2006

Bridging: Mathematics Facilitator Book Milestones 1-12

Center for International Education School of Education University of Massachusetts, Amherst

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LEARNING FOR LIFE

DRAFT

Bridging Program

Mathematics
Milestones 1-12

English

Facilitator Book 2006
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.

For further information see: www.umass.edu/cie, or contact cie@educ.umass.edu

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Bridging Math

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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 and the Objectives 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, 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.

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:
- Language Milestones 1-7
- Math Milestones 1-8
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.
## MILESTONE 1: LEARNING NUMBERS FROM 1000 TO 100 000

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials/Preparation</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 To Arrange Numbers</td>
<td>Cards of numbers</td>
<td>45 min</td>
</tr>
<tr>
<td>2 Read and Write</td>
<td>paper, pen, board, chalk</td>
<td>45 min</td>
</tr>
<tr>
<td>3 Classification of Numbers</td>
<td>board, chalk</td>
<td>45 min</td>
</tr>
<tr>
<td>4 Abacus</td>
<td>notebooks</td>
<td>45 min</td>
</tr>
<tr>
<td>5 Cards of Numbers</td>
<td>Cards for six digit numbers</td>
<td>45 min</td>
</tr>
<tr>
<td>6 Ordering and Reading of Numbers</td>
<td>Board, chalk</td>
<td>45 min</td>
</tr>
</tbody>
</table>

**EVALUATION ACTIVITIES**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The facilitator reads a number and asks the learners to write it. Likewise, the facilitator can read two numbers for a learner and ask her for a number that comes between these two numbers.</td>
</tr>
<tr>
<td>2</td>
<td>A learner take two cards and must tell which number is bigger, and should read the card which she takes and should write the place value classifications of the number which she picked up.</td>
</tr>
</tbody>
</table>

## MILESTONE 2: ADDITION AND SUBTRACTION OF TWO AND THREE DIGIT NUMBERS

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials/Preparation</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Adding</td>
<td>Learner book</td>
<td>45 min</td>
</tr>
<tr>
<td>2 Counting</td>
<td>pen, notebook, board, learner book</td>
<td>45 min</td>
</tr>
<tr>
<td>3 Play With Money</td>
<td>paper money, pen, notebook, board, chalk and photocopies of fake money</td>
<td>45 min</td>
</tr>
<tr>
<td>4 Play with Nine-Digits Table</td>
<td>Cards of three-digit numbers, notebook, pen</td>
<td>45 min</td>
</tr>
<tr>
<td>5 Buying Within One's Means</td>
<td>Notebook, learner book</td>
<td>45 min</td>
</tr>
<tr>
<td>6 Estimating</td>
<td>pen, notebook, board and chalk</td>
<td>45 min</td>
</tr>
</tbody>
</table>

**EVALUATION ACTIVITIES**

<table>
<thead>
<tr>
<th>Activity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The facilitator writes different questions on cards (see below), puts all these cards in a box or a basket then place them before learners. When evaluating a learner she asks a person to pick up a card and gives answer as per the instruction written in it. Example: Sharifa has purchased chloramphenicol for 178 Afghanis and sedative tablets for 215 Afghanis. Find out how much money has Sharifa spent.</td>
</tr>
</tbody>
</table>
### MILESTONE 3:
**MULTIPLICATION AND DIVISION (UP TO 2 DIGITS)**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials/Preparation</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Review of Multiplication Facts, Games, and Patterns of Multiplication</td>
<td>sets of number cards from 0 to 12</td>
<td>45 min</td>
</tr>
<tr>
<td>2 Review of Division Facts – Perfect, and With Remainders</td>
<td>Learner book</td>
<td>45 min</td>
</tr>
<tr>
<td>3 Multiplying by 10 and 100</td>
<td>notebooks, chalkboard</td>
<td>45 min</td>
</tr>
<tr>
<td>4 Multiplying by 100 and by Multiples of 100</td>
<td>100’s and 1’s number cards</td>
<td>45 min</td>
</tr>
<tr>
<td>5 One-Digit Multiplication with No Carryover</td>
<td>several digit cards of 1,2, 3; number cards: 12, 14, 13, 21, 22, 23, 11, 10, 20, multiplication symbol card X</td>
<td>45 min</td>
</tr>
<tr>
<td>6 One-Digit Multiplication With Carry-Over</td>
<td>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</td>
<td>45 min</td>
</tr>
<tr>
<td>7 Two-Digit Multiplication</td>
<td></td>
<td>45 min</td>
</tr>
<tr>
<td>8 Review of 1-Digit Divisor Problems, With and Without Remainder</td>
<td>digit cards of 2, 4, 3-digit number cards such as 328, etc,</td>
<td>45 min</td>
</tr>
</tbody>
</table>

**EVALUATION ACTIVITIES**

1. The Learners must solve a 2-digit multiplication problem, such as $34 \times 25 = ?$

2. The Learners must solve the following story problem: 5 friends want to share the cost of a taxi to the city. The taxi costs 845 Afs. How much must each person pay?

