to form a particular number. Those with the correct cards must get up and stand together to form the number. For example, the Facilitator says, “Make the number 963.” The person with 900, and the person with 60 and the person with 3 must stand and put their cards together to make the number.

Milestone 1

Activity B: Sequencing Numbers in the Hundreds (3-digit numbers)

Objective: to practice comparing the value of numbers in the hundreds

Materials: about 20 number cards prepared with a number from 100 to 999 written on each (such as 540, 691, 302, 487, etc)

Activity:

Various activities to provide practice in valuing and ordering numbers:

- The cards are placed on the table upside down. Each Learner takes 5 cards and turns them over and lays them out in order from smallest to largest. This can be done as a contest to see who can finish fastest.
- Each Learner has 5 cards in front of her. The Facilitator gives the Learners instructions quickly, such as, “Hold up your largest card!” or “Hold up your smallest card!” or “Hold up the card that is in the middle of all the numbers!” or “Hold up all the numbers you have that are greater than 375!” (or some other number, or smaller than, etc).
- Each Learner takes one card from the selection and they must stand and arrange themselves in order. To make this more challenging and interesting, the Learners can try to do this without speaking.
- Two Learners each have a stack of the cards upside down. They quickly turn over one card each and compare: whoever has the higher number wins, and keeps the cards. They then turn over the next card and again compare. This should be done quickly as a game of speed and practice.

Milestone 1

Activity C: Estimating Things in the Hundreds

Objective: to develop a sense of the physical size of numbers in the hundreds

Materials: collections of large numbers small objects (more than 100 of each object)

Activity:

1. The Facilitator puts small objects in a jar or box, etc. This can be raisins or beans, etc but there must be hundreds (over 200 is best) of the object. It is best to have 2 or 3 different objects and different amounts.
2. The Learners are asked to estimate or guess how many of each object they think there are in the jar or box, etc. They must write down their estimates.
3. Now in small groups they must count how many objects are in each. They should count in 10's, separating the objects into piles of 10 each. They can then group 10 groups of 10 into 1 group of 100. They must count the exact amount of each object and write them down.
4. They then compare to the guesses made by the Learners. The winner is the person whose guess was closest to the actual amount.

NOTE: Deciding who was closest will involve subtraction! But let the Learners figure it out themselves in any way they can; let them decide who is the winner...

Milestone 1

Activity D: Hundreds of Familiar Things

Objective: to become aware of quantities in the hundreds around us

Materials: Cards prepared with these numbers written: (one each) 365, 114, 201, 193, 600, 720,

Cards prepared with this information written (one each): “days in one year”, “number of suras in the Koran”, “number of bones in the body”, “number of countries in the world”, “number of times your heart beats in 10 minutes”, “number of hours in one month”

Activity:

1. The Facilitator gives all the number and information cards to the Learners. The cards should be mixed up.
2. The Learners must try to match each number with the correct information. For example, they must match ‘365’ with the card that says ‘number of days in one year’. They may not know the correct answers, but they should try to guess what the reasonable answers might be.
3. After they have matched all the cards, the Facilitator then comes and orally tells them the correct information, if there are any mistakes. The Learners should then record this information in their notebooks. They can also add any other information they may know.

Correct answers:

114	Number of suras in the Koran
193	Number of countries in the world
201	Number of bones in your body
365	Number of days in one year
600	Number of times your heart beats in ten minutes
720	Number of hours in one month

Milestone 1

Activity E: Money in the Hundreds

Objective: to practice counting money in the hundreds

Materials: fake money: 50's, 100's, 500's

Activity:

1. The Facilitator should give each Learner a bundle of money that will add up to less than 1000 Afs
2. Each Learner should be instructed to count her money. If necessary, the Facilitator should show the Learners how to organize their money by grouping it and then starting to count with the highest bills first. (For example, if a Learner has 3 hundreds, 1 five hundred, and 2 fifties, she should first arrange the money in order from largest to smallest: 500's, 100's, 50's, 20's. She should then begin counting in that order as well: 500 → 600, 700, 800 → 850, 900 → Total = 960 Afs.
3. She should write down the amount she has.
4. Each Learner should exchange money with other Learners and practice counting different amounts of money.

☺ **DISCUSSION:** Each Learner should then write a short list of what she would do if she were given 900 Afs. (Spend it? If so, on what? - Save it? For what? - Give it to someone else? Who and why?) The Learners should then discuss their ideas and 'plans' for what they would with 900 Afs.

Sub-milestone 1

- *Numbers in the Thousands*

Milestone 1

Activity 1: Learning Numbers in the 1000's

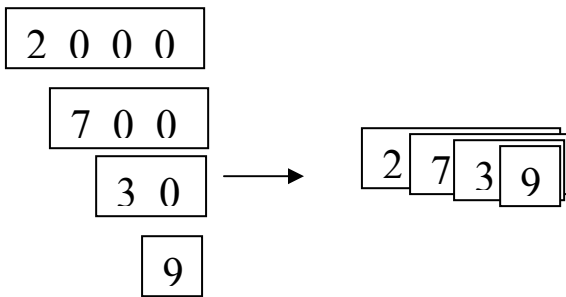
Objective: to learn the names, symbols and structure (place value) of 4-digit numbers

Materials: 1000's, 100's, 10's and 1's cards

NOTE: The pattern of teaching and learning the numbers in the thousands will be the same as learning the numbers in the hundreds. For more details, see Activity 0 above.

Activity:

1. The Learners should review the 100's by counting from 100 to 900 by 100's (100,200, 300, etc). After 900, we must shift to the next place: the thousands. After 999 the next number is 1000.
2. After 1000 comes 1001, 1002, 1003, etc.
3. Counting and writing through the numbers in the thousands place, the Facilitator should ask the Learners to figure out the pattern and count: 1000, 2000, 3000, etc.
4. The Facilitator should write the pattern on the board, extending the previous chart:
5. She should then use the 1000's card to show how to construct and deconstruct 4-digit numbers, and how to read them, how to say the numbers:



1000	100	10	1
2000	200	20	2
3000	300	30	3
4000	400	40	4
5000	500	50	5
6000	600	60	6
7000	700	70	7
8000	800	80	8
9000	900	90	9

“two thousands, seven hundreds, three tens and nine ones
= two thousand seven hundred and thirty-nine”

6. The Facilitator should also show the chart of place value and how to use it:

Example, for the number 5362:

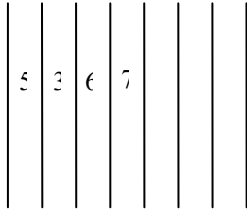
The Facilitator should say several numbers aloud for the Learners to write in a chart.

NOTE: Doing this chart work along

Thousands	Hundreds	Tens	Ones
5	3	6	2

with the cards will help the Learners understand the numbers much better.

7. The Learners should also practice writing these large numbers properly by turning their notebooks sideways to make sure that the numbers are correctly aligned. The



Facilitator or an advanced Learner can say numbers aloud for the Learners to write. Or the Learners can take a number card from each set (1000's, 100's, 10's and 1's) and use those numbers to make a 4-digit number and write it correctly in their notebooks. EXAMPLE: If someone takes a 3000 card, a 700 card, a 40 card and a 9 card, they would then write 3749 in their notebook

and in a place value chart to make the number, and then read it.

Milestone 1

Activity 2: Practicing with Reading, Writing and Making 4-Digit Numbers

Objective: to become comfortable with reading and writing 4-digit numbers

Materials: Number cards: 1000's, 100's, 10's 1's

Activity:

For practice with these numbers, the Learners should work in small groups with the number cards as in Activity 1 above, doing the activities for Reading, Writing and Making Numbers:

- Reading numbers: the cards are all mixed up on the table, upside down. One Learner takes a thousands card (longest), a hundreds card (long card), a tens card, and a ones card. She puts them together to form a 4-digit number, and then must read the number out loud.
- Making numbers: The cards are laid out in order on the table. One Learner says a number out loud (such as five thousand seven hundred and sixty-two). Other Learners must then work together to form the number with the cards, and then write the number properly.
- Writing numbers: One Learner forms a number with the cards (such as 8356) but she does not let others see the number. She then reads the number out loud (“eight thousand three hundred and fifty-six”). The other Learners must then write the number in their notebooks, with their notebooks turned sideways to write the number properly.

NOTE: It is very important that the Learners also have practice with numbers that contain 0, such as 4509 or 6075 or 3004 or 6730 or 2400, etc.

Milestone 1

Activity 3: Sequencing 4-Digit Numbers (same as Sequencing 3-Digit Numbers: Activity B above)

Objective: to develop skill at recognizing and comparing the values of numbers

Materials: about 20 number cards prepared with a number from 1000 to 9999 written on each (such as 5240, 6091, 3702, 4987, etc)

Activity:

The Learners should do various activities to practice valuing and ordering numbers:

- The cards are placed on the table upside down. Each Learner takes 5 cards and turns them over and lays them out in order from smallest to largest. This can be done as a contest to see who can finish fastest. They can also arrange more than 5 cards at one time as well.
- Each Learner has 5 cards in front of her. The Facilitator gives the Learners instructions quickly, such as, “Hold up your largest card!” or “Hold up your smallest card!” or “Hold up the card that is in the middle of all the numbers!” or “Hold up all the numbers you have that are greater than 3175!” (or some other number, or smaller than, etc).
- Each Learner takes one card from the selection and they must stand and arrange themselves in order. To make this more challenging and interesting, the Learners can try to do this without speaking. After they have arranged themselves, they should then each read their number out loud.

Milestone 1

Activity 4: Practice with Money

Objective: to apply numbers in the 100's and 1000's through money

Materials: fake money: 50's, 100's, 500's, 1000's

Activity:

1. Working in a small group, first each Learner is given a bundle of money that is between 1000 and 9000 Afs.
2. Each Learner must count her money and write down her total. She should again practice by organizing the bills and start counting from the largest bill first.
3. They should all then exchange bundles with other Learners and count other bundles of money. They should determine which bundle contains the most money.
4. © **DISCUSSION:** The Learners should then sit in their small groups and generate a list of things that can be related to 5000 Afs: relate to salaries (less than 5000? More than 5000?), how much certain things cost, or how much certain things can be sold for, etc. They can think of and write about what they would do with 5000 Afs.

Milestone 1

Activity 5: Thousands of Familiar Things

Objective: to become aware of common things that are in the thousands and get a sense of the size of numbers in the thousands

Materials: Cards prepared with these numbers written: (one each) 5000, 6000, 3600, 1384, 2005

Cards prepared with this information written (one each): “Number of years since Jesus was born”, “Number of years since The Prophet was born”, “Number of different languages spoken in the world”, “Number of times a baby’s heart beats in one hour”, “Number of times your heart beats in one hour”

Activity:

1. The Facilitator gives all the number and information cards to the Learners. The cards should be mixed up.
2. The Learners must try to match each number with the correct information, as they did with the thousands activity. They may not know the correct answers, but they should try to guess what the reasonable answers might be.
3. After they have matched all the cards, the Facilitator then orally tells them the correct information, if there are any mistakes. The Learners should then record this information in their notebooks. They can also add any other information they may know.

Correct answers:

1384	Number of years since The Prophet was born
2005	Number of years since Jesus was born
3600	Number of times your heart beats in one hour
5000	Number of different languages spoken in the world
6000	Number of times a baby’s heart beats in one hour

Sub-milestone 2

- *Numbers in the Ten Thousands*

Milestone 1

Activity 6: Learning Numbers in the Ten Thousands

Objective: to understand the continuation of the number system and the names and structure of 5-digit numbers

Materials: board or flipchart paper

Activity:

NOTE: The pattern of teaching and learning the numbers in the ten thousands will be the same as learning the numbers in the thousands. For more details, see Activity 1 above.

1. The Learners should review the 1000's by counting from 1000 to 9000 by 1000's (1000,2000, 3000, etc). After 900, we must shift to the next khane: the thousands. After 9999 the next number is 10 000.
2. After 10 000 comes 10 001, 10 002, 10 003, etc.
3. Counting and writing through the numbers in the ten thousands khane, the Facilitator should ask the Learners to figure out the pattern and count: 10 000, 20 000, 30 000, etc. ☼NOTE: It is important to emphasize how to read and say the numbers, showing that 20 000 is 20 thousands: 20 and 000. The Learners should see the 20 or 30 or 40, etc as separate, but attached to the thousands. This will make it easier for them to read complex numbers.
4. The Facilitator should write the pattern on the board, extending the previous chart:

10000	1000	100	10	1
20000	2000	200	20	2
30000	3000	300	30	3
40000	4000	400	40	4
50000	5000	500	50	5
60000	6000	600	60	6
70000	7000	700	70	7
80000	8000	800	80	8
90000	9000	900	90	9

5. The Facilitator should also show the chart of place value and how to use it:

Example, for the number 45362:

Ten Thousands	Thousands	Hundreds	Tens	Ones
4	5	3	6	2

The Facilitator should say several numbers aloud for the Learners to write in a chart.

NOTE: This transition between writing and reading is very critical: the Learners must understand that to read the number 45,362, they must read the 45 first, saying “forty-five thousand” – they should NOT say “45 **ten** thousand”. Then the second part of the number should be read separately: “three hundred sixty-two”. This should be explained: 45 thousands means 4 ten thousands and 5 thousands.

The Learners must be given MANY examples of problems written on the board and how to read them correctly. The Facilitator should write at least 10 examples and read them for the Learners and the Learners should also read each number.

6. The Learners should also practice writing these large numbers properly by turning their notebooks sideways to make sure that the numbers are correctly aligned. The Facilitator or an advanced Learner can say numbers aloud for the Learners to write.

5	3	6	7	2				
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Milestone 1

Activity 7: Practicing with Reading, Writing and Making 5-Digit Numbers

Objective: to become more comfortable with reading and writing numbers in the ten-thousands

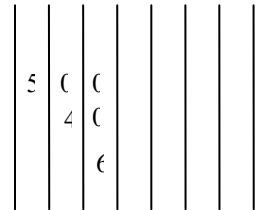
Materials: board or flipchart paper

Activity:

NOTE: In this activity, the Learners will break a number down into its parts as they did with the number cards in earlier activities, but by writing:

- Starting with a smaller number like 546, the Facilitator reminds the Learners how to break down the number: $546 = 5 \text{ hundreds, } 4 \text{ tens and } 6 \text{ ones}$. This is shown by $546 =$

$$\begin{array}{r} 500 \\ 40 \\ 6 \end{array}$$



This should be written vertically on the board, and the Learners also write in their notebooks turned sideways so the numbers are lined up. They should break down some other examples such as 837 (800, 30, 7)

- The next example should be with thousands: $7583 = 7\ 000$

$$\begin{array}{r} 500 \\ 80 \\ 3 \end{array}$$

Again, examples should be written in the notebooks turned sideways.

- The next step is to break down numbers in the ten thousands: $34,926 =$

$$\begin{array}{r} 30,000 \\ 4\ 000 \\ 900 \\ 20 \\ 6 \end{array}$$

This can also be shown as:

$$\begin{array}{r} 34,926 = \\ 34\ 000 \text{ (“thirty-four thousand”)} \\ 900 \\ 20 \\ 6 \end{array}$$

4. The Facilitator should write many examples for each size of number on the board and the Learners should break down the numbers as shown and practice reading the numbers out loud.

NOTE: It is very important that the Learners also have practice with numbers that contain 0, such as 45079 or 60745 or 30004 or 60730 or 24006, etc.

Milestone 1

Activity 8: Sequencing 5-Digit Numbers (same as Sequencing 3-Digit Numbers: Activity B above)

Objective: to practice identifying and comparing the value of 5-digit numbers

Materials: about 20 number cards prepared with a number from 10000 to 99999 written on each (such as 52340, 60791, 37102, 49987, etc)

Activity:

Various activities to provide practice in valuing and ordering numbers:

1. The cards are placed on the table upside down. Each Learner takes 5 cards and turns them over and lays them out in order from smallest to largest. This can be done as a contest to see who can finish fastest. They can also arrange more than 5 cards at one time as well. They should read each number aloud after all have been arranged.
2. Each Learner has 5 cards in front of her. The Facilitator gives the Learners instructions quickly, such as, “Hold up your largest card!” or “Hold up your smallest card!” or “Hold up the card that is in the middle of all the numbers!” or “Hold up all the numbers you have that are greater than 31750!” (or some other number, or smaller than, etc).
3. Each Learner takes one card from the selection. They must all stand and arrange themselves in order. To make this more challenging and interesting, the Learners can try to do this without speaking. After they have arranged themselves, they must then each read their number out loud.

Milestone 1

Activity 9: Practice with Numbers from 0 to 10,000 – Reading, Sequencing, Writing

Objective: to become more comfortable with a variety of sizes of numbers

Materials: about 30 cards with numbers written on them from 1 to 99,999. (example: 56, 9879, 42355, 2365, 70500, 504, etc – it should be a wide variety of numbers)

Activity:

The Learners should practice and improve their skills with recognizing and reading numbers:

- **Sequencing:** The cards are placed on the table upside down. Each Learner takes 5 cards and turns them over and lays them out in order from smallest to largest. This can be done as a contest to see who can finish fastest. This can be done with more than 5 cards as well. The Learner should read the numbers after they are arranged.
- **Reading and Writing:** This can be done in teams. One person takes a card and reads the number outloud. The two teams must then quickly write that number correctly. The team that writes the number correctly and neatly first wins.
- **Reading:** All of the cards are placed on the table with the numbers showing. One person says one of the numbers outloud. The two players must then remember the number and quickly find it among the cards. The winner is the one who finds the card first.

Milestone 1

Activity 10: Practice with Money Up to 90,000 Afs

Objective: to apply skills with large numbers to money and finances

Materials: fake money: 50's, 100's, 500's, 1000's

Activity:

1. Working in a small group, first each Learner is given a bundle of money that is between 10000 and 90000 Afs.
2. Each Learner must count her money and write down her total. She should again practice by organizing the bills and start counting from the largest bill first.
3. They should all then exchange bundles with other Learners and count other bundles of money. They should determine which bundle contains the most money.
4. The Learners should then sit in their small groups and generate a list of things that can be related to 50,000 Afs: relate to salaries (less than 50,000? More than 50,000?), how much certain things cost, or how much certain things can be sold for, etc. They can think of and write about what they would do with 50,000 Afs.

☺ **DISCUSSION:** More Information

The Facilitator should write the following statements on the board. This information will help the Learners start to understand the size of numbers in the ten thousands, and start to become aware of the numbers of things around us:

- We have approximately 90,000 hairs on our head.
- There are approximately 80,000 hadiths.
- The world is 40,000 km around.
- On a clear night, we can see approximately 12,000 stars in the sky.
(But there are MANY more that we can't see! In the universe there are more than 10,000,000,000,000 stars. And our sun is one of these stars.)

NOTE: Even though the Learners may not know the name of such a large number, it doesn't matter – they can see by all the zeros what a large number it is!

The Learners can then discuss the meaning of such large numbers, and other places or sources of large numbers – such as stitches in a rug, or number of people living in a city, or number of taxis in a city, etc.

Sub-milestone 3

- *Adding and Subtracting 4-Digit Numbers*

Milestone 1**Activity 11: Reviewing Addition and Subtraction (with no carry-over)**

Objective: to review addition and subtraction facts in preparation for adding larger numbers

Materials: prepared word problems, large addition chart on flipchart paper

Activity:

1. **Review:** The Facilitator should first ask the Learners what addition means, in their own words. In math as well as life, what does it mean to add? [It means to put together, to combine.] What is the symbol for addition in math? [+]
2. The Facilitator shows the large addition chart and how to use it.

Example: $6 + 7 = ? = 13$. This large addition chart should be posted on the wall, or the Learners can copy it into their notebooks for their future use.

Addition Chart											
+	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	8	9	10	11	12
3	3	4	5	6	7	8	9	10	11	12	13
4	4	5	6	7	8	9	10	11	12	13	14
5	5	6	7	8	9	10	11	12	13	14	15
6	6	7	8	9	10	11	12	13	14	15	16
7	7	8	9	10	11	12	13	14	15	16	17
8	8	9	10	11	12	13	14	15	16	17	18
9	9	10	11	12	13	14	15	16	17	18	19
10	10	11	12	13	14	15	16	17	18	19	20

solve a subtraction problem, such as $14 - 8 = ?$ [First find 8 on the top, then go down to 14, then across to find the answer: 6]

3. The Facilitator should then ask what 'subtraction' means. [to take away]. What is the symbol for subtraction? [-] And what is the connection between addition and subtraction? [they are opposites]
4. She should show how to use the Addition chart to solve a subtraction problem, such as $14 - 8 = ?$ [First find 8 on the top, then go down to 14, then across to find the answer: 6]
5. The Facilitator gives a series of realistic word problems for the Learners to solve. The Facilitator should show how to set up the problems on paper to calculate the answer if the Learners need help.
6. At least three addition and three subtraction problems should be given. If Learners are still having difficulty solving the problems, more practice problems should be given.
7. Sample 1-Digit problems:

- If your family has 10 members, and you all visit your sister's family, which has 7 people, how many people will be at your sister's house all together?
- If you have 15 goats and you sell 9 of them, how many will you have left?
- If you make 8 carpets to sell and your sister-in-law makes 6 carpets to sell, how many carpets will you sell all together?
- If you have 6 chickens and then 4 chicks grow into chickens, how many chickens will your family have?
- If you have 18 Afs and you need to buy 12 Afs worth of sugar, how much money will you have left?
- If your daughter has 7 Afs and you give her another 5 Afs, how much money will she have?

Milestone 1

Activity 12: Review with the Adding (and Subtracting) Friends Game

Objective: to review and practice addition and subtraction facts

Materials: pieces of paper with numbers from 1-10 written

Activity:

1. Give one piece of paper with a number to each Learner.
2. The Learners should stand up and walk slowly in a circle.
3. Then the Facilitator should tell them to join with others so that their numbers together add or subtract to a particular number. For example, the Facilitator says, "Add or subtract to make 12." Then there are many groups that can be formed: $2+10$, $4+3+5$, $20-8$, etc.
4. Each group must find each other quickly and stand together. They must then tell how they calculated with their numbers to make the correct answer.

NOTE: This should be done as a competition, where the women try to form groups quickly and not be left out. This can be done over and over, as it gives very good practice in addition and subtraction and is fun and energizing!

Milestone 1**Activity 13: Adding 2-Digit Numbers with No Carry-Over : The Number Squares Game****Objective:** to review the correct way to write and add 2-digit numbers**Materials:** Two stones and a large piece of paper with the number squares drawn on it as shown below**Activity:**

- Review of how to solve 2-Digit problems: The Facilitator must first show an example problem of addition such as $53+23$. She must emphasize:
 - Writing the problem vertically
 - Making sure the ones numbers and tens numbers are lined up correctly.
 - Start adding the columns from the right side, from the ones. Add the ones first, and then the tens:

$$\begin{array}{r} 53 \\ + 23 \\ \hline 73 \end{array} \quad \text{NOT} \quad \begin{array}{r} 53 \\ + 23 \\ \hline \end{array}$$

- To make it easier to line up the numbers, the Learners should turn their notebooks and write in the lines:

- The Addition Chart can be used to help if the Learners do not have the addition facts memorized (such as $4+3$ or $6+2$, etc) .

		5	3	
+		2	3	
		<hr/>		
		7	6	

- Using the number cards, she should also show that for a problem such as 53 , each number can be broken down:

$$\begin{array}{r} 53 \\ + 23 \\ \hline \end{array} = \begin{array}{r} 50 + 3 \\ + 20 + 3 \\ \hline \end{array}$$

Now it is easy to solve:, $3+3 = 6$ and $50+20 = 70$, so the answer is $6+70$, or 76 .

- She should give 2 sample problems for the Learners to solve such as $42+31=$ and $63+25=$.

5. To prepare for the Number Squares Game, first a large paper with 9 squares must be drawn. In each square write a small 2-digit number that can be added **without carry-over** to other numbers in the squares:

Example:

23	41	33
15	10	14
52	11	24

6. Two or more people can play the game. They sit around the square of numbers with pencil and paper and 2 stones.
7. To play, one person closes her eyes and drops two stones on the paper. Once she opens her eyes, she must then correctly write down and add the two numbers that are in the squares where the stones fell.
8. Each player or team does this in turns, and the person or team with the highest total wins that round, and gets one point.
9. At the end of the game, whoever has the most points wins.

NOTE: Additional Practice:

10. This game can be played many times with different combinations of numbers in the squares. But at this point, the numbers should still be without carryover.

Milestone 1

Activity 14: Reviewing and Practicing Addition with Carry-Over

Objective: to review and practice the correct way to add with carry-over and understand the specific steps involved

Materials: board, large paper, a few stones

Activity:

1. The Facilitator should give the Learners a problem to solve that has carry-over:

Example:
$$\begin{array}{r} 53 \\ + 29 \\ \hline \end{array}$$

She should ask them to solve it, or explain how to solve it.

2. She should then review how to solve the problem properly with carry-over, explaining each step carefully and remembering to write the numbers correctly in line:

$$\begin{array}{r} + 53 \\ \hline 29 \end{array} \qquad \begin{array}{r} 53 \\ + 29 \\ \hline \end{array}$$

The Steps to Solving Addition with Carry-Over

a. Write the problem with the numbers in line from the right side.

$$\begin{array}{r} 3 \\ +9 \\ \hline 12 \end{array}$$

b. Add the numbers in the ones place: $3+9 = 12$.

$$\begin{array}{r} 1 \\ + 53 \\ \hline 29 \end{array}$$

$$\begin{array}{r} 1 \\ 53 \\ + 29 \\ \hline 2 \end{array} \qquad \begin{array}{r} 3 \\ +9 \\ \hline 12 \end{array}$$

c. Since 12 is $10+2$, we must only keep the 2 in the ones place, and take the 1 ten to the tens place. We carry 1 ten to the tens column, and write the 2 in the ones column.

$$\begin{array}{r} 1 \\ 5 \\ +2 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 1 \\ + 53 \\ \hline 29 \end{array}$$

$$\begin{array}{r} 1 \\ 53 \\ + 29 \\ \hline 82 \end{array} \qquad \begin{array}{r} 5 \\ +2 \\ \hline 8 \end{array}$$

d. In the tens place, we now have 1 from carrying over, and $5 + 2$. $1+5+2 = 8$.

e. Write 8 as the answer in the tens column.

f. The final answer is 8 tens and 2 ones, or 82.

2. The Facilitator can also again show how to break down the numbers using the number cards:

$$\begin{array}{r} 53 \\ + 29 \end{array} = \begin{array}{r} 50 + 3 \\ + 20 + 9 \end{array}$$

In this case, $3+9 = 12$, which is greater than 9, so the 10 must be carried over. The 2 is left behind, and then the tens are added: $50+20+10 = 80$, and $2+80 = 82$, the answer.

3. The Facilitator should give another sample problem to the Learners to practice.

4. Then they should practice further with the Number Squares Game. This time, any 2-digit numbers can be written in the squares, such as:

23	41	33
15	10	14
52	11	24

5. The game is played in the same way as before, where the players throw 2 stones and add the numbers that the stones fall upon.

11. The game can also be played with 3 stones, where the players add 3 numbers, such as $45+69+56$.

12. The teams or players should keep track of their numbers, and the team that has the highest total at the end is the winner.

Milestone 1

Activity 15: Reviewing 2-Digit Subtraction Without Carryover

Objective: to review and practice how to correctly write and solve subtraction problems

Materials: prepared word problems

Activity:

1. The Facilitator should give the Learners several 2-digit subtraction word problems. She should emphasize to write the problems neatly, with the numbers in line. They can write in their notebooks turned sideways.

2. **Example:**

$$\begin{array}{r} 65 \\ - 41 \\ \hline \end{array}$$

- a. Write the numbers in line (vertically), with the larger number on top.
- b. Starting on the right (the ones place) subtract the bottom number from the top (5-1=4) and write below.
- c. In the tens place, subtract the bottom number from the top (6-4 = 2) and write below.

$$\begin{array}{r} 65 \\ - 41 \\ \hline 24 \end{array}$$

3. The Facilitator should give the Learners several problems to solve in this way. The problems should NOT have carryover. It is best if these are story problems, such as :
 - If Fatima’s family had 34 goats and then sells 22 goats, how many will they have left?
 - Samir had 55 Afs. His brother borrowed 20 Afs. How many Afs does Samir have left?
 - The baker made 75 breads, and then he sold 61. How many breads does he have left?

The Learners should first work by themselves, and then work in groups to compare their answers and make corrections.

Milestone 1

Activity 16: Reviewing 2-Digit Subtraction WITH Carryover (Borrowing)

Objective: to review how to properly write and solve subtraction with borrowing, understanding the importance of specific problem-solving steps

Materials: board, large paper, a few stones

Activity:

1. The Facilitator should first give the Learners a sample problem and ask them how they would solve it. Example: If you have 85 Afs and you buy a book for 27 Afs, how much change will you receive?
2. The Learners should try to solve the problem themselves first working in group. After they have tried, or have solved the problem, the Facilitator should review the proper steps in solving a subtraction carry-over problem:

Steps in Solving a Subtraction Problem with Borrowing

- a. Write the problem properly, keeping the numbers in line. The larger number must be on the top.
- b. Starting with the ones place, in this case 7 is greater than 5 and so we can't subtract. So we borrow 10 from the 8 in the tens place and give it to the ones. The 8 becomes 7, and we add 10 to the 5 so it becomes 15.
- c. Now in the ones column, subtract 7 from 15. $15-7 = 8$.
- d. Now in the tens column subtract 2 from 7. $7-2=5$.
- e. The answer is 58.

$\begin{array}{r} 85 \\ - 27 \\ \hline \end{array}$
$\begin{array}{r} 7 \\ 8 \overset{1}{5} \\ - 27 \\ \hline \end{array}$
$\begin{array}{r} 7 \\ 8 \overset{1}{5} \\ - 27 \\ \hline 58 \end{array}$
$\begin{array}{r} 7 \\ 8 \overset{1}{5} \\ - 27 \\ \hline 58 \end{array}$

3. The Facilitator should give the Learners 2 more problems to practice and solve together like this. (Example: $65-17 = ?$, $73-26 = ?$)

3. For further practice in a game, the Learners can now play the Number Squares Game where they subtract the two numbers that the stones land on:
 In this case the player would have to subtract $71-25 = ?$
 Another player would then throw the stones and subtract another 2 numbers.
 Whichever player's answer is the LEAST is the winner.

25	49	90
•		
67	71	36
	•	
88	32	57

Milestone 1

Activity 17: Practice Adding and Subtracting 2 and 3-Digit Numbers with Carry-Over

Objective: to practice skills in solving problems

Materials: large paper, a few stones

Activity:

NOTE:

This is a more advanced version of the Numbers Squares Game which will involve both addition and subtraction. This can be played with teams.

1. Before playing the game, the Facilitator should show the Learners examples of 3-digit addition and 3-digit subtraction with carryover.

Examples:

$$\begin{array}{r} 467 \\ +258 \\ \hline \end{array} \qquad \begin{array}{r} 973 \\ -588 \\ \hline \end{array}$$

Important points to show the Learners:

- Watch carefully for the + or – sign!!
- Keep the numbers carefully lined up in their positions. If needed, write the problem in the lines on a notebook turned sideways.
- Always **start** adding or subtracting from the **right**, from the ones place.
- Continue the carry-over or borrowing to the left, to the next column as needed.
- Show how to work with 0 for borrowing or carrying over.

<p>EXAMPLES:</p> $\begin{array}{r} 705 \\ -263 \\ \hline \end{array}$	$\begin{array}{r} 658 \\ +578 \\ \hline \end{array}$
$\begin{array}{r} 705 \\ -263 \\ \hline 2 \end{array} \quad 5-3=2$	$\begin{array}{r} 1 \\ 658 \\ +578 \\ \hline 6 \end{array} \quad 8+8=16$
$\begin{array}{r} 6 \\ \cancel{7}^1 05 \\ -263 \\ \hline 42 \end{array} \quad \begin{array}{l} \text{Borrow from 7} \\ \text{Give to 0 to make} \\ 10 \end{array} \quad 10-6=4$	$\begin{array}{r} 1 \\ 658 \\ +578 \\ \hline 36 \end{array} \quad 1+5+7=13$

$\begin{array}{r} 6 \\ 7 \overset{1}{0} 5 \\ - 2 \ 6 \ 3 \\ \hline 4 \ 4 \ 2 \end{array} \quad 6-2=4$	$\begin{array}{r} 1 \\ 6 \ 5 \ 8 \\ + 5 \ 7 \ 8 \\ \hline 1 \ 2 \ 3 \ 6 \end{array} \quad 1+6+5=12$ <p>(continuing into the 1000's place)</p>
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Instructions for the Game

1. First the paper is prepared with 9 squares and numbers.
2. One team or player throws two stones. They must add the two numbers and write it down.
3. Now the other team or player throws the stones and adds the two numbers.
4. The team that had the highest answer wins – but how many points do they win? By subtracting the two answers, they will find the number of points that they win.
5. They must record these points.
6. At the end of the game, both teams add their points and whoever has the most points wins.

Example:

1. Team 1 adds 67+49. (67+49= 116)
2. Team 2 adds 25 + 32. (25+32=57)
3. Team 1 wins, since 116 is more than 57. To find how many points they win, subtract 116-57. 116-57 = 59 points to Team 1.
4. The game continues with Team 1 throwing stones again, and then Team 2, etc.

25	49	90
67	71	36
88	32	57

25	49	90
67	71	36
88	32	57

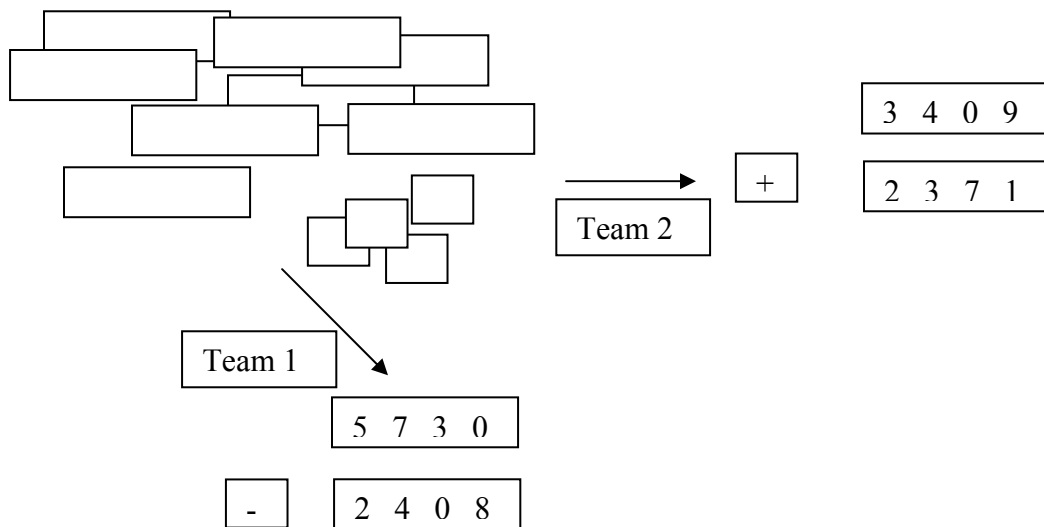
Milestone 1**Activity 18: Practice Game for Adding and Subtracting 4-Digit Numbers**

Objective: to extend the skills and steps for adding and subtracting to larger size numbers

Materials: about 15 cards prepared with 3 and 4-digit numbers, + and – symbol cards

Activity:

1. The number cards and symbol cards are laid upside down and mixed up on the table. Two teams (or two players) each take 2 number cards from the table, and one symbol card.
2. They turn their cards over quickly to show the 2 numbers and the sign that tells them if they should add or subtract the numbers.
3. They must arrange the cards properly and then in their notebooks solve the problem. They should race to finish their problem quickly. The team that finishes first wins – IF their answer is correct! Others should check the work of the teams to confirm the correctness of the answer.



4. The Learners should play this game several times to have lots of practice. They can also take 3 cards and 2 symbol cards to make longer problems such as 3449 + 7204 – 1591, etc.

Milestone 1

Activity 20: Using Large Numbers

Objective: to practice adding and subtracting large amounts of money

Materials: prepared word problems

Activity:

1. The Facilitator should write several word problems involving adding and subtracting money in the 1000's. The Learners should work in small groups to solve these problems.

EXAMPLES: [The Facilitator should write more sample questions.]

- If you have 5500 Afs and you buy some goats for 2300 Afs, how much money will you have left?
- If Zaher buys one carpet for 4750 Afs and another one for 3575 Afs, how much money will Zaher need?

EVALUATION ACTIVITIES FOR MILESTONE 1:

1. Read a 4-digit number out loud.
2. Listen to a 5-digit number and write it down.
3. Add a 4-digit number with carry-over.
4. Subtract a 4-digit number with borrowing.
5. Count an amount of money up to 10,000 Afs.

Evaluation Criteria: The Learners should complete these activities with 1 mistake or less per activity.

**MILESTONE 2:
2-DIGIT MULTIPLICATION WITH CARRY-OVER, 1-DIGIT DIVISION,
CALCULATIONS WITH TIME**

Milestone 2

Activity 1: Review of Multiplication Facts, games, and patterns of multiplication

Objective: to review the basic facts of multiplication

Materials: sets of number cards from 0 to 12

Activity:

Part 1

1. The Facilitator first needs to review the meaning of multiplication with the Learners. She can write an example on the board such as 3×4 and ask what it means – NOT what the answer is, but what it means to multiply. For example, 3×4 means $3+3+3+3$, or adding 3 four times. 7×5 means $7+7+7+7+7$. 10×3 means adding 10 three times, or $10 + 10 + 10$. So multiplication is like a special form of addition.
2. The Facilitator should ask the Learners a few multiplication questions to make sure they understand – such as, ask them what 5×6 means, and what the answer is.
3. Now the learners should find the empty multiplication table in their workbooks. The Ls must fill in the chart using the multiplication facts. (If they do not know how to use the chart, the Facilitator must show them first.)
4. NOTE: If the Learners do not know these multiplication facts, the Facilitator can show them how to calculate them using beans, etc as in Level 1 Milestone 4.

Multiplication Chart													
X	0	1	2	3	4	5	6	7	8	9	10	11	12
0													
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													

- The Learners may not know the facts for the 11's and the 12's. If not, the Facilitator can show them and they must fill in those rows on their chart as well.

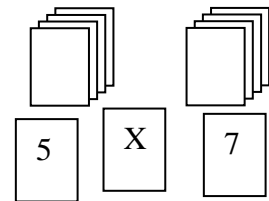
NOTE: This chart will be a reference for the Learners, in case they cannot quickly remember their multiplication facts.

Multiplication Chart - completed													
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

Part 2

Once the learners have completed their chart, they can form groups or pairs and play games to review and practice their memorization:

- Each group needs 2 sets of number cards (numbers from 0-12). Each set should be mixed up and placed upside down on the table so the numbers can't be seen.
- A multiplication sign (X) should be placed on the table as well.
- Two players each turn over a number card at the same time. They quickly place the cards beside the X to make a multiplication problem.
- They then compete to answer the problem. The person who says the correct answer first wins, and keeps the cards. If there is uncertainty about the answer, they should check the answer on the multiplication chart. They draw cards again and again quickly compete to say the answer first. They continue until all the cards have been used, then they count their cards to see who won.
- To make the game last longer, more cards can be added to each stack. This game can be repeated until the Learners are doing it very quickly. The cards should be mixed up before each new game.



Milestone 2**Activity 2: Review of Division Facts – perfect, and with remainders**

Objective: To review simple division and the concept of remainder

Materials: none

Activity:

1. The Facilitator should have a discussion with the Learners about the meaning of division: it means to share equally, to distribute. For example, if I have 30 cookies to share with 5 friends, I will give 6 cookies to each of them.
2. But, if I have 32 cookies to share with friends, I will still give each person 6 cookies, but I will have 2 cookies left over. This is called a remainder.
3. The Facilitator should ask the Learners how multiplication and division are related. They are very closely related: Division is the opposite of multiplication. This is clear because $5 \times 6 = 30$, and $30 \div 5 = 6$. We can understand division by understanding multiplication.
4. The Learners should be given a list of about 10 division problems and they must solve them either using their memories, or using the multiplication chart if needed. (Sample questions: $72 \div 9$, $64 \div 8$, $48 \div 6$, $35 \div 7$, etc.)

NOTE: To use the multiplication chart, for example to solve $72 \div 9$, first start at 9 on the top of the chart. Move down the 9 column until the number 72 is reached. Now follow that row to the side to the answer: 8.

5. These were all perfectly divided. $72 \div 9$ is exactly 8, with nothing left over. Now ask the Learners, what about $73 \div 9$? Is there an answer? Since 73 is a little more than 72, and $72 \div 9 = 8$, the answer is 8 and some left over (remainder), or a little more than 8.
How much is left over? $73 \div 9 = 8$ and 1 remainder. Since $9 \times 8 = 72$, subtract 72 from 73 to find the remainder: $73 - 72 = 1$ remainder.
6. One more example should be shown, showing how to determine the remainder.
Example: $48 \div 9 = ?$ Since $9 \times 5 = 45$ is closest to 48, then $48 \div 9 = 5$ with a remainder. The remainder is found from $48 - 45 = 3$. So $48 \div 9 = 5$ and 3 remainder.
7. The Facilitator should give the Learners problems to solve to determine the remainders of small division problems. Sample problems: $35 \div 8 = ?$, $57 \div 7 = ?$, $24 \div 3 = ?$, $19 \div 6 = ?$, $65 \div 8 = ?$, $52 \div 5 = ?$ Etc.

Milestone 2**Activity 3: Multiplying by 10**

Objective: to understand the rule and shortcut when multiplying by 10

Materials: board or flipchart paper

Activity:**X 10**

1. The Facilitator asks the Learners a series of problems: What is 5×10 ? 11×10 ? 2×10 ? 8×10 ? 12×10 ? She writes these problems on the board, and the Learners should give these answers, which are also then written on the board.
2. With each answer, the Facilitator should underline the 0. Example:
 $5 \times 10 = 5\underline{0}$
 $11 \times 10 = 11\underline{0}$
 $2 \times 10 = 2\underline{0}$
 $8 \times 10 = 8\underline{0}$ etc.
3. She should then ask the Learners what they notice, what pattern they see. Hopefully they will notice the 0 added to each number. The Facilitator and Learners should state the rule that when a number is multiplied by 10, we add a 0 at the end.
4. Why? For example, in the problem 8×10 , 8 is in the ones place. If we take 8 ten times, it becomes 80. In other words, when we multiply it by 10 it becomes 80. We know this is 8 tens, and the 8 has shifted to the tens place. This is the purpose of the added zero: to shift the numbers one place.
5. This rule applies to any number multiplied by 10: $25 \times 10 = 25\underline{0}$. $36 \times 10 = 36\underline{0}$. $497 \times 10 = 497\underline{0}$.
6. The Facilitator should give some more examples to the Learners to make sure they understand, and then ask them what 70×10 would be? Or 400×10 ?

X multiples of 10

7. The Facilitator asks the Learners to figure out a quick way to solve the problem 50×7 , using the rule for 10. The Learners should work with a small group to figure out a rule or short-cut.
8. The Facilitator should then confirm the rule: that 50×7 is the same as $5 \times 7 \times 10$. Since $5 \times 7 = 35$, then $35 \times 10 = 350$. This works because 50 is 5×10 . In other words, multiply the digits first (like 5×7) and then add a 0 to that number. EXAMPLE: $20 \times 7 \rightarrow$ First multiply the numbers $2 \times 7 = 14$. Now add a 0: 140. SO $20 \times 7 = 140$.
9. She should give them a number of other sample problems to solve such as 40×8 , 60×3 , 70×7 , 9×20 , 4×30 , etc.

Milestone 2

Activity 4: Multiplying by 100 and Multiples of 100

Objective: to extend the x10 rule to multiplying x 100

Materials: 100's and 1's number cards

Activity:

1. Once the Learners understand the rule for multiplying by 10, the Facilitator should then ask the Learners to solve a question: What is the rule for multiplying by **100**? Example: What is 7×100 ? Or 12×100 ?
2. The Facilitator should **not** tell the Learners the answer! She should leave them to figure it out by using what they have learned about the rule for multiplying by 10, and applying it here for 100. Once they know the rule, they should present it and explain it to the Facilitator. She should then check their understanding by asking them questions such as $8 \times 100 = ?$ $75 \times 100 = ?$ $322 \times 100 = ?$
3. She can then ask them to figure out how to solve problems such as $400 \times 7 = ?$, $800 \times 3 = ?$, $4 \times 400 = ?$ They should use the same method as when they learned 50×7 , but here instead of adding one 0, they will add two 0's: $600 \times 3 = 1800$ ($400 \times 7 = 2800$, $800 \times 3 = 2400$, etc)
4. The Learners can then practice by using the 100's cards and the 1's cards to generate random problems, drawing cards and writing down the problems in their notebooks and solving.

Milestone 2

Activity 5: One-Digit Multiplication Without Carryover

Objective: to learn the correct way to solve 1 digit multiplication

Materials: several digit cards of 1,2, 3; number cards: 12, 14, 13, 21, 22, 23, 11, 10, 20, multiplication symbol card X

Activity

1. The Facilitator should demonstrate how to solve a multiplication properly by writing it vertically and then first multiplying the ones, and then the tens:

EXAMPLE:
$$\begin{array}{r} 43 \\ \times 2 \\ \hline 86 \end{array}$$
 First, multiply $3 \times 2 = 6$ and write below.
Then multiply $4 \times 2 = 8$ and write below.

The Facilitator must make sure the Learners write the problem properly, with the ones lined up.

2. To practice, the Learners then put the digit cards (1,2, and 3) upside down in one stack and the number cards (23, 31, etc) upside down in another stack. The multiplication symbol X is placed as shown.

X

2 3

2
3. They take one number card and one digit card, turn them over, and form a vertical multiplication problem with the cards →
4. They copy the problem in their notebooks, and solve the problem.
5. Learners working in groups or pairs should work separately and then compare and check their answers with each other.
6. This can also be done as a competition game, trying to solve the problem as fast as possible.
7. After the problem is solved, the cards are removed and another 2 cards are drawn from the stacks. (the multiplier digits 1,2,or 3 will have to be reused several times.)
8. Learners should do at least 10 problems in this way to practice and review their multiplication skills.