### MILESTONE 4:
**MEASUREMENT OF LENGTH-WHOLE NUMBERS**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials/Preparation</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Standard Measurement System, Size of a centimeter, and Measuring Various Objects (Whole Number Measurements), Rounding-Applications</td>
<td>tape measure</td>
<td>45 min</td>
</tr>
<tr>
<td>2 Size of a Meter</td>
<td>tape measure</td>
<td>45 min</td>
</tr>
<tr>
<td>3 Size of a Kilometer</td>
<td>a map, a ruler or tape measure</td>
<td>45 min</td>
</tr>
<tr>
<td>4 Applications, Practice, and Estimation of Measurement</td>
<td>tape measures</td>
<td>45 min</td>
</tr>
<tr>
<td>5 Extra Activity: Estimation of Measurements: What do we do when we don’t have a tape measure?</td>
<td>tape measure</td>
<td>45 min</td>
</tr>
</tbody>
</table>

**EVALUATION ACTIVITIES**

1. The Learner must measure the height of one friend in the classroom.

2. She must also measure the upper arm of one friend in the classroom.
### MILESTONE 5: WEIGHT AND VOLUME

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials/Preparation</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 To Weigh</td>
<td>board, chalk, notebook, pen, flipchart, bags of different materials with a weight of one kilogram and paper clips</td>
<td>45 min</td>
</tr>
<tr>
<td>2 To Know Gram</td>
<td>A bag of rice weighing one kilogram</td>
<td>45 min</td>
</tr>
<tr>
<td>3 To Know Units</td>
<td>notebook and pen</td>
<td>45 min</td>
</tr>
<tr>
<td>4 To Answer the Questions</td>
<td>Cards</td>
<td>45 min</td>
</tr>
<tr>
<td>5 To Estimate</td>
<td>pen, notebook, board, chalk</td>
<td>45 min</td>
</tr>
<tr>
<td>6 Measurement of Liquids</td>
<td>glass, bucket, jug or bottle, notebook and pen</td>
<td>45 min</td>
</tr>
<tr>
<td>7 To Know Milliliter</td>
<td>tablets, capsules, empty bottles of serum, syringes, ampoules and teaspoon.</td>
<td>45 min</td>
</tr>
<tr>
<td>8 To Become Acquainted With a Small Quantity Such as Milliliter</td>
<td>bottles of syrup</td>
<td>45 min</td>
</tr>
</tbody>
</table>

**EVALUATION ACTIVITIES**

1 Examples questions:  
   1- How many milliliters are equal to one liter?  
   2- Which unit are liquids measured with?  
   3- Why is it important to know and take into consideration measurement units?

---

### MILESTONE 6: SIMPLE FRACTIONS

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials/Preparation</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Introduction of Fractions</td>
<td>a sheet of paper, pen, ruler, or measurement ribbon.</td>
<td>45 min</td>
</tr>
<tr>
<td>2 To Understand Fractions from Pictures</td>
<td>pictures, different figures, board, chalk, notebook, pen and the learners’ book</td>
<td>45 min</td>
</tr>
<tr>
<td>3 The Concept of Fraction</td>
<td>A round loaf of bread</td>
<td>45 min</td>
</tr>
<tr>
<td>4 Demonstrating Fractions</td>
<td>empty bottle of Coke or Fanta, glass, board, chalk and learners’ book</td>
<td>45 min</td>
</tr>
<tr>
<td>5 Arrangement and Comparison of Fractions</td>
<td>Cards of fractional numbers, apple, pen, notebook, board and chalk.</td>
<td>45 min</td>
</tr>
<tr>
<td>6 Estimation of Fractions</td>
<td>glass or some other container being available, water, notebook, pen, board and chalk</td>
<td>45 min</td>
</tr>
</tbody>
</table>