Milestone 2

Activity 6: One -Digit Multiplication With Carry-Over

Objective: to learn the methods used in problems with carry-over

Materials: digit cards from 1- 9, variety of 2-digit number cards such as 25, 72, 47, 39, 44, 86, etc, multiplication symbol card X, multiplication charts

Activity

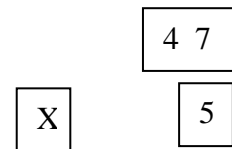
1. First, the Facilitator shows the steps in solving a multiplication problems that have carryover, demonstrating a sample problem such as 54×7 . The Facilitator should carefully show the steps in solving a problem. The Facilitator should again stress the correct alignment of the numbers by having the Learners write the problem in their notebooks sideways, in the lines.

Steps in Solving a Problem With Carry-Over

$\begin{array}{r} ^254 \\ \times 7 \\ \hline 8 \end{array}$	<ol style="list-style-type: none"> 1. Multiplying the ones numbers, $4 \times 7 = 28$. Since this is more than 9, we must carry over. $28 = 2$ tens and 8 ones 2. We will carry over the tens number, the 2, and write the ones number below: the 8.
$\begin{array}{r} ^254 \\ \times 7 \\ \hline 378 \end{array}$	<ol style="list-style-type: none"> 3. Now we multiply the tens number: $5 \times 7 = 35$. And we add the 2 tens we carried over: $35 + 2 = 37$ 4. We write the 3 and 7 in the next two khanes for the answer 378.

NOTE: Solving these problems requires knowing all the multiplication facts, so the Learners should have their multiplication charts ready to use.

2. To practice with 1-digit multipliers, the Learners put the 1-digit cards upside down in one stack and the number cards (25, 72, etc) upside down in another stack, as in the earlier activity.
3. They take one number card and one digit card, turn them over, and form a vertical multiplication problem with the cards →
4. They copy the problem in their notebooks, and solve the problem. **If necessary, the Learners can use their multiplication charts if they don't remember their multiplication facts quickly.
5. Learners working in groups or pairs should work separately and then compare and check their answers with each other.
6. This can also be done as a game, trying to solve the problem as fast as possible.
7. After the problem is solved, the cards are removed and another 2 cards are drawn from the stacks.



8. This should be done several times to give the Learners practice with a variety of numbers.

NOTE: This activity should be repeated for 2-3 days so that the Learners have enough practice with learning and understanding the steps.

Milestone 2

Activity 7: Practice with Multiplication with Carry-Over – Story Problems

Objective: to gain more experience in applying multiplication

Materials: story problems written on separate pieces of paper

Activity

1. The Facilitator gives the Learners the prepared story problem papers.
2. The Facilitator should work one sample problem with the Learners, showing how to set up the problem and then solve it.
3. The Learners work in groups or pairs to solve the problem, and check their work with each other.

Sample Story Problems to be written on separate pieces of paper:

- There are 8 girls with 25 Afs each. How much money do they have total?
- One piece of bread in Kabul costs 6 Afs. If a family needs 14 pieces of bread for dinner, how much will it cost?
- If a family has to pay 84 Afs for bread each meal, how much money will they need for 3 days of bread?
- Zahra prays 5 times every day. How many times will she have prayed every month, after 28 days?
- Fahima is sick. The doctor told her to take 3 tablets every day for 21 days. How many tablets will she have to buy?
- Fahim sells potatoes in Kabul. One kilo of potato costs 16 Afs. How much will 5 kilos cost?
- Afsoon needs 5 meters of fabric to make a dress. The fabric she likes costs 75 Afs for each meter. How much will the fabric for her dress cost?

Milestone 2

Activity 8: Two-Digit Multiplication

Objective: to learn the correct steps in multiplying 2-digit numbers

Materials: piece of paper, 2 small stones

Activity

- The Facilitator should review and show the Learners how to solve a 2-digit multiplication problem such as $45 \times 27 = ?$
This should be done by writing the problem vertically and showing each step involved:

$\begin{array}{r} 45 \\ \times 27 \\ \hline \end{array}$	<ol style="list-style-type: none"> Write the problem neatly with the numbers carefully lined up. Remember that 45×27 means 45×7 and 45×20, so the problem has 2 stages:
$\begin{array}{r} 3 \\ 45 \\ \times 27 \\ \hline 315 \end{array}$	<p>Step 1: 45×7</p> <ol style="list-style-type: none"> Starting with the ones, multiply $5 \times 7 = 35$. $35 = 30$ and 5. Write the 5 in the ones place and carry the 3 above the 4. Multiply 4×7 and add the 3 carried over: $4 \times 7 = 28$, $+3 = 31$. Write the 1 and then the 3 in the correct columns.
$\begin{array}{r} 45 \\ \times 27 \\ \hline 315 \\ 0 \end{array}$	<p>Step 2: 45×20</p> <ol style="list-style-type: none"> This step is 45×20, which means we must first add a 0 according to the rule. This is written underneath in the one's column.
$\begin{array}{r} 1 \\ 45 \\ \times 27 \\ \hline 315 \\ 00 \end{array}$	<ol style="list-style-type: none"> Now we continue multiplying by the 2 in the tens place: $5 \times 2 = 10$, write the 0 in the next space below and carry the 1.
$\begin{array}{r} 1 \\ 45 \\ \times 27 \\ \hline 315 \\ 900 \\ \hline 1215 \end{array}$	<ol style="list-style-type: none"> Multiply the 4×2 and add the 1 carried over: $4 \times 2 = 8$, $+1 = 9$. Write the 9 in the next space. (the 100's khane) The last step is to add the two lines, starting with the one's: $5+0=5$, $1+0=1$, $3+9=12$.

- The Facilitator should do one or two more sample problems with the Learners.

They can then play the Flat Dice game to practice:

5. On a piece of paper, the Learners make a box with 9 squares in it. They write a different 2-digit number in each box →
6. Taking two small stones, one player tosses the stones on the paper. She must then multiply the two numbers that the stones land in.
7. The next player then tosses the stones and multiplies her numbers. The winner can be the person with the highest number, Or the players can keep playing and adding their numbers until at the end, the person with the highest number wins.
8. This can also be played for speed, with one person tossing the stones and two people or two teams competing to finish the problem first. The teams must check each other's work for correctness and neatness as well.

15	49	22
34	25	37
67	82	53

NOTE: This lesson with 2-Digit Multiplication should be repeated once or twice (two more classes) to make sure the Learners are comfortable with this kind of problem.

Milestone 2

Activity 9: Review Of 1-Digit Divisor Problems, With And Without Remainder

Objective: to review the concepts of division

Materials: digit cards of 2, 4, 3-digit number cards such as 328, etc,

Activity

1. First, the Facilitator reviews how to solve long division problems with no remainder. A sample problem could be “The Women’s Group made 835 Afs by selling their vegetables. There were 5 women in the group. How much will each woman receive?”
2. She should clearly demonstrate the steps in solving the problem. She should stress the need for knowing multiplication in order to solve division, and the importance of writing problems properly.
3. She can do additional sample problems such as: $328 \div 2 = ?$, $635 \div 5 = ?$, $464 \div 4 = ?$
4. The Learners should practice solving more sample problems given by the Facilitator, and then compare their work with other Learners. The problems should also include word problems such as dividing money among friends or dividing animals or expenses, etc.

SAMPLE PROBLEMS: These must be without carryover at this point.

$625 \div 5 = ?$, $458 \div 2 = ?$, $954 \div 3 = ?$, $714 \div 7 = ?$,

These can also be made into story problems, such as:

- There were 5 women who wanted to buy a new health book to share . The book cost 625 Afs. How much will each woman have to give so they can buy the book together?

5. The Facilitator can also show the Learners how to check their work by multiplying. For example:

$625 \div 5 = ?$. The answer is 125.

To check, multiply 125×5 and make sure the answer is 625 : the original problem.

Milestone 2

Activity 10: One-Digit Division With Remainder – Story Problems

Objective: to provide practice with applying division

Materials: notebooks, prepared story problems written on pieces of paper

Activity:

1. After the Learners have practiced, they should then continue on to solving division problems **with** a remainder. Most division is NOT perfect and has remainder.
 - The Facilitator should show a sample problem, for example: The government gave 325 books to the village. The village wanted to divide the books between the 3 local schools. How many will each school get, and how many will be left over?
2. The Facilitator should give additional story problems for the Learners to solve together.

Sample Story Problems:

- A group of 6 friends rented a taxi to drive to the city. The cost was 550 Afs. How much will each person have to pay, and how much will be left?
 - Rahima has 255 Afs to buy shoes for her children. She has 4 children. What is the most she can pay for each pair of shoes if they all cost the same? How much money will she have left over?
 - The school bought 820 pencils. The school has 7 classrooms. How many pencils will be given to each classroom?
 - When Wahida's daughter Fatima was young, she was sick and weak. The CHW gave vitamins for Fatima. The CHW gave Wahida 125 vitamins, and told her to take 3 tablets every day. For how many days will she have enough iron tablets?
3. The Learners can then also make up some of their own problems, thinking about examples in life when division is needed.

Milestone 2

Activity 11: Conversion Of Seconds Into Minutes And Vice Versa By Using Multiplication And Division

Objective: to introduce hour, minute, second and how to use them in real life. And also converting them from one form to another.

Material: watch

Activity:

1. The learners should be asked what does ‘second’ mean?, and how many seconds are in a minute?
2. The Facilitator should start such discussion that encourages the learners to think about time measurement: For example:
 - What can you do in 1 minute?
 - What can you do in 5 minutes?
 - Can you read one sentence in 1 minute?
 - How long does it take to cook rice for your family?
 - How many minutes it takes to go from your house to leaning center?

They may say that they can go from their home to their learning center in 5 minutes, and then the Facilitator should ask: How many seconds are in 5 minutes?

5 minutes equals seconds

10 minutes equals seconds

You can convert different quantities of seconds into minute and vice versa

Examples:

- How many minutes are equal to 220 seconds? 220 sec = seconds
- How many minutes are equal to 240 seconds? 240 sec = seconds
- How many minutes are equal to 90 seconds? 90 sec = seconds

Note: You should encourage the learners to work on converting minutes to seconds and seconds to minute by using multiplication and division.

At first the learners should know that 1 minute is equal to 60 seconds, and then help them learn how to convert minutes to seconds and vice versa.

The Facilitator should say to the learners, you have already learned that 1 minute equals to 60 seconds, now answer the following questions.

- How many seconds are in 7 minutes?(10 min x 60 sec = 600 sec)
- How many seconds equal 10 minutes?
- How many seconds are equal to 15 minutes?

Milestone 2

Activity 12: Conversion of Hours into Minutes

Objective: Recognizing watch and hours, and also time management.

Material: Watch / clock

Activity:

1. The learners should be asked if they know that 1 minute equals 60 seconds. If not, then the Facilitator should explain it in detail. Then, the Facilitator should divide the class into 4 groups, and each group should be given a specific duty.
 - Group I : draw a clock and write numbers on it
 - Group II: how many minutes are in 3 hours?
 - Group III: how many hours are between 9:00 am and 9:00 pm?
 - Group IV: convert 180 minutes into hours

$$\begin{array}{r|l} 180 & 60 \\ 180 & \hline & 3 \text{ hours} \end{array}$$

2. The Facilitator should encourage the learners to think and make discussions, by asking some questions as following:

- How many hours are in a day?
- How many hours do you use for praying?
- How many hours do you use for cleaning?
- How many hours do you use for cooking?
- How many hours do you use for tailoring?
- How many hours you should you take with your children to feed them and teach them well daily?
- How many hours you should have for visiting your relatives?
- How many hours you should have for relaxing/ fun?

Show all your daily responsibilities and time you spend on each activity by pictures.

3. Then, the Facilitator should give a few questions to each group and they should write them into their notebook:

Examples:

- 1st group: how many minutes are equal to 3 hour? 3h = () min
- 2nd group: how many minutes are equal to 6 hours? 6h = () min

- 3rd group: how many hours is the circle of round the clock?
Day and night = () h
- 4th group: how many minutes is the circle of round the clock?
Day and night = () min

Notes: Before any discussion, the Facilitator should give the prepared text card to the learners. The cards should have a text relating to the learners activity such as:

- What would you do if you have 2 hours free time? Would you help anybody? And etc.

Milestone 2

Activity 13: How Days Become Nights

Objective: to become able to understand the rotation of earth around the axis, and relation of day and night with the earth rotations. And also understand how many hours are in a cycle of night & day.

Material: globe

Activity:

1. The Facilitator should remind the learners about how many seconds are equal to 1 minute, and how many minutes are equal to 1 hour. Then, she explains how the cycle of day and nights created, and how many hours the cycle lasts.

The Facilitator should show the globe and explains that the earth has two types of movements. The movement of the earth around its axis creates the cycle of day and night, and the movement of the earth around the sun creates the cycle of one year.

2. Movements of the earth around the sun create seasons, months, and yearly cycle.
3. The Facilitator should select two learners, one should be named sun and the other should be named earth. An oval shape line should be drawn around the sun-named-learner. The earth-named-learner should move along the oval line while rotating around herself too. Then, the Facilitator point to the earth-named-learner and explains, days and nights created while the earth is rotating around her self. And the season, month and year is created while the earth is moving around the sun.

Milestone 2**Activity 14: To Recognize Days, Months, and Seasons**

Objective: to understand about week month and year, and to find how many days and weeks exist in a year.

Material: notebook, pen and flipchart

Activity:

The learners should be asked if anyone of their family is out of the city. Some of them may say:

- It is 6 months that my husband is out of the city.
- It is about 1 month that my uncle has gone abroad.
- It is 1 month since my mother has gone to Mazar-sharif.
- It is 2 months since my brother has gone to Herat.

The Facilitator should listen to the learners and write whatever she hears from learners on the class-board. Then, she divides the class into 4 groups and each group should perform a specific duty.

- 1st group: 30 days x 6 months = () days
- 2nd group: 30 days x 3 months = () days
- 3rd group: 30 days x 1 month = () days
- 4th group: 30 days x 2 months = () days

Then, the Facilitator should ask how many months are in a year? Perhaps, learners respond, 12 months.

Exercise:

- 1st group: how many weeks are in 6 months? $4 \times 6 = ?$
- 2nd group: how many weeks are in 3 months? $4 \times 3 = ?$
- 3rd group: how many weeks are in 1 month? $4 \times 1 = ?$
- 4th group: how many weeks are in 2 month? $4 \times 2 = ?$

When the learners find the answers then read them outloud for the class and the Facilitator should write them on the class-board.

The Facilitator along with the learners should start counting days of a year. They would end to 365 days. Then, she should ask, how many days are in a year?

In order to help the learners to understand the combination of days, weeks, months, and year, the Facilitator should give more exercises as following:

- How many months are in a year?
- How many weeks are in a year?
- How many days are in a year?
- How many seasons are in a year?

EVALUATION ACTIVITIES FOR MILESTONE 2

The Learner should be given two word problems to solve involving multiplication and division and time, such as:

1. Alima's baby was born 18 weeks ago. How many days old is the baby?
2. When Hafiza became pregnant, she became anemic. The CHW gave Hafiza 126 iron tablets, and told her to take 3 tablets every day. For how many days will she have enough iron tablets?
3. Which is more time: 3 minutes or 100 seconds?

Criteria: These problems should be solved with 2 or less mistakes each.

Answers:

1. $18 \text{ weeks} \times 7 \text{ days in one week} = 126 \text{ days}$
2. $126 \div 3 = 42 \text{ days}$
3. $3 \text{ minutes} \times 60 = 180 \text{ seconds}$, so 3 minutes is more time than 100 seconds, since 180 seconds is more than 100 seconds.

**MILESTONE 3:
AN INTRODUCTION TO DIFFERENT TYPES OF FRACTIONS**

Milestone 3**Activity 1: An Introduction to Fractions**

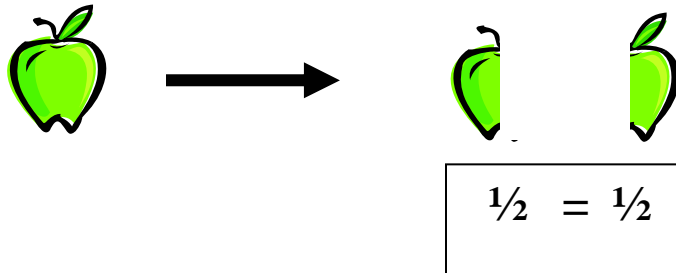
Objective: Make the fractions clear to the learners by presenting practical examples. The goal of this activity is that the learners exercise skills of dividing something into equal pieces.

Materials: an apple, a knife, a sheet of paper, marker and white board

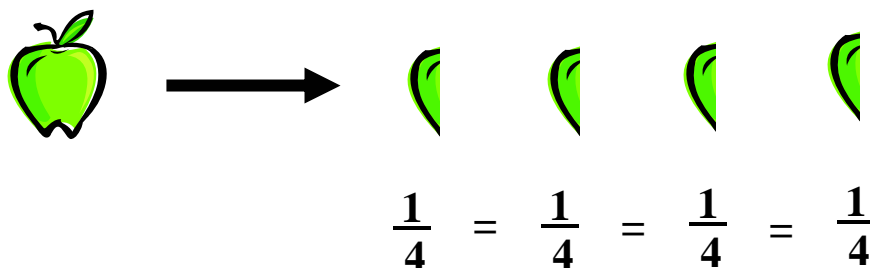
Time: 45 min

Activity:

1. At first, show a complete apple to the learners and then divide it into two equal parts as shown in the picture.



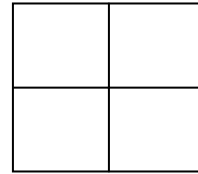
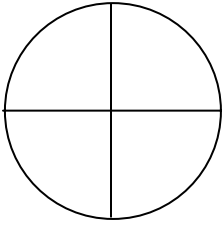
2. The apple that you have divided it into two equal parts, again divide each part into two parts as shown in the picture.



3. Ask the learners:
 - How many pieces did you divide the apple into the first time?
4. Now, draw a complete apple on the white board and divide it into two parts, write $\frac{1}{2}$ under each part. As we divided a whole unit into two equal parts, so each half is shown as $\frac{1}{2}$ in math.
5. Ask the learners: The second time, into how many pieces did we divide the apple? The second time, we sliced each part of the apple into four equal pieces.

We divided the first apple into four equal parts, so each of the four halves is written as $\frac{1}{4}$. Again, draw an apple on the board with a marker and divide it into four parts, write $\frac{1}{4}$ under each part.

5. Ask the learners to draw a square, rectangle or a circle on a sheet of paper.



Ask the learners to divide each shape into four parts, when they are finished, tell them to shade the half part of the circle, three parts of the square and a part of the rectangle and scissor the shaded parts and place it in their notebooks.

Now, ask the learners:

1. Firstly, to how many parts did you divide each shape?
2. How many parts did you cut and take away?

When you have listened to their answers, add: at first we divided some whole units to many parts and then we took a few parts from each full unit. We showed fractions.

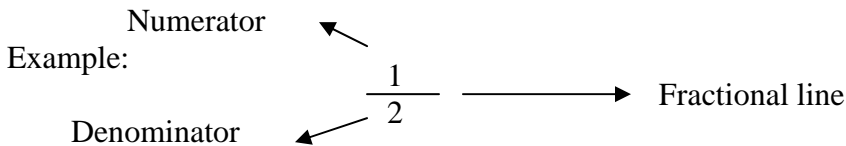
So in mathematics, dividing a full unit into few parts and taking one or some parts away is called **fraction**.

Note: If necessary, explain the literal meaning of the word ‘fraction’ by showing a piece of wood as an example. Repeat the above-mentioned fractional digits on the board and write the related digits under each shape.

A: explain to the learners that the number that is written under the line is called Denominator and it shows that a whole unit is divided into few equal parts.

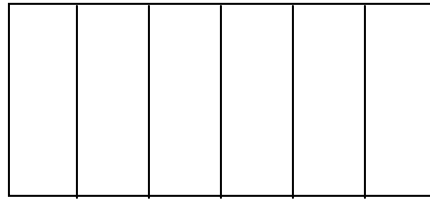
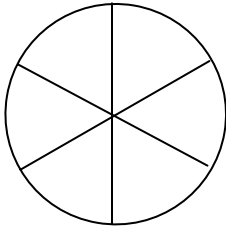
B: Explain to the learners that the number which is written above the line is called Numerator

The Denominator shows that from few or a whole unit, one or more parts are taken.



6. In order to conceptualize the Fractional line, numerator and denominator, ask the learners to draw a square, a rectangle and a circle, then they should divide the shapes the

circle into eight parts, the square into four parts and the rectangle into six parts and shade one part from each shape, then they should write down the fractional figures under each shape.



Milestone 3

Activity 2: Equal Fractions

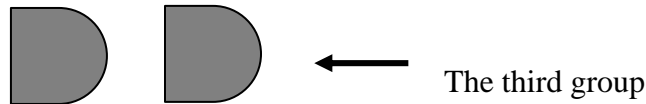
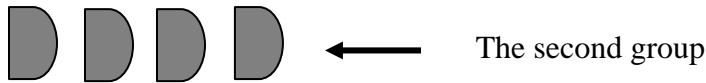
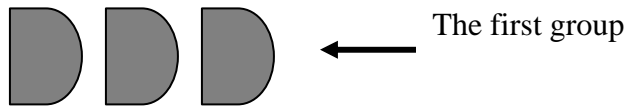
Objective: The learners should understand that fraction means not merely dividing a unit into equal parts, but taking one or more parts from a whole unit is the important point in fraction. During this activity the learners will be familiar with a kind of fraction called equal fractions.

Materials: sheets of paper, an apple with a knife for each group

Time: 45 min

Activity:

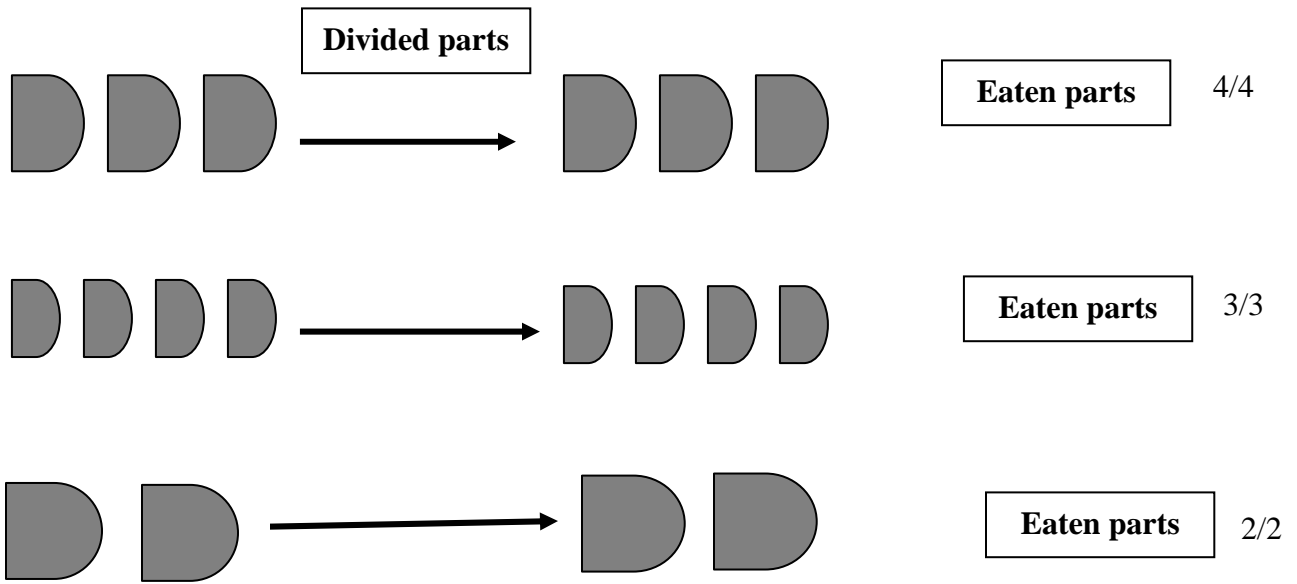
1. Arrange the learners into three separate groups; distribute an apple and a knife to each group.
2. Ask the groups to divide the apple in sequence, the first group into 3 parts, the second into 4 parts and the third into 2 equal parts, as seen in seen in the picture below:



3. Now tell the learners to eat the whole parts of the apple or give it to others.
4. Ask each group:
 - Have some parts remained from the first apple I give you?