**EVALUATION ACTIVITIES**

1 The facilitator will write different fractional numbers on small pieces of paper and then the learners should show this fractional number.
### MILESTONE 7: BASIC PERCENT

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials/Preparation</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Understanding and Applying Percents</td>
<td>notebooks</td>
<td>45 min</td>
</tr>
<tr>
<td>2 To Recognize Fractions and Identify Percents</td>
<td>notebook, pen, class-board, chalk</td>
<td>45 min</td>
</tr>
<tr>
<td>3 Applying Percent and Learning More About It</td>
<td>notebook, pen, glass-board, and chalk</td>
<td>45 min</td>
</tr>
<tr>
<td>4 More About Percent</td>
<td></td>
<td>45 min</td>
</tr>
<tr>
<td>5 Applying Percent with Word Problems</td>
<td>class-board, chalk, notebook, and pen</td>
<td>45 min</td>
</tr>
</tbody>
</table>

**EVALUATION ACTIVITIES**

1 Asking questions of each other.

### MILESTONE 8: 1-2 DIGIT DIVISION, AVERAGING, Rounding, AND RECOGNIZING MILLIONS

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials/Preparation</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Reading and Writing Millions</td>
<td>notebook, pen, class-board, chalk</td>
<td>45 min</td>
</tr>
<tr>
<td>2 Division</td>
<td></td>
<td>45 min</td>
</tr>
<tr>
<td>3 Two – Digit Division</td>
<td>flipchart, notebook, pen, class-board and chalk</td>
<td>45 min</td>
</tr>
<tr>
<td>4 Taking an Average</td>
<td>measuring tape, ruler, notebook, class-board, and pen</td>
<td>45 min</td>
</tr>
<tr>
<td>5 Rounding</td>
<td>class-board, chalk, notebook, pen and number cards</td>
<td>45 min</td>
</tr>
<tr>
<td>6 Taking Average in Story Problems</td>
<td>pen, notebook, class-board and chalk</td>
<td>45 min</td>
</tr>
</tbody>
</table>

**EVALUATION ACTIVITIES**

1 Cards with numbers written on them should be read.
### MILESTONE 9: RATIOS

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials/Preparation</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Ratio Introduction</td>
<td>string, notebook, chalk and class-board</td>
<td>45 min</td>
</tr>
<tr>
<td>2 Presenting Ratios in a Graph</td>
<td>pen, notebook, measuring tape, chalk and class-board</td>
<td>45 min</td>
</tr>
<tr>
<td>3 Writing Ratios</td>
<td>Picture, notebook, pen, class-board, chalk and other</td>
<td>45 min</td>
</tr>
<tr>
<td>4 Word Problems</td>
<td>class-board, chalk, notebook and pen</td>
<td>45 min</td>
</tr>
<tr>
<td>5 Ratio Relation with Fractions</td>
<td>pen, notebook, class-board, chalk, learner book (MS 6)</td>
<td>45 min</td>
</tr>
<tr>
<td>6 More About Ratio</td>
<td>class-board, chalk, notebook and pen</td>
<td>45 min</td>
</tr>
</tbody>
</table>

**EVALUATION ACTIVITIES**

1. The Facilitator should select two learners to measure each other’s height find out the ratio and record them on the class-board. Or they can find ratio of height to waist, rice to water for cooking, and so on.

2. Find out how much beef, rice, cabbage and vegetable you need for a month and show their ratio in a chart.

3. Find out the ratio of given diagram charts.

### MILESTONE 10: DECIMALS

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials/Preparation</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Fractions and How to Write Numbers Smaller Than One</td>
<td>Paper, notebook, pen, chalk and class-board</td>
<td>45 min</td>
</tr>
<tr>
<td>2 Fraction Introduction</td>
<td></td>
<td>45 min</td>
</tr>
<tr>
<td>3 To Recognize Decimals</td>
<td></td>
<td>45 min</td>
</tr>
<tr>
<td>4 Measurement with Centimeter and Millimeter</td>
<td>ruler, pencil, some objects</td>
<td>45 min</td>
</tr>
<tr>
<td>5 Three-Digit Decimal Numbers</td>
<td>Paper, scissor, notebook, pen, class-board and chalk</td>
<td>45 min</td>
</tr>
<tr>
<td>6 Addition of Decimal Numbers.</td>
<td>class-board, chalk, notebook and pen</td>
<td>45 min</td>
</tr>
<tr>
<td>7 Decimal Multiplication</td>
<td>class-board, chalk, notebook and pen</td>
<td>45 min</td>
</tr>
</tbody>
</table>

**EVALUATION ACTIVITIES**

1. The Facilitator should ask each learner to divide a paper into 10 equal pieces and write the fraction in their notebook.