They say no! We have eaten all parts.
5. Now say that:

As you divided your apples into two or more parts and you ate all the equal parts, so no parts have been remained with you.
6. Ask the learners to pay attention to given picture.



7. Ask them what have they learnt from the picture above, encourage them to express what their conception is about the subject.

Now we see that the numerator of the first second and the third fraction are the same. (The very parts have been taken which the unit is divided to).

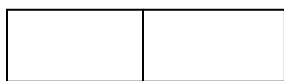
So: such fraction which their numerator and denominator are the same figure, are called equal fractions.

8. For more exercise, ask the learners to draw three circles on their papers, the first group should divide the circle into three equal parts, the second group into two parts and the third part into one part then ask the learners to shade the circle completely and write the related fractional figure under it.

9. Listen to the learners and their suggestions and analysis.

10. Repeat it once again.

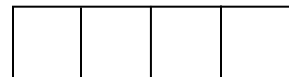
Those fractions are called equal fractions when their numerators and denominators are the same number. In other words, they are equal to the number 1.



$2/2$



$3/3$



$4/4$

Milestone 3

Activity 3: Becoming Familiar With Fractions and Writing the Fractional Figures Correctly

Objective: getting familiar with geometrical shapes, drawing geometrical shapes as well as dividing a unit to some equal parts and taking some parts from it.

Materials: geometrical shapes such as circle, rectangle and square made of paper

Time: 45 Min

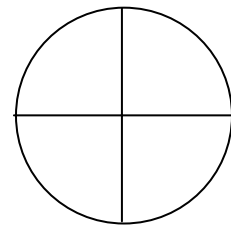
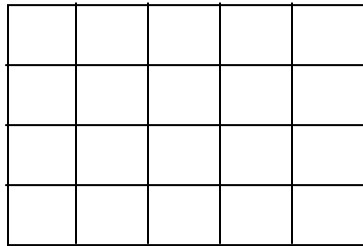
Activity:

1. For more exercise, distribute papers to the learners on which these fractions are written: $\frac{1}{20}$, $\frac{1}{9}$, $\frac{1}{4}$, $\frac{1}{10}$

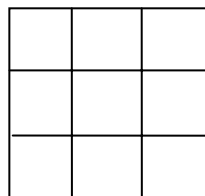
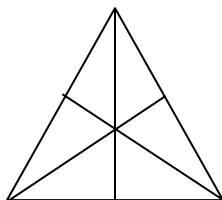
After that, to make the fraction understood well tell the learners to draw the following geometrical shapes in their notebooks.



2. Instruct the learners to read their papers and according to the fractional figures written on their cards and in accordance to that, they should divide the geometrical shapes as the following shapes:



3. Guide the learners to count those parts to which they divided the geometrical shapes then they should write the counted parts in the form of fractional figures, in their notebooks.
4. Hang a flip chart in the classroom on which geometrical shapes have been drawn, ask the learners to come to the flip chart one by one and divide the shapes into parts .
5. As an example, these shapes have been divided into equal parts:



Ask the learners to write its fractional questions of the shapes on the flip chart or in their notebooks.

Note: In order to conceptualize fraction much better to the learners, ask them to draw different geometrical shapes on papers and divide them into equal parts. After that, they should shade certain parts of it and should write down the fractional operation in their notebooks.

Milestone 3

Activity 4: Understanding Fractions in Food

Objective: explaining the fraction by cutting the watermelon into equal parts

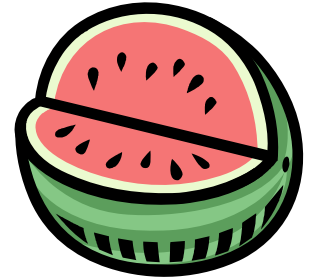
Materials: a pot for water

Activity:

Note: It should become clear to the learners that cutting a watermelon into equal parts and serving one, more or all parts is called fraction.

1. Arrange the learners into specified groups. Start cutting the watermelon into equal parts while all the learners are present and are able to take part.

Cut the watermelon into two parts and explain to the learners that a whole unit (watermelon) has been into two parts. Ask them to write $\frac{1}{2}$ in their notebooks (they know the reason themselves).



Ask the learners to continue cutting the watermelon into equal parts, as shown in the picture and they should write the fractional figures too like these: $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{12}$, $\frac{2}{8}$ and so on.

2. You can explain more examples of fraction in food, e.g. you have a bag of 50kg floor, if you share it into 28 parts and you take three parts, how do you write the operation?

- If within 10 days you spent ten parts of it, then how do you write the operation?

3. Show some examples of fraction in liquids, ask the learners the following: if you have a flask in which there are four liters of water, you spend one liter per day, then how do you write the fractional operation? (Look at the picture, it may help you).

The picture shows a flask having 4 L of water. Each part of the flask represents 1 L of water.



- First day
- Second day
- Third day
- Fourth day

Note: you facilitator should explain the method of cutting, taking, eating or granting of one or more parts of something to the learners clearly. The aim of the fraction of food is, to cut something into equal parts and taking (using) of some parts of the certain thing.

Milestone 3**Activity 5: Explaining Fractions with Liquids**

Objective: introducing fraction and making it familiar to the learners, using everyday liquids.

Materials: a jug, glasses, water

Activity:

1. Prepare a jug and 8 glasses as shown in the figure:
2. Pour the water of the jug into the glasses equally
3. Firstly, pour the water of one glass on the floor then ask the learners that how will the action be shown in fractional figures?
4. Secondly, pour two glasses of water on the floor and ask the learners that how is the written form of this operation in math?
5. The third time. Pour three glasses of water on the floor and ask the learners how many glasses of water have been reduced from the jug? Ask them to show the operation in fractional figures. And continue it for the eight rounds and she (facilitator) should ask the learners to show the mathematical form of the operation.

The learners may say in turns: $\frac{4}{8}$, $\frac{5}{8}$, $\frac{6}{8}$, $\frac{7}{8}$, $\frac{8}{8}$. In the operation the learners should be understood that $\frac{8}{8}$ means equal fraction. The Numerator and Denominator equal to the number 1: $\frac{8}{8} = 1$.

You can perform fraction by breaking a tablet into parts, e.g. if we cut a tablet into four parts and we use one part from the four, we say we $\frac{1}{4}$ part has been used as well as if we use 2 parts, we can say $\frac{2}{4}$ parts have used and if three parts are taken we say $\frac{3}{4}$ parts have been used and at last if we use the whole parts we say that this is an equal fraction.

Note for facilitator: To make fractions understood to the learners in food, liquids as well as in tablets much more, you can make examples in this regard and ask the learners to express their views, ask them, how do they use fractions in daily life? (if they needed guide help them).



Milestone 3

Activity 6: Distinguishing and Practicing Fractions

Objective: In meantime the goal is to enhance the knowledge of the learners in writing of fractional figures and to prepare the ground for a competition.

Materials: a flipchart on which many geometrical shapes are drawn.

Activity:

1. Ask the learners to draw the shapes from the flipchart in their notebooks and then cut them. Also ask them to write their names in their notebooks.
2. Observe the learners in order to find out who finishes fastest; with this we can make a competition among the learners.
3. Ask the learners to take some parts off from a shape divided into parts and then they should shade it and write the fractional figures in their notebooks. When they are finished, ask everyone to come to the flip chart and should write the fractional figures to check which one does it better and sooner.
4. Ask the learners separately to discuss fractions and their creation in things and the surroundings.

Since fractions can be found in all aspects of life, we must explain it to the learners well. The facilitator should make fractions clear to the learners and present more examples of fraction in daily life.

Milestone 3

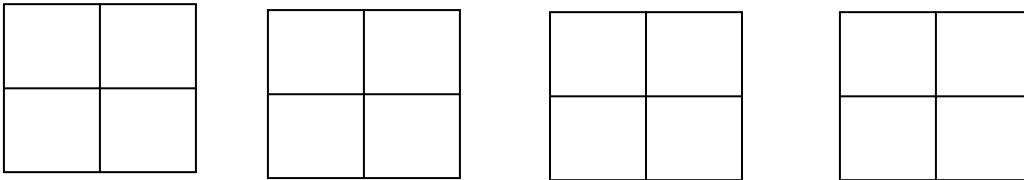
Activity 7: Proper & Improper Fractions

Objective: in order to make the learners familiar with kinds of fractions (Proper and Improper).

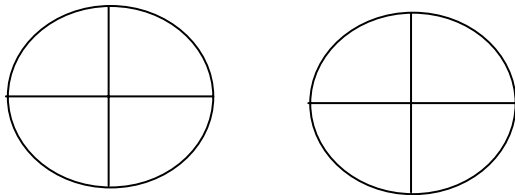
Materials: paper and a ruler

Activity:

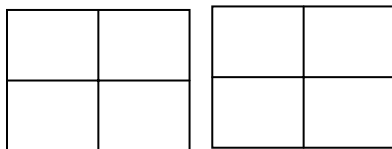
1. Hang a big chart in the classroom and ask the learners to draw a square on a paper and display some fractions like: $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, and $\frac{4}{4}$.



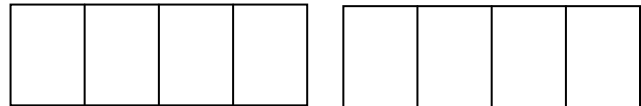
2. Ask the learners to display $\frac{6}{4}$ and $\frac{6}{5}$ also, using geometrical shapes, if you observe they have difficulty to display the second fractions, draw some samples on the flip chart as the following:



$\frac{5}{4}$



$\frac{5}{4}$



$\frac{8}{4}$

3. Arrange the shapes of both sets in a column as displayed in the picture, to say what are the differences between these sets?

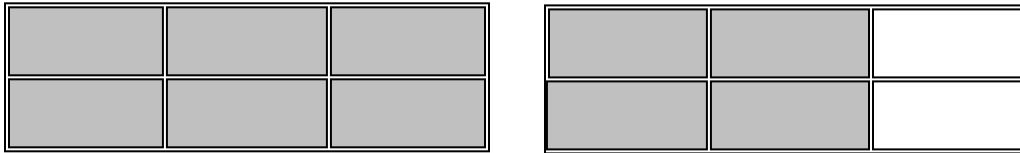
$\frac{5}{4}$, $\frac{6}{4}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{4}{3}$, $\frac{4}{4}$

4. After you have listened to their responses, ask the learners:
 - a. In which sample of fractions is the numerator is bigger than the denominator?
 - b. In which sample of fractions is the denominator is bigger than the numerator?

Confirming their suggestions, define the proper and improper fractions as the following:

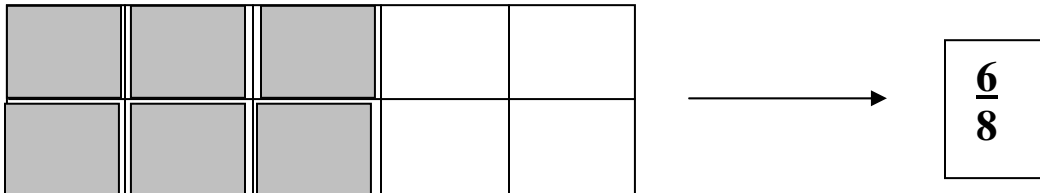
- The fractions that their numerator is smaller than their denominator are called proper fractions. (let the learners to have a look at the first figure)
- The fractions that their numerator is bigger than their denominator are called improper fractions. (let the learners to have a look at the second figure)

5. Ask the learners to draw two rectangles and divide them into equal parts as the following:



6. Ask the learners to display the following proper fractions using squares and rectangles. $7/8$ $5/8$ $2/8$ $4/8$ $6/8$

Example: using a geometrical shape, we display the proper fraction of $6/8$ as the following:



7. For more practice, write more examples of fractions (some with a bigger denominator than the numerator and some with a bigger numerator than the denominator) on the flip chart and ask the learners to distinguish proper and improper fractions from each other.

Milestone 3

Activity 8: Comparison of Fractions

Objective: in order to make the learners distinguish small and big fractions

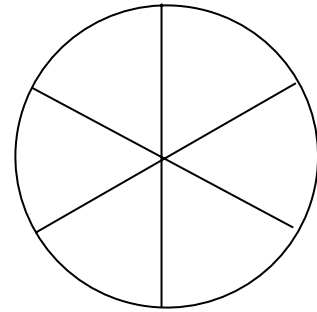
Materials: paper, a pencil, a ruler and a flip chart

Time: 45 min

Activity:

1. Drawing a shape on the flip chart, explain the example to the learners: Najib’s father cuts a cake into six parts, he distributes two parts to Najib and three parts for Hamid. Whose share is bigger?
2. Ask the learners to that first the cake was cut by into six parts and then using the shapes, they should display $\frac{2}{6}$ and $\frac{3}{6}$ as the following example:

Supposedly, the opposite circle is a cake; Najib’s father distributed two parts to him from the whole cake and three parts to Hamid, from the whole cake one part has been remained for him.

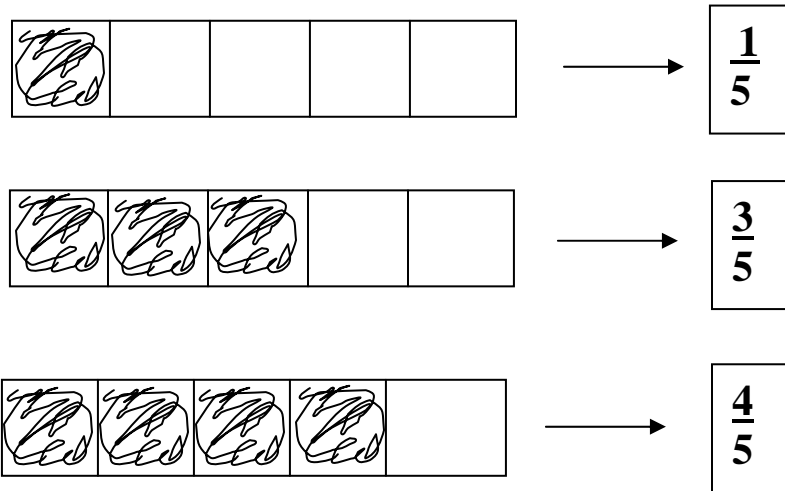


3. Ask the learners:
 - From your point of view, whose share is bigger? $\frac{4}{4} = \frac{2}{6} + \frac{4}{6}$
 - Do the denominator of these fractions differ from each other? Or are the same figures?

Surely, the learners will say that: Hamid’s share is bigger than Najib’s. Why? From the whole cake, he gave half part to Hamid and Najib’s share is less than the half part of the cake.

4. As the denominator of both fractions is the same, only the numerators differ from each other. So in these kinds of fractions:
5. That fraction is bigger that has a bigger numerator so, we can show the above figure in math as: $\frac{2}{6} < \frac{3}{6}$ (the facilitator should explain the signs $<$ and $>$ much more by giving examples to the learners.)
6. Write more examples of fraction on the board and ask the learners to compare them. $\frac{5}{10}$ $\frac{2}{10}$ and $\frac{3}{12}$ $\frac{6}{12}$

Ask the learners to draw three narrow rectangles as shown in the figure, secondly they should shade one part, three parts and four parts of the rectangles.



Now ask which one among the above fractions is the bigger, and which one is the smallest of the fractions? Ask the learners to arrange them from smallest to the biggest using the signs of $<$ and $>$.

Having worked out the above examples, now ask the learners:

- From your point of view if the numerator is made bigger, the fraction will become small or big?
- If the denominator is made bigger does the fraction gets small or big?

After you listen to the answers of the learners, summarize the above operation as the following:

A: If the numerator of the fraction is large, the fractional operation is big.

B: if the denominator of the fraction is large, the fractional operation is small.

Milestone 3**Activity 9: Comparison of Fractions with the Same Numerators but Different Denominators**

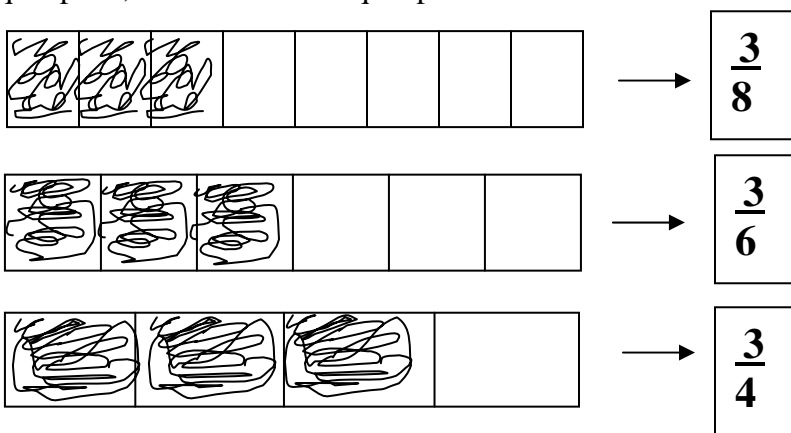
Objective: to make the learners able to compare the fractions which their numerators are the same figure but the denominators differ.

Materials: a sheet of paper with a pencil.

Time: 45 min

Activity:

1. Ask the learners to draw six rectangles by a ruler and orderly, divide the first one to 8 equal parts, the second to 6 equal parts and the third one into 4 equal parts.



2. Now ask the student to shade three parts of each rectangle then they should write the fractional operation.

3. Tell the learners that according to the shape, it is clear that:

$$\frac{3}{8} < \frac{3}{6} < \frac{3}{4}$$

So, among those fractions where the numerator is the same number but, the denominators are different, the biggest fraction is the fraction which has the smallest denominator.

4. Give more examples of the above-mentioned fractions to the learners to compare it with each other (to specify the biggest and the smallest).

Milestone 3

Activity 10: Becoming Familiar With Equivalent Fractions

Objective: understanding what equivalent fractions are and where such kind of fractions are found in their daily life.

Materials: two apples with a knife, a sheet of paper, pencil and a ruler

Activity:

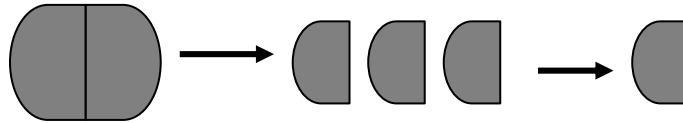
1. Ask the learners to listen to the question carefully and then answer:
 Nawid took two apples from the garden and he brought it home. He sliced one into three parts and he gave one part to his brother Asif. He sliced the second one into six parts and he gave two parts to his sister Amina.

2. Now, ask the learners that:

- Does Asif have more apple or his sister?
-

In order to make the question understood, show these shapes on the chart and ask the learners to pay attention to it.

One part of apple to Asif.



To parts to Amina



The above figure shows that Asif and Amina have the same quantity of apple. Why? Although the shapes are different, it shows the same amount and they are called equivalent to each other.

As: $4/8 = 2/4 = 1/2$

Note: The facilitator should work out many more examples of equivalent fractions for the learners.

EVALUATION ACTIVITY FOR MILESTONE 3**Activity:**

Work with the learners as in the following and ask them:

If you have a piece of agricultural land and you part it into 10 parts then you cultivate something in one part, how do you show it in mathematics?

1. From those ten parts, if you cultivate eggplant in two parts, how do you show it using a fraction?
2. If you cultivate pepper in three parts out of ten, how will you write it?
3. if you cultivate egg plant in four parts out of ten, how will you show the cultivated part in fractional figures?
4. A man distributed 30 trees out of a hundred to a son and 25 trees to another one, 20 trees to his brother and 25 trees to his daughter. How will you write the distributed trees in fractional figures?
5. If each pair of your cows produces one full bucket milk and each bucket holds 30L milk. You distribute the 30 Ls milk as the following:
 - If you give 10 Ls to a dealer, show the operation in fraction.
 - If you save 15 Ls in order to make yogurt, write the fractional operation.
 - if you distribute another 10 Ls to a dealer who you have contract with, then write the fractional operation.
 - If you use the rest 5 Ls for your breakfast, show it in fraction.

Note: Tell the learners:

Based on the understanding you have from fractions, tell how much milk the people above got from the whole 30Ls?

MILESTONE 4: PERCENTS

Description of Milestone:

The goal of this milestone is for the Learners to be able to understand the meaning of percent and information presented in percentage form. They will also learn how to interpret and analyze data in percent form.

Milestone 4

Activity 1: Review of Fractions and Circle Parts – Circle Charts with Fractions

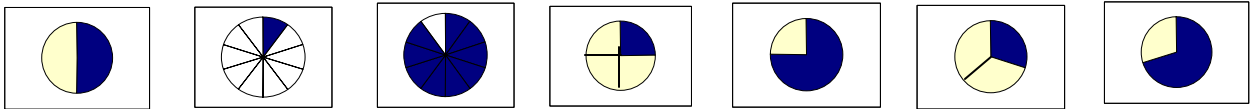
Objective: To review the fractional parts of a circle

Materials: math learner book, prepared circles, a glass and a pot of tea

Time: 1 class

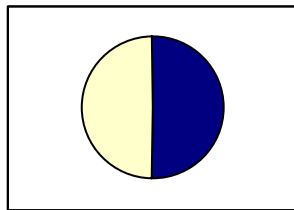
Activity

1. Draw the circles on the board, or make them out of paper, or the Learners should look in their workbook:

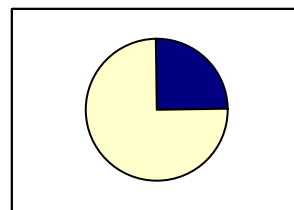


2. The Learners should identify the shaded part of each circle as a fraction and write it underneath.
3. Then for each circle, they should then pour tea into the glass until the amount of tea in the glass matches the 'amount' shaded in the circle. They should draw the glass and the tea under the circle.

Examples:




$\frac{1}{2}$

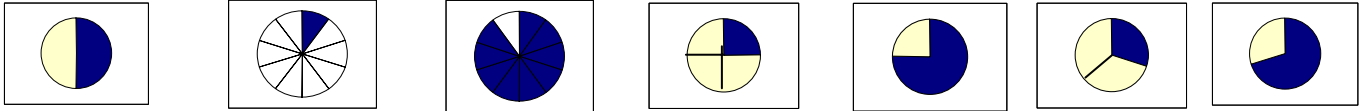


$\frac{1}{4}$

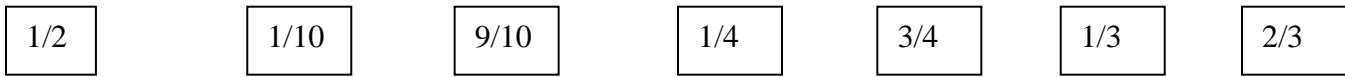


 **Workbook activity for Learners**

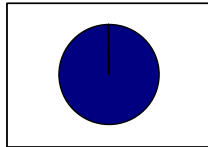
Circles – what fraction is shaded?



Answers for Facilitator:

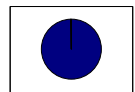


4. Once the Learners have identified the circles as fractions and have poured the cup of tea and drawn it so it matches each fraction, give the Learners one more circle to analyze:



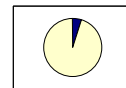
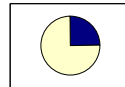
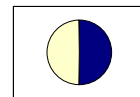
In this case, the shaded circle is 1, a whole. And the cup of tea should be completely full. This picture represents a full cup of tea, a complete whole.

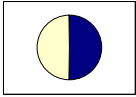
5. Give other examples of representing a whole with a complete circle. For example, a whole, uncut watermelon would be represented with this circle →



Ask the Learners, and let them answer and draw:

- How would half of a watermelon be shown with a circle?
- How would $\frac{1}{4}$ of a watermelon be shown?
- How would a small slice of a watermelon be shown?
- How would a large slice of a watermelon be shown?



6. For practice, give the Learners different circles and ask them to list examples of things that the circles could represent. For half-shaded circle could represent a half-bread, or a house that is half-built, or a half drunk.  For example, this eaten piece of cup of tea that is

The Learners should draw the circles and make a list of examples.

Milestone 4,

Activity 2: Information In A Visual Form

Objective: to be able to interpret simple representations of information in a circle

Materials: math learner book

Time: 1 class

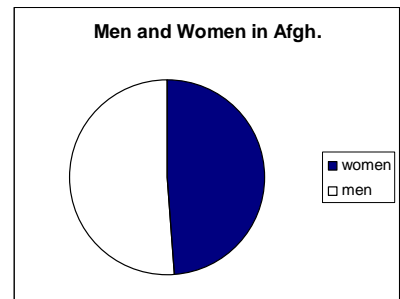
Activity

1. Draw the following circle on the board. Explain that the whole circle represents all the people in Afghanistan. The shaded part represents the number of women in Afghanistan and the unshaded part is the number of men. This is written in the small box on the right.



- Ask the Learners to describe what they see and explain what it means:

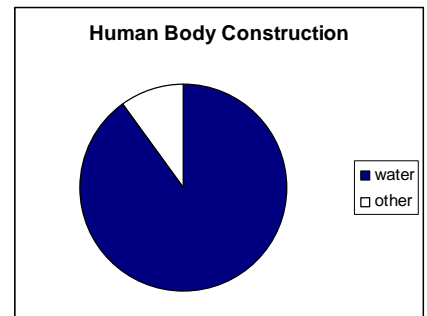
This circle shows that the number of women and men in Afghanistan is almost equal; Afghanistan is half women and half men.



2. Draw the circle on the board. Explain that the whole circle represents the human body. The shaded part represents the amount of the body that is made of water. The unshaded part represents the other parts of the body that are not water, such as teeth and hair, etc.

This is shown in the small box on the right side of the drawing.

- What does this circle tell us about the body? What is our body mostly made of?

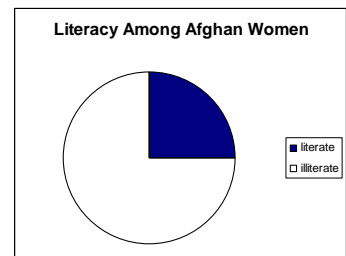
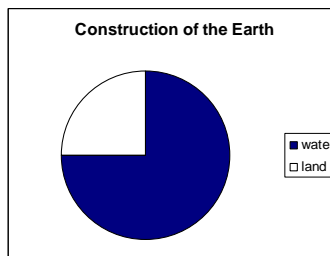
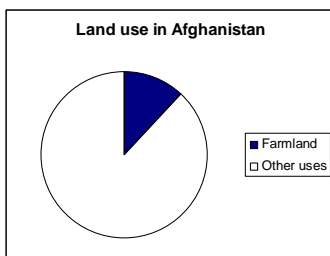


This circle shows us that our body is mostly made of water. The other things of our body are much less.

- How does this help us understand why we need to drink a lot of water, especially if we have diarrhea??

3. Now give the Learners three other circles (below) to analyze and interpret. For each circle they should answer the questions:

- What does the whole circle represent?
- What does the shaded area represent?
- What does the unshaded area represent?
- What does the circle tell us?



Milestone 4

Activity 3: Circles With More Than Two Parts

Objective: to be able to analyze circle charts with more than 2 sections

Materials: math learner book

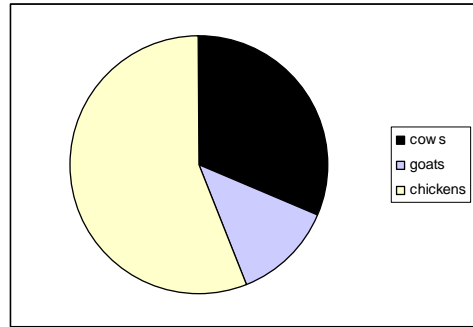
Time: 1 class

Activity

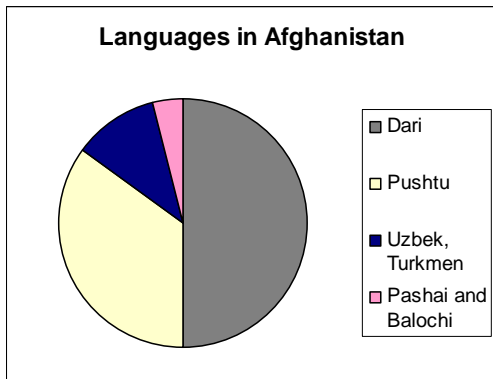
1. Sometimes there are more than 2 parts to something. For example, if a family has cows, goats and chickens and we want to show the number of animals, it might look like this:

What does this tell us about the family's animals?

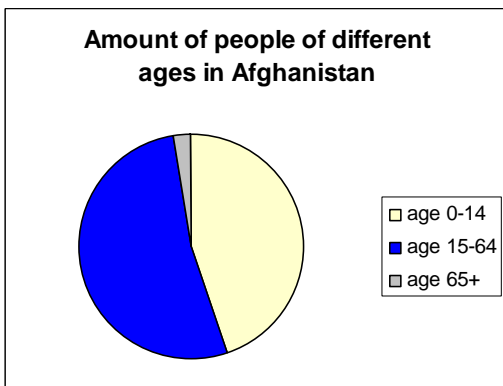
The whole circle shows the family's animals. Even though we don't know how many animals there are exactly, we know that the family has mostly chickens, and has more cows than goats.



2. The Learners should analyze the following circles as well, and answer the questions. What do these circles show?



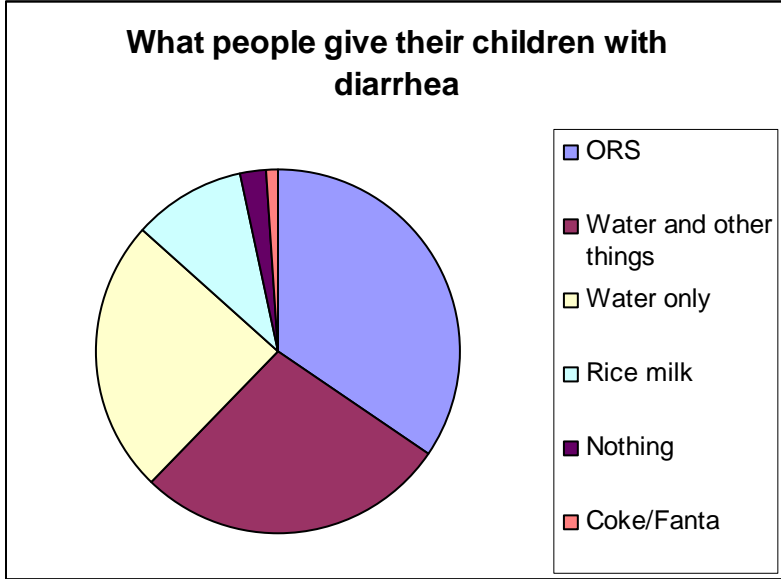
Questions: What language is spoken most in Afghanistan? What languages are spoken the least?



Questions: Are there more old people or young people in Afghanistan?

Why are there so few old people?





Questions: What do most people give their children when they have diarrhea?



Milestone 4

Activity 4: Percent Numbers as Part of a Circle

Objective: to introduce the number representations of percent, related to the circles


Materials: prepared circle cards and fraction/percent cards (see at end of activity)

Time: 1 class




Activity

Explain to the Learners what ‘percent’ means, using the information and examples below:

1. When we say “percent”, the word “hundred” is there. The number 100 is a special number and an easy number to calculate with and to use as a base or foundation. That is why we use it every time we say “percent”.

2. When we have a full circle, like this:  we say it is **100%** shaded.




Some other examples:

- a full cup of tea is **100% tea, 100 % full.**  
- our LfL class is **100% women** 


What are some other examples of 100%? The Learners should make a list.

3. When a circle is half shaded, like shaded. 50% is the same as $\frac{1}{2}$.  this: we say it is **50%**



Some examples:

- half a cup of tea is **50% full**  
- the world is **50% women** 

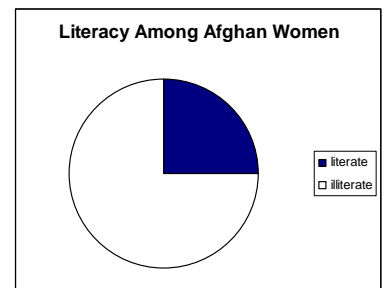
What are some other examples of 50%? The Learners should make a list or draw pictures.

4. When a circle is $\frac{1}{4}$ shaded, we say it is **25%** shaded. 25% is the same as $\frac{1}{4}$. 

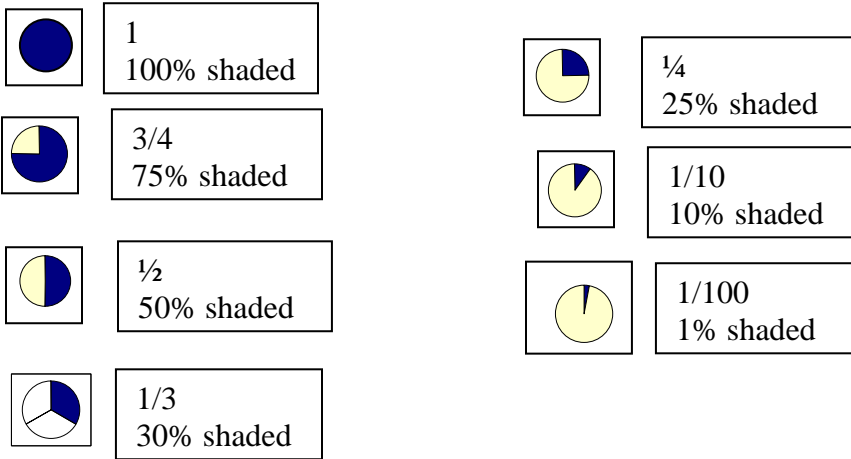
Some examples:

- This cup of tea is **25% full:**  

C4-8

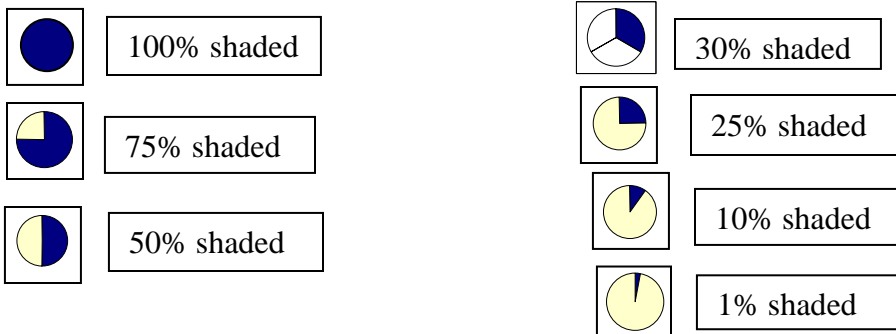


- 25% of Afghanistan’s women are literate (and this includes you!)
5. Give the Learners the prepared circle cards and the fraction/percent cards (below). Mix up the cards. They should match the circles with the percent cards as shown:



The Learners should practice this several times so they learn the fractions and the percents and the circles.

6. Once the Learners have learned this and can do it easily, cut the fraction part off of the card and let the Learners match the circles with just the percents:



The Learners should practice this several times and also discuss examples of 30%, 75%, 10%, etc.



Workbook activity for Learners

Milestone 4

Activity 5: Percent and the Rest of the Circle



Objective : to understand that the percentages must add up to 100

Materials: prepared cards from previous activity, learner book

Time: 1 class

Activity:

1. Draw this circle on the board and ask the Learners to analyze it: what percent of the earth is land?

[answer = 25%]

- What does this mean? Is the earth mostly land or mostly water?

[answer = mostly water]

2. If the earth is 25% land, what percent of the earth is water?

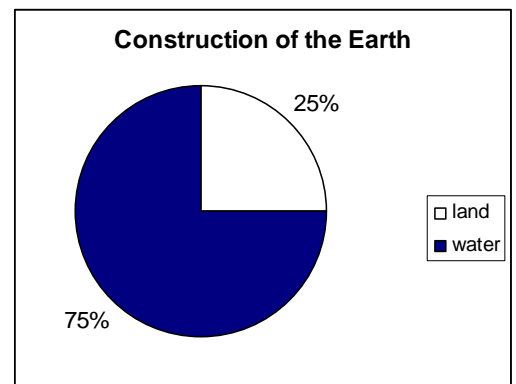
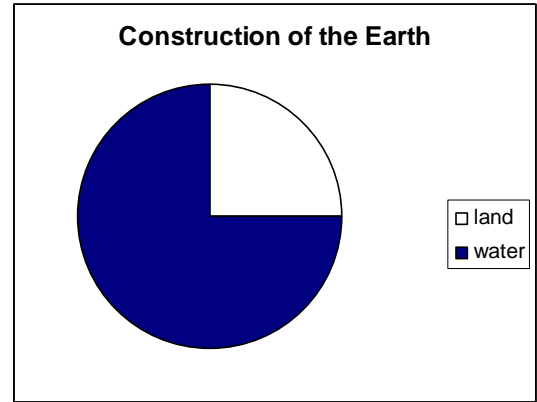
Information:

When we talk about percent, the number 100 is the special number.

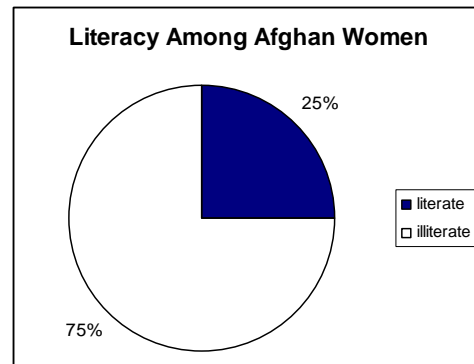
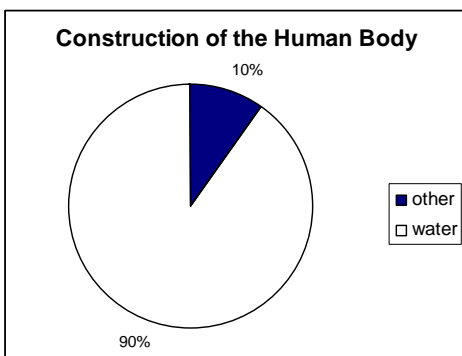
Percents must always add up to 100.

If 25 % of the earth is land, the rest is water. The whole earth is 100%. So $100\% - 25\% \text{ land} = 75\%$ remains, and so the earth is 75% water.

Now we can show the circle this way:

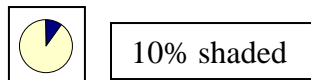


3. Looking at the other graphs we looked at before, we can now see the percentages:

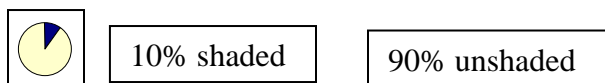


4. Using the cards from the last activity, the Learners must now figure out the remaining percentage for each circle, and write it on a card:

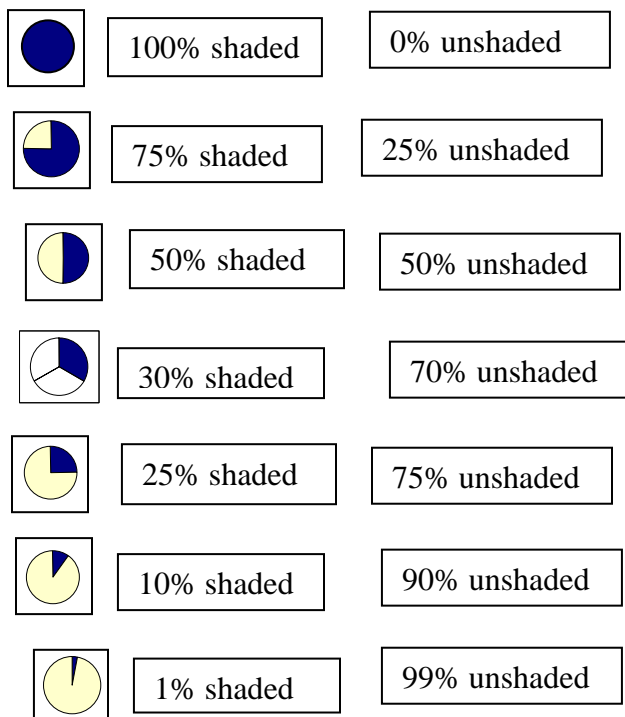
For example, from the last activity:



What percent is unshaded? $100\% - 10\% = 90\%$, so 90% is unshaded.



All the cards:



Workbook activity for the Learners

Milestone 4

Activity 6: Making Percent Circles

Objective: to give practice in generating percentage information

Materials: math learner book

Time: 1 class

Activity:

1. Ask the Learners to think about these questions:
 - What percentage of your children are girls?
 - What percentage of your day is spent in your LfL class?
 - What percentage of your day is spent doing work at home?
 - What percentage of your day is usually spent talking with friends?
 - What percentage of your money do you save?
 - What percentage of the time are your children good and well-behaved?
2. The Learners should draw circles and then represent the answers to the questions by shading the circles. They should give their circles titles and labels.
 - The Learners should answer the questions by thinking in terms of more or less than 50%, or 25%. If they compare to these, it will be much easier. The answers will not be exact, but are estimates. The Learners should also estimate the percentage.

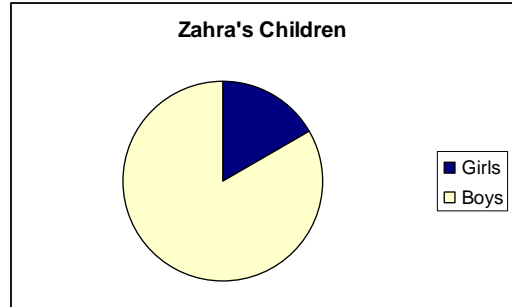


Workbook activity for the Learners

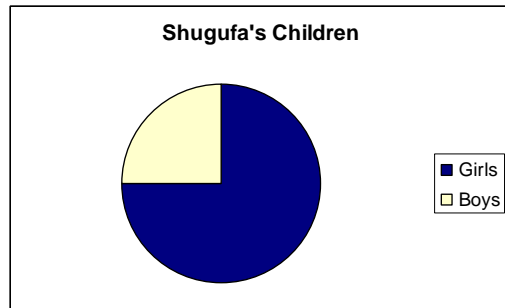
For example: “What percentage of your day is usually spent talking with friends?”

- If someone is almost always with friends talking, this might be 90% of the day.
- If more than half but not all the time, this might be 75%.
- Half of the day would be 50%.
- Less than half the day might be 25%.
- And if someone is almost never with friends, it might be 5%.

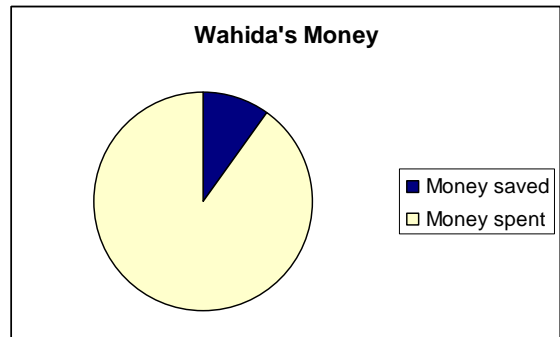
For example, if Zahra has 1 girl and 5 boys, her circle might look like this, and she might estimate that she has about 20% girls (and 80% boys) in her family. →



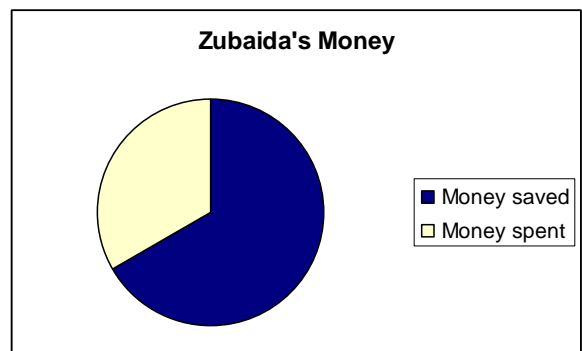
But if Shugufa has 6 girls and 2 boys, her circle might look like this and she might estimate that her family is 75% girls. →



Another example: If Wahida does not save very much money, then it would be less than 25% and her circle might look like this. →
She might estimate that she saves 10% of her money.



But if Zubaida else saves more than half of her money, then her circle would look very different: →
She might estimate that she saves 70% of her money.



3. The Learners can think of other questions or areas related to their lives that they can represent with percentages.

They can decorate their drawings or make posters, etc.

They can think about questions such as:

- What percentage of the time am I satisfied with my life?
- What percentage of our village is friendly and peaceful?
- What percentage of my family is kind and helpful?
- What percentage of the children in our family go to school?
- What percentage of my children have received vaccinations?
- What percentage of the time am I feeling healthy?
- Other questions....??



Milestone 4

Activity 7: Analyzing Percents

Objective: to gain more experience in interpreting percentage information, and to learn more information about Afghanistan and the world

Materials: math learner book

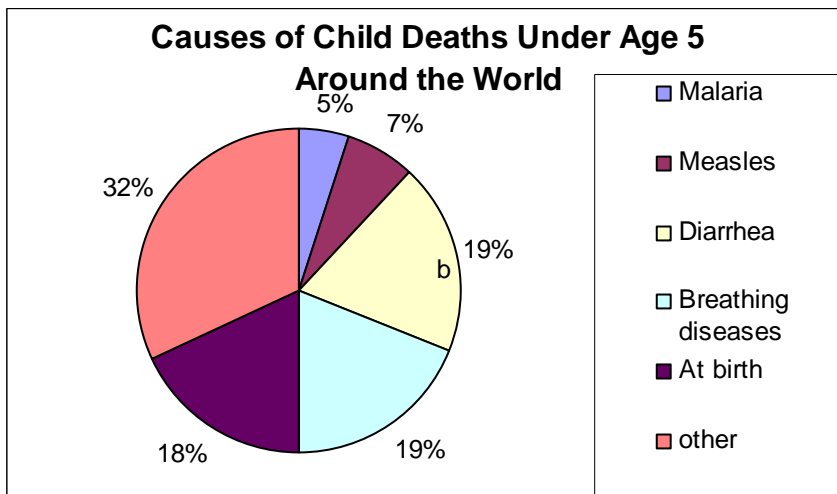
Time: 1 -2 classes

Activity

1. The Learners should work in small groups to read the percent circle charts in their workbooks and interpret what the information in the circle means.