2. The Facilitator should write the following question on several pieces of paper and let each learner pick one and explain it. Examples: 0.2, 0.02, 1/25, 1/10>2/10, 0.7, 4/10, 19/12 and so on.
### MILESTONE 11:
#### ADVANCED MEASUREMENT

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials/Preparation</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Measuring Temperature with a Thermometer</td>
<td>thermometer, the learners’ books, pen, board and chalk</td>
<td>45 min</td>
</tr>
<tr>
<td>2 Measurement of Longer Distances</td>
<td>board, chalk, pen and note books</td>
<td>45 min</td>
</tr>
<tr>
<td>3 The Relationship Between Measurement of Distance and Time</td>
<td>board, chalk and the learners’ note books</td>
<td>45 min</td>
</tr>
<tr>
<td>4 Measurement of Weight</td>
<td></td>
<td>45 min</td>
</tr>
<tr>
<td>5 Measuring for the Carpet of a Room</td>
<td></td>
<td>45 min</td>
</tr>
<tr>
<td>6 Our Body’s Need For Water</td>
<td></td>
<td>45 min</td>
</tr>
</tbody>
</table>

#### EVALUATION ACTIVITIES

1. What is a thermometer and what is it made of, how does it work?
2. When a person has a fever, what will be the degree of her/ his temperature?
3. Can we measure the distance by hour? Give an example.
4. List the foods which you usually eat during pregnancy and the foods which you eat rarely during your pregnancy. If it is difficult to show this by a graph of percentage, write about the food which you use usually.
5. How do we measure the carpet/rug of a room?

### MILESTONE 12:
#### TIME AND CALENDAR

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials/Preparation</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Recognizing the Date from the Calendar</td>
<td>Calendar, chalk and board</td>
<td>45 min</td>
</tr>
<tr>
<td>2 Introducing the Year, Month and Day</td>
<td>calendar, notebook, pen, board and chalk</td>
<td>45 min</td>
</tr>
<tr>
<td>3 Discovering the Calendar and Counting Months and Days</td>
<td>calendar, board, chalk</td>
<td>45 min</td>
</tr>
</tbody>
</table>

#### EVALUATION ACTIVITIES

1. Sample of the Questions to be asked of the learners:
   1. How many hours is a day and night?
   2. How many days is a week?
   3. How many weeks is a month?
MILESTONE 1: LEARNING NUMBERS FROM 1000 TO 100 000

Objectives:
- Reading and writing of numbers up to 1000
- Counting of numbers from 10 000 to 90 000

Description of the Milestone:
The aim of this milestone is to enable the learners to use large numbers in their daily life practically, such as reading and writing numbers, determining amount and size and counting money. If the learners’ level of knowledge is low, facilitator can start counting from a level lower than this milestone.
Milestone 1
Activity 1: To Arrange Numbers

Objective:
- Learners should put numbers in order.
- Learners read six digits numbers

Materials: Cards of numbers

Activity:
Write different four-digit numbers on small sheets of paper.

Place the cards out of order in front of learners and tell a learner to quickly pick 6 cards from the desk.

The learner must then quickly put the cards in order from smallest to largest.

In the same manner, the next learner comes does the same thing with 6 cards. This continues to the last learner.

Example of cards:

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9988</td>
<td>5900</td>
<td>1949</td>
<td>4837</td>
<td>6742</td>
<td>4712</td>
<td>5835</td>
</tr>
<tr>
<td>2222</td>
<td>1412</td>
<td>2418</td>
<td>7890</td>
<td>5420</td>
<td>1234</td>
<td>3872</td>
</tr>
<tr>
<td>3212</td>
<td>3215</td>
<td>9876</td>
<td>1945</td>
<td>1004</td>
<td>1947</td>
<td>5839</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For example the first person selects as follows:

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1234</td>
<td>4712</td>
<td>6742</td>
<td>1004</td>
<td>5900</td>
<td>2837</td>
</tr>
</tbody>
</table>

And the learner puts the cards in order as follows:

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1004</td>
<td>First</td>
<td>(smallest)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1234</td>
<td>Second</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2837</td>
<td>Third</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4712</td>
<td>Fourth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5900</td>
<td>Fifth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6742</td>
<td>Sixth</td>
<td>(largest)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Milestone 1  
Activity 2: Read and Write

Objectives:
- Learners will be able to write four digit numbers
- Learners will be able to read large numbers correctly

Materials: paper, pen, board, chalk

Activity:
Facilitator writes down different numbers on sheets of paper and place these sheets upside-down in front of learners and ask each one to take a sheet and then write that number in words on the board.