For each graph the Learners should:

- write the title of the chart
- make a list of the information in the circle, writing the list of percentages in order from highest to lowest.
- write 1-2 sentences about what they have learned from this chart.
- write which percentage of the chart they belong to, if possible



 *Workbook activity for the Learners*

Example work of the Learners:

List of percentages of causes of child deaths

32% die from other causes

19% die from diarrhea

19% die from breathing diseases

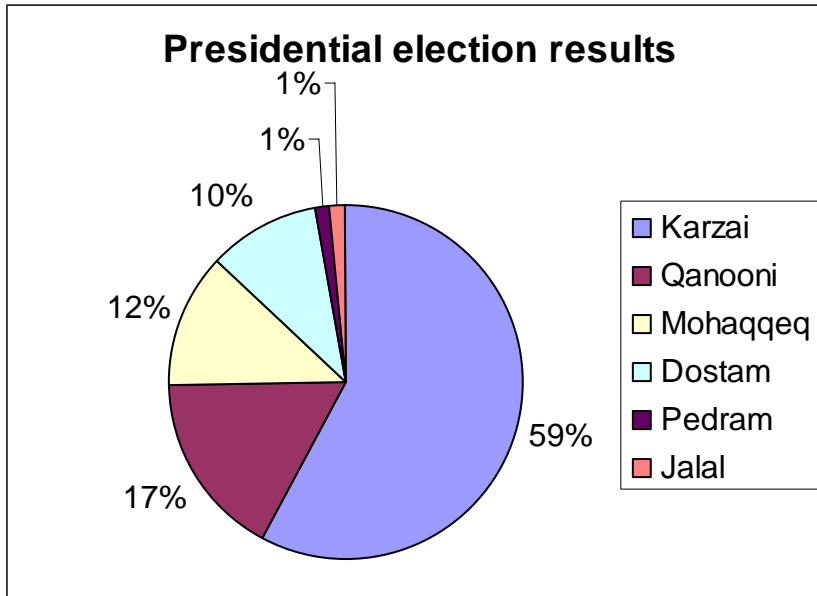
18% die at birth
 7 % die from measles
 5% die from malaria

Sentence of what can be learned from this chart

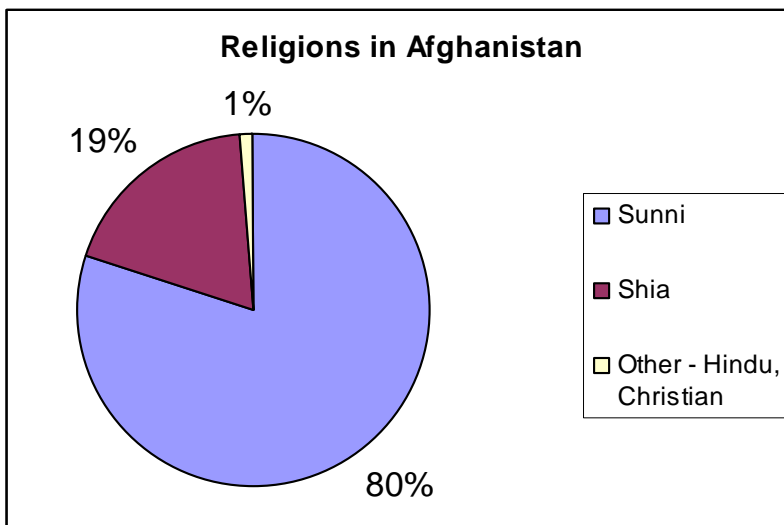
This graph shows that most children under 5 die from causes that can be prevented, such as diarrhea and measles.

Part of the graph I belong to:

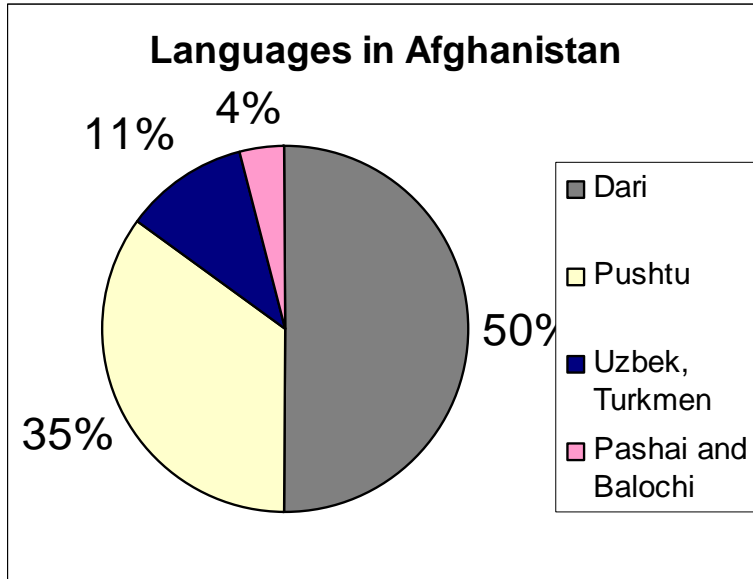
I had one child that died of diarrhea, so that child is in the 19% part of the chart.



Did you vote? Who did you vote for?



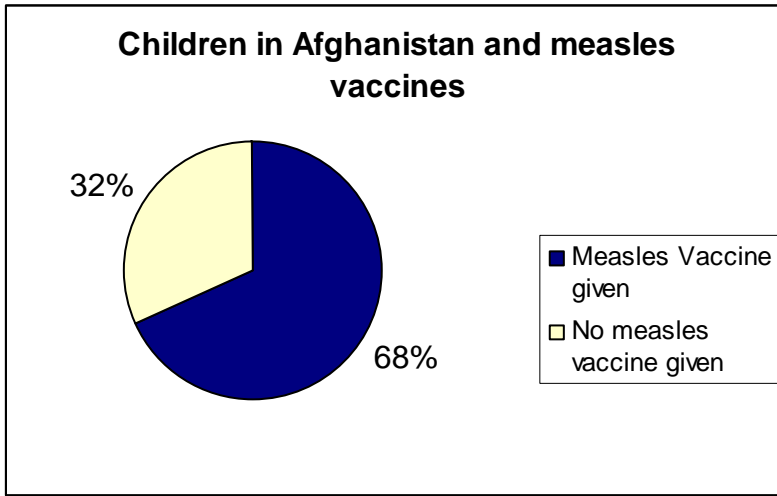
Which religion do you belong to on this chart?



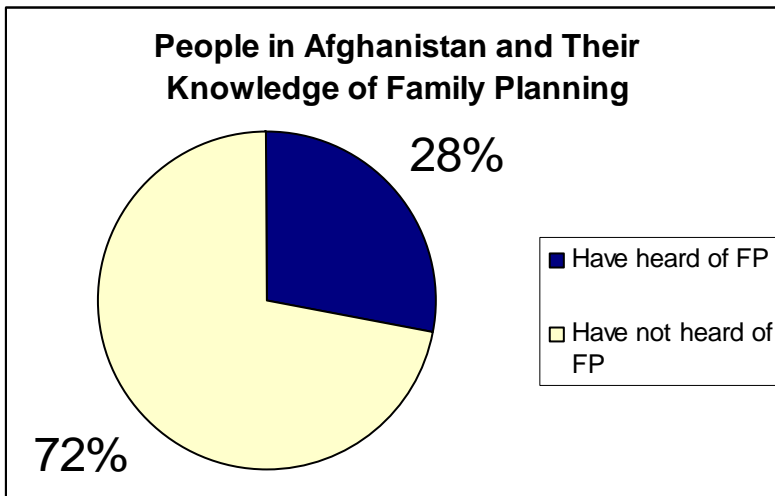
Which of these languages do you speak?



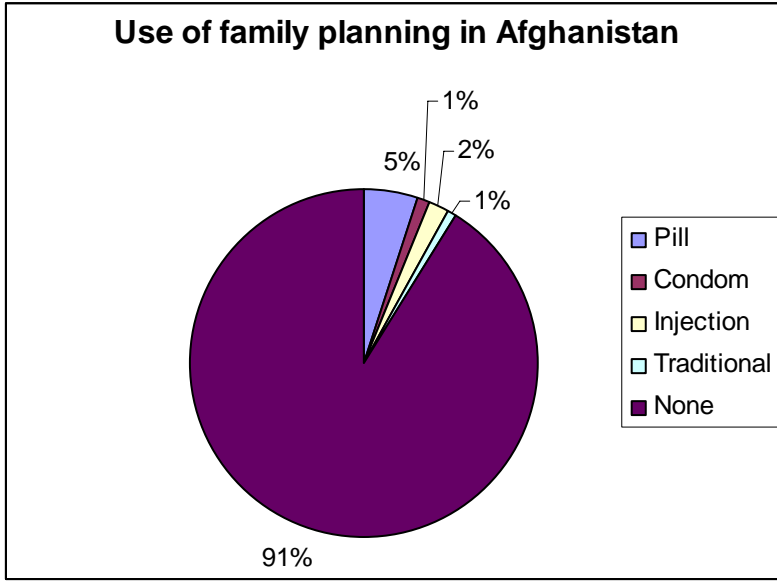
Does your family eat iodized salt as it should? Are you in the 88% who don't, or the 12% who do?



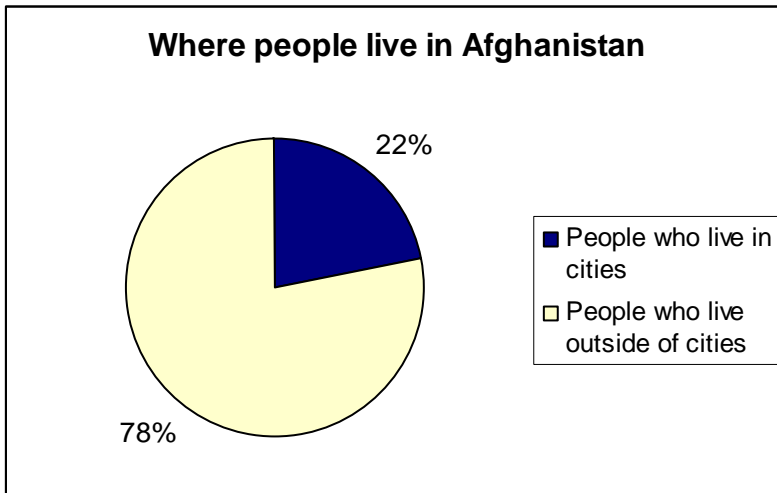
Are your children in the 68% who have received their measles vaccine, or the 32% who have not?



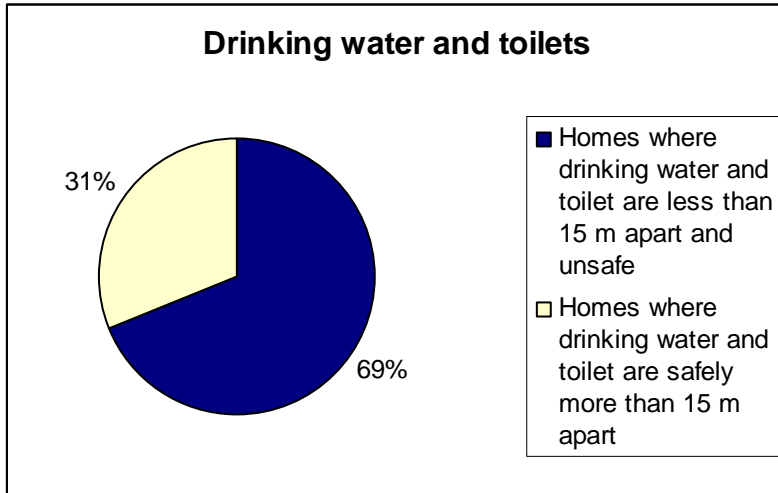
Are you in the 28% of people who know about family planning?



Do you and your husband use family planning? Are you in the 91%, or the others?



Are you in the 22% who live in a city, or the 78% who live in the countryside?



At your home, are you in the group of 31% with safe water, or the 69% with unsafe water? Is your drinking water source (your well or river or spring) more than 15 meters from the toilet, so that your water is safe to drink?

Milestone 4

Activity 8: Converting Information To Percents

Objective: to apply percentages to life issues and particularly to village issues by converting numbers to percents

Materials: learner book

Time: 2 classes

Activity

In this activity, the Learners will consider various aspects of their village and consider questions that relate to percents.

1. Sometimes we know there is a problem, for example in a village or community. But sometimes people will not believe us. Percents can help us convince others that there is a problem that affects many people and needs to be solved. Here is an example:



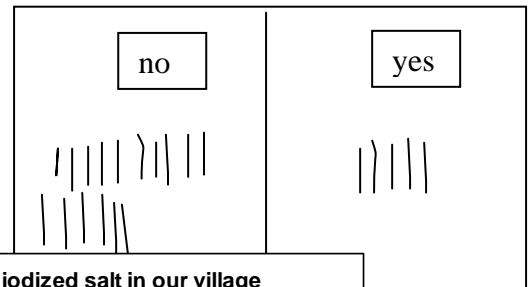
Shukria was a CHW. She was a good CHW, working hard to help her community. She had told as many people as she could about the importance of using iodized salt. But she noticed that still many children had goiter, and were not growing properly. She knew they weren't eating iodized salt.

She decided to ask the local shura to help. She wanted them to ask the local shopowners to sell only iodized salt in the village, and help make the message clear to everyone about iodized salt.

But when she went to the shura, they didn't believe her. They said that everyone was using iodized salt, and said she was imagining things.

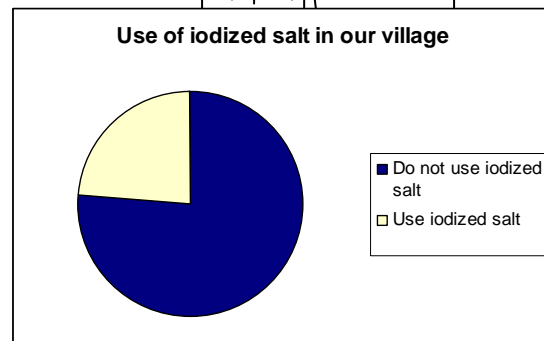
Shukria decided to prove to them that people were not using iodized salt and that they should help. One day she took a notebook and pencil and started visiting everyone in the village. She went to every house and asked every family if they used iodized salt. If they said 'yes', she made a mark on one page. If they said 'no', she made a mark on another page.

Her notebook looked like this when she was done:



She carefully counted the yes and no answers. There were 16 families that said no, they don't use iodized salt. And 5 families that said yes, they do.

Shukria knew that this meant that less than half the families use the iodized salt. This was



less than 50%. She made a circle chart to show the situation:

She showed her chart and explained it to the shura at the next meeting. They were very surprised, but agreed that it was a problem. They listened to Shukria and agreed to meet with the shopowners and tell them to sell only iodized salt. Shukria used percent to prove the need to solve a big problem.

There are many problems like this that people often think are not a problem.

Think about these questions:

- What percent of children (boys AND girls) in your village go to school?
- What percent of children get the vaccines they need?
- What percent of women get a tetanus vaccine?
- What percent of people have safe clean water to drink?
- What percent of children get enough food to eat?
- What percent of women eat enough vegetables when they are pregnant?



The perfect answer to these questions would be “100%”. If 100% of children went to school, if 100% of children had their vaccines, if 100% of people had clean water to drink, etc, then the health of people would be much better.

Are the answers to these questions in your village less than 100%?

In small groups, discuss life in your village, and what aspects of life are less than 100%.

How can you find out the answers, like Shukria did in her village?

Try to identify a problem, and find a way to get information to make it into a percentage. Once you have information about a problem, you can begin to find the causes. Then you can begin to find a solution.

With your group, make a plan for how to solve a problem in your village:

A problem in our village:

How we can get information about the problem as percents:

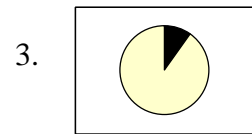
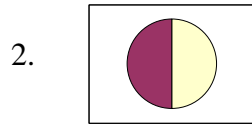
Ideas for solving the problem:

EVALUATION ACTIVITIES FOR MILESTONE 4:

1. Someone says, “80% of the children in your village are not vaccinated.”
Is this good or bad?
2. Draw a circle and shade 50% of it.
3. Draw a circle and shade 10% of it.

Answers:

1. Since 80% is more than half, this means that most of the children have not been vaccinated, and this is not good since it means most of the children’s health is in danger.



MILESTONE 5: ADVANCED MEASUREMENT

Activity 1: Measuring Things Smaller Than 100 cm

Objection: To recognize a measuring tape and the English numbers written on it. Also to learn how to use measuring tape and measuring units.

Material: Measuring tape

Activity:

1. At the beginning of the session, the Facilitator should introduce the measuring tape and explain to how to use it.
2. The Facilitator should divide the class into 10 groups, and then let each group measure 10 objects which are less than 100 cm in length and width. Each learner should write each object's name with its sizes into their notebook as below.

Description	size
Length of materials box	45 cm
Length of class board	70 cm

3. Now, the Facilitator should ask the learners to measure each other's body and find out what size each body part has such as finger, around the head, waistline and etc. then, the Facilitator should write each body part name with its sizes into their notebook, and compare them.
4. For more information, the Facilitator relates the measuring process to health issues:

Example I: Pregnant women should know that their abdomen start to grow after 3 months, and each week her abdomen grows approximately 1 cm. So their abdomen should be checked ever 3 or 4 weeks and find out if the growth happens normally.



Example II: Measurement method is used to determine whether a child are well nourished or not. A malnourished child can be diagnosed by measuring the circumference of her/his

arm. A special paper is used to measure a child's arm. And whatever number comes out, it should be written down.



Note: If there is a CHW in the class, she can be asked to explain the measuring method. If there is a pregnant woman in the class, the measuring method can be applied on her.

Milestone 5

Activity 2: How Tall Are We?

Objective: To measure the height of a learner and get familiar with greater lengths

Material: Tape measure

Activity:

1. The Facilitator should ask about measuring units, and encourage the learners to discuss it for 5 minutes.

2. The Facilitator should organize the learners in groups of 2 persons. The learners within a group should stand-up and measures each other's heights. Then the Facilitator can ask, If all the learners were to lie down in a straight line, head to feet, how long would the line of learners be?
 To determine this, the class should be divided into 2 groups and learners should measure each other heights within each group. Each group should add up their heights. Then each group summation should be added to the other group's total. This will give the total length of all the learners together.

3. The Facilitator should attract the learner's attention and explains that a learner's height is a small number but when we add all learners' heights, then it results a large number. The total of all learners' heights are comparable to the distance between the nearest health center and their home. For example, the average height of the learners is 170 cm and when we add up 15 learners' height, it results 2,550 cm which equals to 22 m and 50 cm. This number resembles to a distance. The Facilitator should make a few questions relating to this activity as below:
 - How far is the LFL center from your home?
 Fatema says, it is about 20 m
 - How far is the nearest Clinic from your home?
 Wahida says: it is about 10 m
 - If we add up Fatema and Wahida's answers what is the results?
 Farida says: 30 m.
 - How far is the LFL center from your village?
 Nazia says: 40 m

Then, the Facilitator says, look the distance from LFL center from your village is 2 times more than the total number of your heights.

Milestone 5

Activity 3: Measurement of Objects Larger Than 200 cm

Objective: to be able to measure, read and write objects larger than 200 cm.

Material: Measuring tape

Activity

1. At the beginning of the session, the Facilitator should introduce some objects larger than 200 cm such as the lengths of the yard, height of the class, height of trees and etc. Maybe, some objects have more than 200 cm length/ width so the Facilitator should instruct how to write them.
2. Then, the learners should measure the lengths of their classroom, width of the windows and heights of the door so they practically observe that large numbers results from large objects measurements. For example 250 cm, 320 cm, 470 cm and etc
3. The Facilitator should ask the learners to write the resulted numbers into their notebooks and then, read them loud out.
4. Then, the Facilitator should organize groups of two person, then instruct that each group should measure 10 objects larger then 200 cm inside and outside of the class such as, lengths and widths of the carpet, height of the curtain, height of the door and etc. The learners should write each objects name with their size into their notebook and then read them loud out.

Milestone 5**Activity 4: Conversion of Kilometer into Meter and Centimeter**

Objective: to recognize kilometer (km), meter (m), and centimeter (cm)

Activity:

1. The Facilitator should prepare some cards and write different questions related to the activity. The paper card should be left in front of the learners upside down and each learner should come, pick a card, read the question, think about it and give answer to it.

For example:

$$15 \text{ cm} = ? \text{ m}$$

$$50 \text{ cm} = ? \text{ m}$$

$$1 \text{ m} = ? \text{ cm}$$

$$10 \text{ km} = ? \text{ m}$$

$$500 \text{ cm} = ? \text{ m}$$

$$100 \text{ mm} = ? \text{ cm}$$

$$500 \text{ m} = ? \text{ km}$$

At the end of the session, the Facilitator should write, what the learners said, to the class board, and have the learners to discuss about it. The learners should practice on some measuring units such as centimeter and meter.

Milestone 5

Activity 5: Distance Between the Earth and the Moon

Objective: Learners will become aware of the distance between the earth and the moon

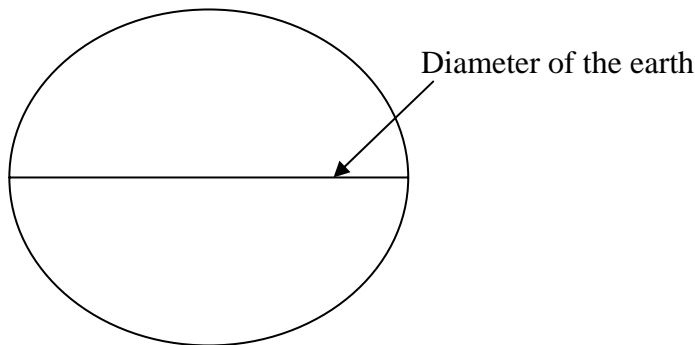
Material: Image of the moon and the earth

Time: 45 min

Activity:

1. The Facilitator should ask the learners to guess how far is your home from the villager head (in meter)? How far is one village from another? And how far is your village from Kabul (in km)?
2. Then, the Facilitator should draw pictures of the earth on the class-board, and describe it.

This picture shows the circumference of the earth



The earth's circumference is about 40,000 km. The line which divides the globe into two equal parts is called the diameter of the earth and it is about 12,000 km length.

Imagine, it takes one year to walk all around the globe.

3. The Facilitator should ask a few questions about the moon:
 - How far is the moon from the earth?
 - What is the diameter of the moon?
 - Does the moon have light?

After discussion about the moon, the following information should be given to the learners:

- The moon is smaller than the earth.
- The moon has no light from itself and gets light from the sun
- The distance between moon the earth is approximately 384,400 km as below:

The Facilitator should ask the learners to copy the distances in their notebook.

4. The Facilitator explains:

The moon's diameter is about 3,476 km and it looks very small because it's so far from the earth.

The Facilitator should take the all learners to the yard and remind them of an airplane flying or a bird flying. Then she asks why airplanes while flying or a bird while flying look smaller than their real size? Then, the Facilitator says, because they are very far from us that are why they look smaller than their real size.

5. The Facilitator should say to the learners that after all discussion we made, note down all the information you learned so far into your notebook and draw some figures for moon and earth.

Milestone 5

Activity 6: Conversion of Kilogram to Gram and Vice Versa

Objective: to become able to convert larger units to smaller ones and vice versa

Material: board, chalk, notebook, and pen

Activity:

1. The Facilitator should divide the class into many groups and each group should be given questions to make discussion and practice unit conversion.
 - Group I: $500 \text{ mg} = ? \text{ gr}$
 - Group II: $100 \text{ gr} = ? \text{ mgr}$
 - Group III: $4.5 \text{ kg} = ? \text{ gr}$
 - Group IV: $1 \text{ kg} = ? \text{ mg}$

After all groups finished their exercises, should compare their work with another groups, and correct each other mistakes. Then, each group should explain what pattern they used and write them on the class-board.

Milestone 5

Activity 7: How Many Kilograms Are We?

Objective: to be able to add up all learners' weights resulting in a large number

Material: Flipchart, notebook, and pen

Activity:

1. The Facilitator should ask the learners to how they describe kilograms and grams, and what objects can be measured with grams and kilograms?
The Facilitator should write the learners's answers to the class board.
2. Then the Facilitator should ask the learners, if they have measured their weights when they were in the city. Ask one learner to share her weight. For example, Jamila may say that she is 70 kg.
3. Then the Facilitator would say to other learners, that you can determine your weight according to Jamila's weight. If you are slimmer than Jamila, it means you are less than 70 kg, but if you are fatter than Jamila then, you are more than 70 kg.
4. The learners should be divided into many groups, then they start finding out each other weight within each group. Each individual's weights should be summed up and the group's total weight should be told to the Facilitator. Then, the Facilitator should write them on the class board and have the learners to sum the all group's weights up and then copy them into their notebook.
5. Perhaps, total weights of all learners equals to a large number, for example 120 kg. Then, the Facilitator encourages the learners to discuss about it.
6. The Facilitator organizes the learners in pairs, encourage them to ask questions from each other and then note them down. The Facilitator should write whatever the learners said on the class-board. Then the Facilitator should say: the total weight of all learners is almost equal to the monthly consumptions of flour and rice of many families.

Milestone 5

Activity 8: Determining Approximate Weights

Objective: To gain skills of estimation, estimating different weights such as an elephant's weight, mouse's weight, ant's weight and etc.

Activity:

1. The Facilitator should hang some pictures of different objects in front of the class such as: elephant, mouse, eye, mulberry, heart, ant, liver, and etc. then, she divides the class into many groups. Each learner within a group should look very carefully to the pictures and guess a weight for each object. Each group should compare their work with each other in order to find out which group's estimation is logical.
2. Then, the Facilitator should ask each learner to come in front of the class and write the estimated weights of each objects she made and the units she used, under its real picture. For example, elephant weight = 7000 to 12000 kg.

Then, Facilitator should give some information about weights units as instance:
 $1 \text{ ton} = 1000 \text{ kg}$ so $7000\text{kg} = 7 \text{ ton}$ and $12000 \text{ kg} = 12 \text{ ton}$

3. The Facilitator should divide the class into 3 groups and give a specific task to each group. For example, the first group should list those objects measured with kilogram, the second group should list those objects measured with gram, and third group should list those objects measured with milligram. The Facilitator should encourage the learners to make group discussion.

Milestone 5

Activity 9: Measuring with Liter

Objective: to recognize liter, and know how to measure with liter

Material: scissor, pen and coca-cola bottle

Activity:

1. The Facilitator should start the activity by asking a few questions such as:
 - How do you measure rice, kidney beans, peas, etc while you are cooking?The Facilitator should write the learners' answers on the class board.
2. The Facilitator should organize the learners in pairs, and have them to work and discuss how to measure cereals in everyday life. Perhaps, some people use milk can, tea-glass, or bottles.
3. The Facilitator should pour 4 glass of water into an empty bottle of coca-cola and marks that place where the water level reached. Then, she should remove the water from the bottle and cut it from marked place. Here we have a pot of one liter capacity.
4. After preparing one liter, the Facilitator should ask every learner to prepare a pot of one liter by using 4 glass of water and an empty bottle of coca-cola. So that, every learner becomes able to make a pot of one liter and use them in their everyday life.

Milestone 5

Activity 10: To Recognize Small Units of Measurement Such as Milliliter

Objective: to recognize milliliter and determines size of syrup, bottle, serum bags, syringes and etc.

Material: syrup bottle

Activity

1. The Facilitator should explain that every type of measurement has large and small units. For example there is centimeter smaller than kilometer, gram smaller than kilogram and milliliter smaller than liter. Now, the Facilitator should introduce liter and milliliter, and adds that 1 liter equals 1000 milliliters.
2. Then, the Facilitator should show some pictures of bottles indicating milliliter and liter degrees as below:



3. The Facilitator should divide the class into two groups. One group should list tablets which have milligrams labeled, and the other group should list syrup, syringe and serum with milliliters labeled.

Then Facilitator should describe the difference between measuring solids and liquids. For example: solids are measured with gram (g) and liquids are measured with liter and milliliter. At the end of the session, Facilitator should practically show 20 milligram syrup in a tablespoon.

Note: The Facilitator should add, be very careful and read the direction before giving medicine to a patient. For example: If a 2 milliliter spoon is required to give medicine to a child, you should not use a 5 milliliter spoon.

Milestone 5

Activity 11: Conversion of Liter and Milliliter

Objective: to become able to measure liquids with liter

Material: 1 liter pot, syringe, and water

Activity:

1. The Facilitator brings different types of dishes to the class in order to measure liquids
 - 5 ml should be measured by syringe
 - 1 ml should be measured by dropper
 - 1 liter should be measured by glass
 - Show me the pot for measuring 1 liter of water.
 - Measure 0.5 liter of water.
 - Measure 1.5 liter of water

Different types of dishes can be used to measure liquids, such as glass, bucket, syringe, dropper and etc. It's recommended to do this as working group.

Milestone 5

Activity 12: Water Consumption (in liter)

Objective: to become able to measure water in liters.

Material: bucket, 1-L pot

Activity:

1. The Facilitator should ask the following questions:
 - How much water does Jamila use during 24 hours?
 - How much water do all the learners in this class use in 24 hours?The learners should give answers to the above questions and the Facilitator should record them on the class-board.
2. The Facilitator should ask how much water a bucket takes. Perhaps, the learners respond, we don't know. Then, the Facilitator says let's use the one-liter-pot we made before and find out how much water a bucket takes.
3. Then, the Facilitator along with the learners start pouring water to an empty bucket by use the one-liter-pot until it get full. It may take 15 or 20 pots it depends on size of the bucket. If the bucket takes 15 pots, it means 15 liter is the capacity of that bucket. Then, the Facilitator should ask the learners, how many bucket of water you spend in 24 hours. Let the learners calculate how many bucket of water they use if a bucket is 1 liter.
4. The Facilitator should divide the class into many groups, and each group should be given a flipchart to record their water consumption. The water consumption should be calculated by bucket first and then it should be calculated with liter. Should be recorded in flipchart.

Milestone 5

Activity 13: How the Heart Works

Objective: to get information about heart's function and capacity

Material: A picture of heart on the flipchart

Activity:

1. The Facilitator should ask a few discussable questions such as:
 - What shape and structure does the heart have?
 - What are the heart's functions?
 - How much blood does the heart pump in one minute?
 - Where is the location of the heart in human body?
2. The Facilitator should draw a picture of a heart on the flipchart, and then let the learners discuss about it and give answer to the above questions. Then, she records the learners' answers into the flipchart. After she listens to the learners' discussion, she should add some more information about heart.
3. the Facilitator should give some useful information relating to the above topic such as:
 - the normal weight of the heart is about 0.5 kg
 - the main function of the heart is pumping the blood to all body parts
 - the blood circulation happens 1000 times in 24 hour
4. The Facilitator says, 5 liters of blood circulate in our body. This means the blood goes inside our heart and then pumps back to all parts of our body. The Facilitator should ask the learners to bring the 1-liter-pot which we prepared before, and then she measure 5 liter water with that 1-liter-pot. The learners can see how much 5 liters blood is, which circulates in our body every time.
5. For better understating, the Facilitator should show a rubber made ball which she made many small holes to the ball. Then, she put the ball into a bucket of water, the ball getting full of water, and while she squeezing it, the water is going out of the ball. The above experiment shows how the blood circulation works. The blood goes to the heart through veins, and it is pumped back by heart to all parts of body via arteries. And the circulation blood volume is about 5 liter.

The Facilitator also explains how to check a person's pulse by putting your thumb over her right/left wrist and counting her heart beats for one 1 minute.

Milestone 5

Activity 14: Loss of Body Water During Diarrhea

Objective: to become able to understand how much water our body needs, and how much water loses

Material: Picture, and text of activity

Activity:

1. The Facilitator ask the following questions:
 - How much water you drink in a day?
 - Who drinks more tea/water in your family and how many glasses?
 - What is the importance of water in living organism?

After a discussion, the Facilitator should give an example related to importance of water in living organism.

For example, we have two flower pots. We leave a flower to a flower pot and pour some water into it, and also we leave a flower to a flower pot and do not pour water into it. After 24 hours we will notice the flower with water is fresh but the flower with no water is not fresh. As we discussed earlier, water has a vital role for all living organisms. Liquids form 80% of our body. Our body loses 2.5 liter of its water in sweating, breathing, and urinating. We need about 2 liters of water every day and we take this much water by eating food and drinking water and tea. If we do not get enough water we will get headache, sad, tired, and impatient.

1. The Facilitator should divide the learners into 3 groups. And give each group a specific tasks as follows:
 - Group I: Normally, how much water does our body need in 24 hours?
 - Group II: In hot weather, how much water does our body need in 24 hours?
 - Group III: How much water is lost in diarrhea in 24 hours?

All groups should complete their tasks then write them in a chart as below.

Conditions	Quantity of water our body loses	Quantity of water our body needs
Normal		
Diarrhea		
Hot weather		

2. At the end of the session, the Facilitator should give the following information.
 - Normally, our body needs 2 liter of water in 24 hours.
 - In hot weather, our body needs, more than 2 liter of water in 24 hours

- More than 3 liter of water should be given to a person who have diarrhea.

Conditions	Quantity of water our body need	Quantity of water our body lose
Normal	2 liter	Less than 2 liter
Diarrhea	More than 2 liter	More than 2 liter
Hot weather	More than 3 liter	Depends on illness

Milestone 5

Activity 15: How to Use a Thermometer

Objective: to recognize thermometer and know about body temperature.

Material: thermometer picture

Activity:

1. The Facilitator ask the following questions:
 - How do we get fever?
 - What should you do when you have got fever?
 - What should you give to treat a person who has fever?

The Facilitator should listen to the learners at first, and then, she put some more information to make it more complete.

When germs go into human body the temperature of the body goes up. This high temperature against germs is called fever.

When somebody’s temperature is high we should wipe her forehead with a clean cloth which has been soaked in cold water. And the cloth should be rinsed often so it doesn’t get warm. Also we should give lemonade with ESFARZA to the sick person.

2. Then, the Facilitator introduce thermometer as below:
Thermometer is a graduated glass tube with a bulb containing mercury that expands and rises in the tube as the temperature increases. When you put a thermometer on your mouth it shows your body temperature.
3. The Facilitator should ask the following questions:
 - When our body temperature gets to 37 degree, do we feel fever?
 - In what degree the water is freezing
 - In what degree the water start boiling?

After a discussion, the Facilitator should give the following information.

0 centigrade	37 centigrade	100 centigrade
Water is boiling	Water is normal	Water is freezing

Milestone 5

Activity 16: Temperature of Human's Body, Water and Weather

Objective: to know about temperature of human's body, water and weather and also get aware of hottest places and coldest places of the world.

Material: Thermometer, world map

Activity

1. The Facilitator should ask the learners to check each other's temperatures and compare, then Facilitator explains that human body temperature is normally 37 centigrade, if the temperature goes higher than 37 it shows fever. If it gets to 40 or 45 it means the person has severe fever and possibly coma.
2. The Facilitator should ask the learners to start practicing with a thermometer: One of the learners checks another's temperature by putting a thermometer in her mouth and reading the thermometer indicator.
3. The learners should be divided to many groups and practice reading thermometers, if they face with problem, the Facilitator should help them. They may need help in learning how to read the thermometer.
4. The Facilitator should divide the class into many groups and ask them to describe temperature of four seasons. After discussion, the Facilitator should correct the learners' mistakes and add more information. Such as, when water temperature gets to 80-100, it starts to boil. And when the temperature gets to zero, the water start to freeze. Then Facilitator should ask a few questions as following:
 - In your opinion, what is the temperature of the sun?
 - Can a living organism stay near the sun or not?

The Facilitator should listen to the learners at first, and then give the following information to them.

The sun's temperature is about 6000 centigrade and if any objects go near to the sun, it will be melted due to the sun's heat, so no living organism and no objects can go or stay near to it.

Then, the Facilitator asks the learners, if they have heard about the weather and temperature of Afghanistan's provinces. Learners would exchange their views about the weather and then, the Facilitator asks if the learners know about hottest place and coldest place of the world.

After a discussion, the Facilitator explains: the hottest places of the world are the North America, Aljazirah, Egypt, Libya and West deserts. The temperature in these areas gets to 57 centigrade.

The coldest place of the world is Antarctica. The temperature in these areas gets to -88 centigrade and is almost entirely by the ice sheet. Only a special type of bears can live there.

EVALUATION ACTIVITIES FOR MILESTONE 5

1. The Facilitator should write different questions on each paper card then leave them upside down in front of the learners. Each learner should pick up a paper card, read it and then answer it.

For example:

- How can you use a thermometer?
- Is the earth bigger or the moon?
- What percent of our body is water?
- How many kilogram equals to 1 ton?

The Facilitator can make such examples as above and evaluate the learners.

**MILESTONE 6:
GEOMETRICAL SHAPES AND MAPPING SKILLS
(DRAWING SHAPES AND SYMBOLS)**

Description of the Milestone:

In this milestone, the Learners will recognize geometric shapes and learn how to name and draw them such as triangle, angle, circle, square, rectangle, hexagon, pentagon and etc.

Learners would have seen those shapes before, so they will see the relationships of those shapes with their lives.

Note: As the subjects in Milestone 6 Level 2 and Milestone 6 Level 1 are the same, all the activities are repeated from Level 1.

Milestone 6

Activity 1: To Introduce Geometrical Shapes

Objective: To recognize different types of geometrical shapes

Material: Class-board, chalk and flipchart

Time: 40 min

Activity:

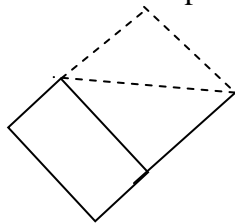
1. Facilitator should give a paper to the learners and ask them, how many corners and sides does it have? In terms of geometry, what geometrical shape does the paper have? Now, show them the corners and sides in a rectangle shape, and ask them what terminology is used for corners and sides in geometry?

side

2. Fold a paper vertically from the middle, and ask the learners how many rectangles they can see? Is it equal on both sides?

Note: Two rectangle shapes are made from folding vertically a paper from the middle section.

3. Using a rectangular shaped paper, fold it from corner section the way that it shows a triangle shape and cut the remaining part off. Now, ask the learners what geometrical shape does the folded paper show? Are the sides equal with each other? What shape does the cut-off paper (remaining part) show?



Note: A triangle is made.

4. Put two papers on each other the way that one paper's length locates on another paper's width. Cut off the remaining part. Ask the learners what geometrical shape is made?

Milestone 6

Activity 2: How to Make a Scalene Triangle (triangles with unequal sides)

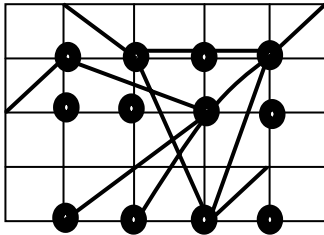
Objective: To become able to recognize different types of triangles, and to know that a triangle can have different angles and different sides

Material: board, nails, rubber band

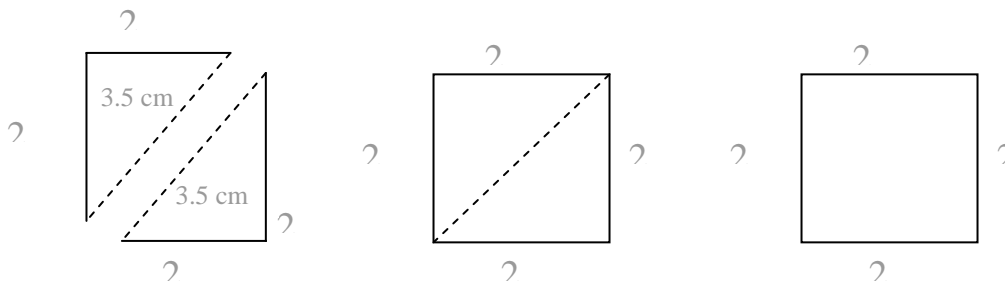
Time: 40 min

Activity:

1. Divide the class into two groups and give each group a few nails, rubber, and a board. Ask them to hammer a few nails in a board and put each rubber band around different nails to make different triangle shapes. Later on, they would become able to make scalene-triangles by putting rubber band around nails.



2. Now, ask each group that how many triangles they made? Have they made only scalene-triangles or different types too? Count each type.
3. For further practical activity, give them a square shape papers and ask each learner to cut them off from top-right-angle towards bottom-left-angle via scissors as below.



4. At the end of the session, make an evaluation of the learners. Ask them to put dots on a paper and then connect dots with each other in order to make geometrical shapes. Learners should explain their work by presenting geometrical drawings. If they have problem in making triangles by paper and scissor, or if they have trouble in recognizing triangles, then facilitator should help them to learn it.

Milestone 6

Activity 3: Comparing Triangles, Squares, and Rectangles

Objective: To become able to recognize different type of geometrical shapes and make them with paper, as well as understand differences among the geometrical shapes

Material: board, paper, and scissor

Time: 40 min

Activity:

1. In the beginning, ask the learners if they know geometrical shapes based on their own experiences.
For instance: Some dishes are square shape, some of them are rectangle shape and some of them are circle shape.
2. Draw a few pictures of square, rectangle, and triangle in a flipchart and hang them in front of the class. Then, ask the learners to discuss:

Examples:

- What differences do you notice among each shape?
 - How many sides and angles do the different shapes have?
 - What geometrical shapes are used for house construction and designing?
3. Now, Facilitator should ask the learners to come in front of the class and draw some shapes on the board. Then, have the learners to look at the shapes carefully, and say how many angles and sides each shape has?
 4. Ask the learners to work in groups, and each group should look around within the classroom, and list any geometrical shapes they recognize. For example one group should list square shapes, and another group lists rectangle shapes and so on.

Milestone 6

Activity 4: Making Different Polygons

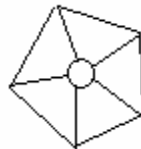
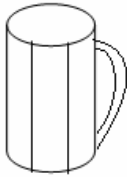
Objective: To learn different types of polygon by looking at them and drawing them, and to understand the importance of polygons in building construction

Material: Pencil and sample of steeple

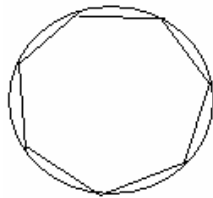
Time: 40 min

Activity:

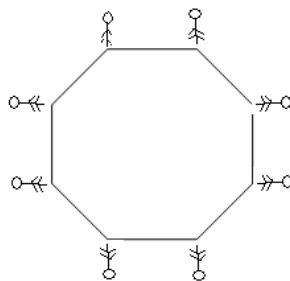
1. At the beginning, the Facilitator should ask a few questions about previous lesson such as angles, circles, squares, triangles, and rectangles. Then, she draws a hexagon-shaped glass shape on the flipchart. The learners should explain how many angles the glass has, and how the lines are connected with each other.



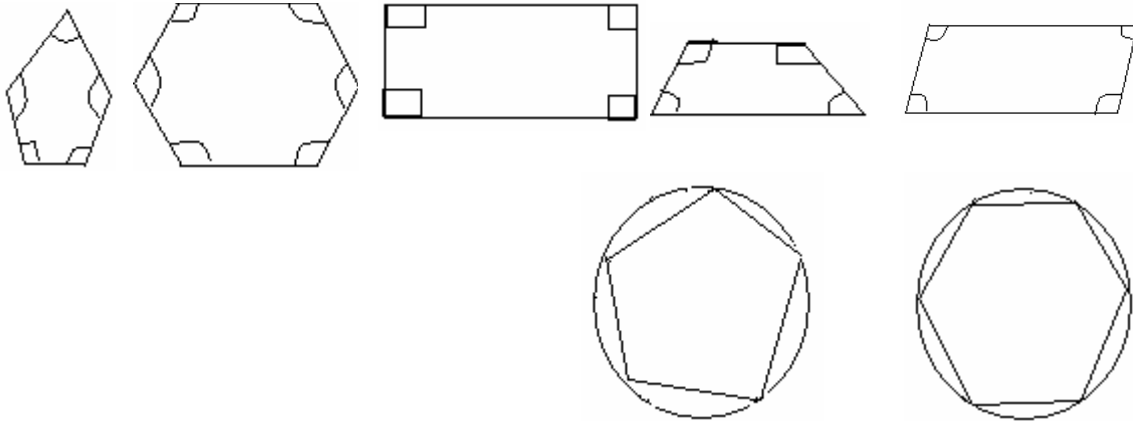
2. The Facilitator should draw a few circles on the flipchart and hang them in front of the class. The learners should copy them to their notebooks and put dots on different location but exactly on the circle line. Connect each dot with each other to make squares, pentagon, hexagon and heptagon shapes.



3. After the learners completely finish their exercise, the Facilitator should check their work and correct their mistakes. Then the Facilitator divides the class into groups. The Learners should arrange themselves to make various shapes, such as a hexagon, pentagon, etc.



1. The Facilitator should put geometrical shapes on two flipchart and also divides the class into two groups. Learners should copy the shapes into their notebooks and see which shape has more angles then others, and what the differences are.
2. Question: Some shapes have more angles then others, why?
Answer: Those shapes have more sides, they have more angles as well.



Milestone 6

Activity 5: To Use Drawn Shapes and Develop Them Into New Different Forms

Objective: to become able to use a shape for making new different shapes

Material: paper, materials to make a practical board: piece of wood with nails hammered in 3 rows, rubber bands

Time: 40 min

Activity:

1. At the beginning, the Facilitator should show a few shapes to the learners and ask them to name these shapes according to the geometry. During this activity, the learners will learn how to make different geometrical shapes.
2. The Facilitator should provide a practical board: a board with nails hammered in 3 rows which can be used for making geometrical shapes with rubber bands around the nails. Then, the Learners should make a rectangle shape with the practical board and develop it to many square and rectangle shapes. And also the learners should make a triangle shape with the practical board at first, and then develop it to many squares and rectangle shapes.
3. At the end of the session, the Facilitator should divide the learners into many groups and ask each group to count the number of angles in prepared geometrical shapes. And also, the learners should recognize the geometrical shapes within their homes such as carpet, windows and so on.

Milestone 6, Activity 5: To Use Drawn Shapes and Develop Them Into New Different Forms

- Objective:** to become able to use a shape for making new different shapes
Material: paper, materials to make a practical board: piece of wood with nails hammered in 3 rows, rubber bands
Time: 40 min

Activity:

1. At the beginning, the Facilitator should show a few shapes to the learners and ask them to name these shapes according to the geometry. During this activity, the learners will learn how to make different geometrical shapes.
2. The Facilitator should provide a practical board: a board with nails hammered in 3 rows which can be used for making geometrical shapes with rubber bands around the nails. Then, the Learners should make a rectangle shape with the practical board and develop it to many square and rectangle shapes. And also the learners should make a triangle shape with the practical board at first, and then develop it to many squares and rectangle shapes.
3. At the end of the session, the Facilitator should divide the learners into many groups and ask each group to count the number of angles in prepared geometrical shapes. And also, the learners should recognize the geometrical shapes within their homes such as carpet, windows and so on.

Milestone 6

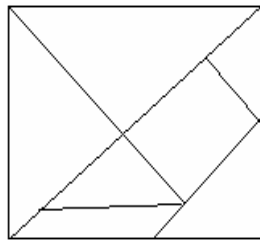
Activity 6: Geometrical Puzzle

Objective: to cut the geometrical shapes into many small pieces and put them back together to reform the primary shape

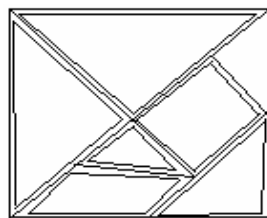
Material: Pen, notebook, and geometrical shapes

Activity:

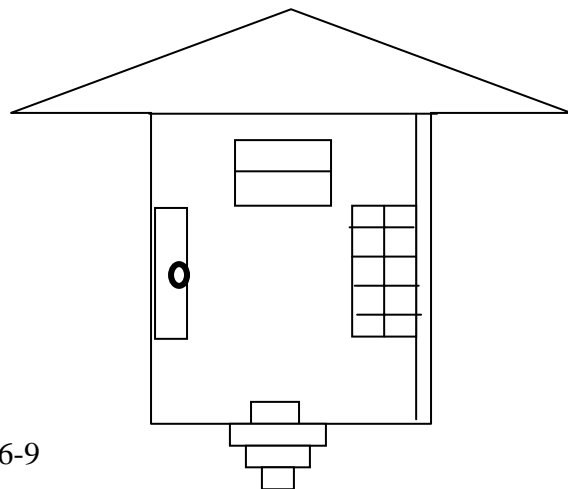
1. The Facilitator should ask the learners to look around the class carefully, and write geometrical names of any shape they can recognize within their classroom. Then, draw a square on the flipchart, divided by lines inside the square. The learners should copy the square into their notebooks and cut it up according to the lines. Then each shape should be labeled with the name of its shape.



2. The learners should assemble all component of the square which they had cut up before, and put them back together to make the original square.



3. The Facilitator should ask each learner to draw a house and look at it carefully in order to find geometrical shapes. Then, each learner should name any geometrical shape they can recognize and write them down into their notebook.



Milestone 6

Activity 7: Similarities and Differences in Artistic Shapes

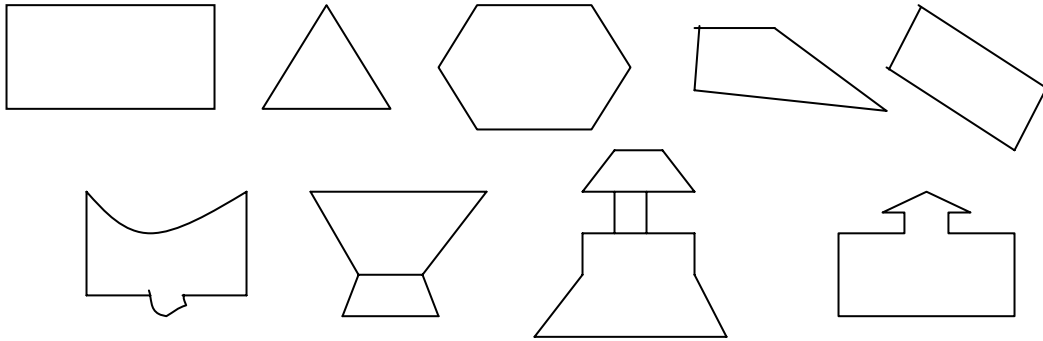
Objective: to recognize the different shapes and improve learners' drawing skills

Material: artistic drawing

Time: 40 min

Activity:

1. The Facilitator should draw the following shapes to a flipchart and hang it in front of the class. Then, learners should look at the shapes carefully and say names of any shape they recognize.



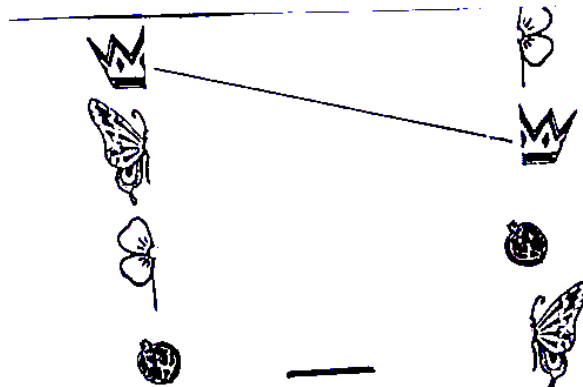
2. The Facilitator should introduce symmetrical shapes and have the learners to practice with symmetrical shapes.

Symmetry shapes are those shapes that when we cut them down the middle, both

pieces would look similar such as: face  , apple  apricot seed,

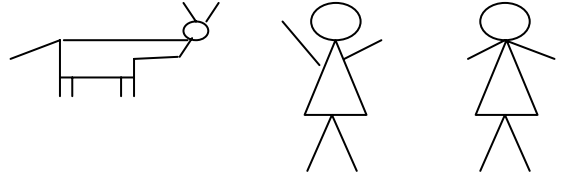
some leaves  etc.

3. The Facilitator should ask the learners to copy the shapes from the flipchart into their notebooks, and find out which shape can be a symmetry shape, after cutting them off from the middle part.

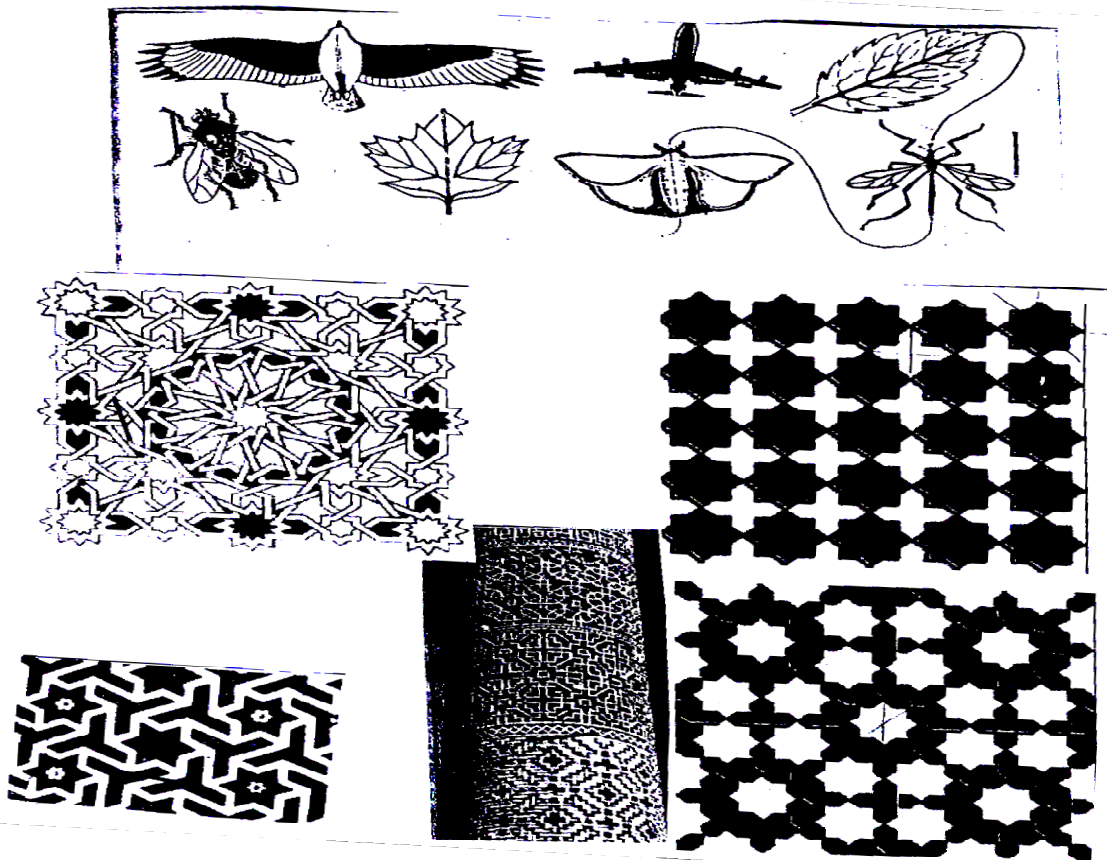


- The Facilitator should show different shapes to the learners and ask them to find out which one can be a symmetry shape, after cutting them down the middle.

- The Facilitator should ask the learners to draw some geometrical shapes into their notebook according to their tailoring experience.



- The Facilitator should show a few examples of shapes which are used in designing carpet, mosques and so on.



MILESTONE 7: DECIMAL NUMBERS

Description of the Milestone:

The aim of this milestone is to reinforce the learners' ability to know/learn the signs and symbols. They will also change decimal fraction to common fractions and learn one's, tens, hundreds and thousands.

Milestone 7**Activity 1: Classification/Grading**

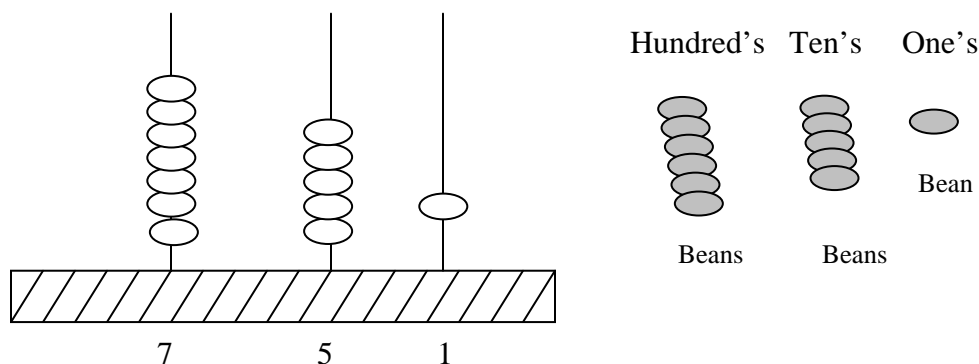
Objective: In this activity the learners will practice the numbers' classification/grading one's, ten's, hundred's, and thousand's.

Material: Number cards

Duration: 40 minutes

Activity:

1. The facilitator divides the class into groups and gives them the number cards then the facilitator tells the learners to show the numbers which written in the cards by the beans and stones they have.



2. The facilitator will introduces a game to the learners and instruct 3 learners to stand in front of the class then name each one's, ten's, hundred's and when the facilitator writes 235 on the board the learner in one's shows her five fingers, the learner stand in ten's shows her three and the one in hundred's shows her two fingers, each learners raises her finger according to the numbers.
3. The facilitator divides the class into groups and writes the numbers on the board, then asks each group to shows the numbers by the beans or stones they have according the classification/grading.
4. To evaluate the learners, the facilitator tells the learners a few numbers and the learners show the numbers by the beans and stones they have and put them in classification/grading order. The facilitator checks the learners and helps them if they have any problem.
5. The facilitator writes a few numbers on the board and tells the learners to write the numbers in classification/grading order at home in their notebooks.

Milestone 7**Activity 2: Fractions and the Comparison of Fractions**

Objective: In this activity the learners will learn the usage of the fractions in their daily life and they will have the ability to show the usage practically.

Material: Flipchart, fractional numbers cards, apple, pen, notebook, board and chalk

Duration: 40 minutes

Activity:

1. The facilitator writes a few fractional numbers on the cards for example:

$1/4$ $5/8$ $3/10$ $1/6$

2. Then the facilitator divides the class in to groups and distributed the cards, apples to the each group then tells them to cut the apple according to the fractional number on the cards. For example first group divides the apple into four parts and takes one part/cut, the second group divides the apple into eight parts and takes five parts. In this way, the facilitator evaluates the process and if the learners have any problems the facilitator solve their problems.

3. Now the learners compare their apple pieces with the other groups' apples pieces to see which are bigger and which ones are smaller.

For example:

$1/10 < 1/8 < 1/6 < 1/4$

In this way, $1/4$ is bigger than $1/10$. Now the facilitator asks all groups why the cuts/slices of the apples are different in size? The facilitator will collect the answers of the learners and add some more information on the subject.

For example: We divided an apple into four slices, therefore the slices are bigger than the apple which we cut into eight slices.

The facilitator tells the learners that the more pieces we slice an apple in to, the smaller will the slices be. If we cut an apple into two parts they will be bigger than if we cut an apple into twenty parts. Therefore we can say that $1/2$ is bigger than $1/20$.

$1/2 > 1/20$

Milestone 7**Activity 3: Introduction of Decimals**

Objective: The learner will learn the significances of decimal fraction and the decimal sign.

Duration: 40 minutes

Activity:

1. The facilitator cuts a tablet into two parts and asks the learners that if we take one parts of this tablet, how can we show it in numbers? The learners will answer the question and the facilitator explains whenever we cut a tablet into two parts it means we divide 1 in 2 and we can write 0.5 it mean we divides $1/2$.
2. The facilitator writes a few fractional numbers on the board then asks the learners to show these numbers in a picture.

$$1/10 \quad 2/10 \quad 3/10 \quad 4/10 \quad 5/10$$

The facilitator explains to the learners if we divide a number into ten parts then take one or a couple of the divided parts we can show it as colored the taken parts as shown in the pictures in this case we can say $2/10$, $1/10$ or $3/10$ and so on.



$$1/10$$



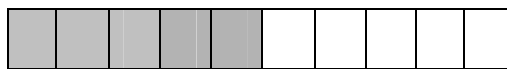
$$2/10$$



$$3/10$$



$$4/10$$



$$5/10$$

3. Now the facilitator draws a picture which some parts are taken and asks the learners to talk about the picture.

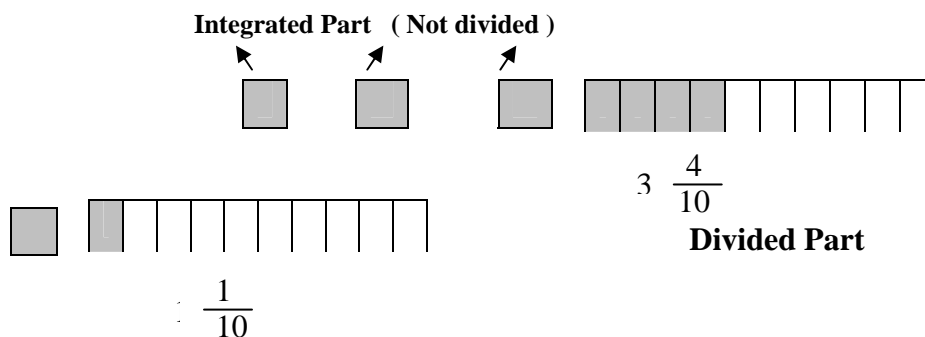
For example: If we divide something into 10 parts and take one or two parts of that, we can write it in decimal numbers as following:

$$1/10 = 0.1 \quad 2/10 = 0.2 \quad 3/10 = 0.3 \quad 4/10 = 0.4$$

The facilitator solves the following mathematical problems/operation:

$\begin{array}{r l} 1 & 10 \\ \hline & \end{array}$	$\begin{array}{r l} 10 & 10 \\ 10 & 0.1 \\ \hline & \end{array}$	OR	$\begin{array}{r l} 2 & 10 \\ \hline & \end{array}$	$\begin{array}{r l} 20 & 10 \\ 20 & 0.2 \\ \hline & \end{array}$
First	Second		First	Second

4. Now the facilitator draws the following pictures in a flipchart and asks the learners to find the different between these pictures and previous mathematical problems/operations. The learners specify the differences and learn the way of writing the numbers in both ways fractional and decimal:



5. At the end the facilitator writes decimal and whole numbers on the board and tells the learners to write them in their notebook and draw the pictures for each number.

$4 \frac{3}{10}$ $2 \frac{6}{10}$ $5 \frac{7}{10}$ $1 \frac{8}{10}$

Milestone 7**Activity 4: Measuring with Centimeters and Millimeters**

Objective: The learners will be able to use the decimal numbers in measuring.

Material: Ruler, pencil and any thing else like rulers which has short lengths

Duration: 40 minutes

Activity:

1. The facilitator divides the learners into couples and tells them to measure their pencil by their rulers and write the number in their notebooks. For more practice, the learners can measure any thing such as their rubbers, mirrors etc in their class and write the numbers in their notebooks.

For example:



3.9

2. The facilitator divides the class into groups. Group A draws different types of triangles and measures the sides. Group B draws circles and measure its radius and diagonals. Group C draws squares, pentagons and hexagons and measures the sides. The learners exchange their drawings and check each other's works. At the end, hang their drawings on the board and talk about them.
3. The facilitator asks two learners to come to the front of the class and measure each others' neck and waist then write the number beside her name in the list.

For example:

waist = 29.15 cm and neck = 13.5 cm

4. After measuring the facilitator divides the class into groups. Group A read the numbers the measured and Group B writes the numbers on the board then group B read the numbers and group A write the numbers on the board. In this way all learners can take a parts in exercise.

Milestone 7

Activity 5: Classification/Grading of Decimal Numbers

Objective: Learners will learn how to write the decimal numbers and put the numbers in a table which show the integrated and decimal figures.

Material: Decimal charts and symbols.

Duration: 40 minutes

Activity:

1. The facilitator asks questions from previous lessons about decimal numbers and the learners answer. Then the facilitator writes some division problems on the board and asks the learners to write the problems in their notebooks and draw pictures for these numbers.
2. Then the facilitator hangs a table which has columns for integrated and decimal numbers and tells the learners to copy it in their notebooks.

Hundred's	Ten's	One's	Decimal point	Tenth's	Hundredth's	Thousandth's

3. The facilitator writes a few decimal numbers on the board and asks the learners to put the numbers on the table in their notebooks.

For example:

2.13 41.524 0.35

Hundred's	Ten's	One's	Decimal point	Ten's	Hundred's	Thousand's
		2	.	1	3	
	4	1	.	5	2	4
		0	.	3	5	

4. The facilitator tells the learners to write the previous numbers as fractions.

$$2.13 = 2 \frac{13}{100}$$

$$0.35 = \frac{35}{100}$$

$$44.524 = 44 \frac{524}{1000}$$

$$36.896 = 36 \frac{896}{1000}$$

5. At the end the facilitator draws two tables as following on a flipchart and hangs it on the board then tells the learners to find the difference between these tables.

Thousand's	Hundred's	Ten's	One's
1	7	2	9
2	8	4	6

Hundred's	Ten's	One's	Decimal point	Ten's	Hundred's	Thousand's
		1	.	5		
	2	3	.	6	1	
4	3	5	.	1	8	2

6. The facilitator shows the difference of both tables such as the first number/ digit after decimal point is tenth's and the number/digit which written before decimal point is a whole number.

Milestone 7**Activity 6: Decimal Point In Three-Digit Numbers**

Objective: The learners will be able to work with bigger decimal numbers.

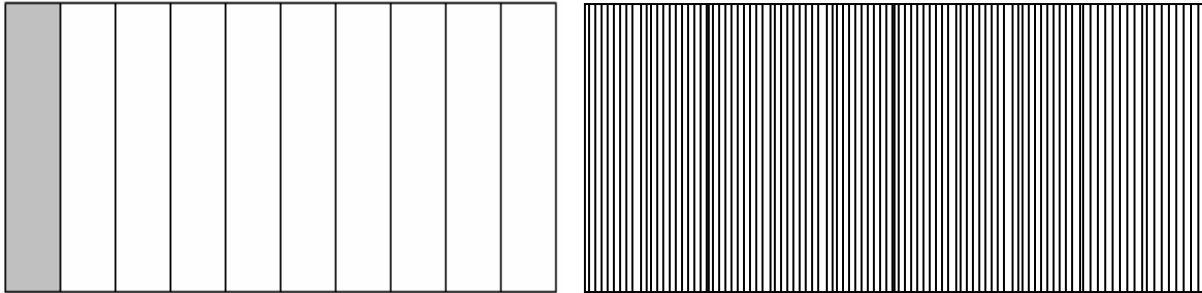
Material: Paper, scissor, notebook, pen, board and chalk

Duration: 40 minutes

Activity:

The learners divide a piece of paper into ten pieces then take each piece and tear it into other ten more pieces. We see that the paper is now torn into 100 pieces. Now the facilitator take one piece of the paper and explains to the learners that it is the $\frac{1}{100}$ piece of the first paper. We can write it as following:

$$\frac{1}{100} = 0.01$$

**0.1****0.01**

Now the facilitator asks the learners which number is bigger 0.1 or 0.01 ($0.1 > 0.01$). The facilitator divides the class into four groups then group A will say a fractional numbers such as $\frac{2}{100}$, $\frac{3}{100}$, $\frac{4}{100}$ and group B will write its decimals on the board such as 0.02, 0.03 and 0.04. This activity also will be done by the piece of papers which the learners cut before. This exercise will continue until all the learners take parts and the facilitator should be sure that all the learners learn the lesson well.

The learners can ask two digits numbers too such as $\frac{12}{100} = 0.12$, $\frac{25}{100} = 0.25$.

Milestone 7

Activity 7: Measuring More Than One Meter

Objective: Learners will be able to measure things, and note the number with it is decimal points.

Material: Notebook, pen and measurement tape.

Duration: 40 minutes

Activity:

1. The facilitator divides the class into groups and each group measures their distance from the board and note the number in their notebooks.
For example: Group A is 2.30 cm far from the board. The same all groups will note their distance from the board and note it. Then they will write the numbers on a flipchart and hang it on the board. They will see that each group is in different distances from the board.
2. For measuring of the learners' height one learner will stand near the wall the other learner will put/hold a ruler on her head and make a sign on the wall then measure the distance form the signed area to the ground by the measuring tape. The measuring number is the height of the learner for example 1.70 cm, 1.80cm, and 1.20 cm here by we can write the numbers in decimal form.
3. The facilitator asks the learners to measure their veils and note the number in their notebooks for example: 1.50cm length and 1.10cm width.

At the end the facilitator will evaluate and help the learners who have problems.