So that everyone takes part in the activity, the learners should sit in a circle. When the first person has taken one card and written the number in words on the board, the second and third learners come in turn. When all have taken part, the first learner starts again and takes another card.

Example:

<table>
<thead>
<tr>
<th>Number</th>
<th>Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>8049</td>
<td>Three thousand twenty nine</td>
</tr>
<tr>
<td>1111</td>
<td>Ten thousand one hundred eleven</td>
</tr>
<tr>
<td>3029</td>
<td>Eight hundred thousand forty nine</td>
</tr>
<tr>
<td>1350</td>
<td>Five thousand four hundred twenty</td>
</tr>
<tr>
<td>5420</td>
<td>One thousand three hundred fifty</td>
</tr>
</tbody>
</table>

Note: Facilitator can give assignments to learners to write the cards and they discuss among themselves and write down numbers of the first activity in words.
Milestone 1,  
Activity 3: Classification of Numbers

Objective:
- Learners will be able to read and write numbers correctly, and use counting in their daily life without mistakes.

Materials: board, chalk

Activity:
1. The facilitator draws a table of place values on the board, and writes some single-digit numbers from 0 to 9 underneath the table.

2. Ask each learner to choose from these numbers and write them in places in the table to arrange a four-digit or five-digit number. Then read the obtained number aloud. Facilitator can ask other learners to choose numbers and tell someone to write them down and then read them. However, repeated numbers should not be written.

Example:

<table>
<thead>
<tr>
<th>Ten thousands</th>
<th>thousands</th>
<th>hundred</th>
<th>tens</th>
<th>ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>7</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>5</td>
<td>9</td>
<td>0</td>
</tr>
</tbody>
</table>

1st person
2nd person
3rd person
4th person

Use the given numbers: 6, 5, 4, 3, 2, 1, 0 to form numbers in the place value table.

And then read the numbers:

Seven thousand six hundred forty three
Fifty eight thousand two hundred nineteen
Six thousand three hundred seventy
Fourteen thousand five hundred ninety
Milestone 1
Activity 4: Abacus

Objectives: Learners will be able to represent numbers physically and on a place value classification table

Activity:
The Facilitator reads different six digits numbers to learners and asks them to show the numbers on the abacus on the board. If learners are not able to show those numbers correctly, the Facilitator guides it as follows:

Example: 167 548

When all learners have practiced this activity, the Facilitator draws the place value table on the other side of the board and asks learners to write down the number shown on the abacus in the place value table as well. Of course, for the guidance of learners, the facilitator herself writes one or two numbers on the table. Then tell learners to write different numbers both on the table and abacus.
When a table is arranged with many numbers, the facilitator asks each learner to read a number from the table. If they make any mistakes in the reading of numbers, the other learners or facilitator should correct it.

<table>
<thead>
<tr>
<th>Second category</th>
<th>First category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hundred</td>
<td>1 6 7 5 4 8</td>
</tr>
<tr>
<td>thousands</td>
<td>8 7 5 3 4 9</td>
</tr>
<tr>
<td>Ten</td>
<td>3 2 1 4 5 6</td>
</tr>
<tr>
<td>thousands</td>
<td>6 7 8 9 0 1</td>
</tr>
<tr>
<td>thousands</td>
<td>1</td>
</tr>
</tbody>
</table>
Milestone 1
Activity 5: Cards of Numbers

Objective: Learners to arrange and understand smaller and bigger numbers.
Materials: Cards for six digit numbers.

Activity:
1. The facilitator write down different six digit numbers on separate pieces of paper and then distributes these papers randomly to all learners.

2. Now the group of learners must organize themselves to stand in order from the smallest number to the largest number, and do this as quickly as possible. If anyone makes a mistake in finding her place or does not find her place is the loser.

3. After the line has been established, in order to check for the accuracy of the order of the value of the numbers, each one standing in queue in her place should hold her number high so that the others can also see.

4. After this activity, the facilitator recollects the sheets of numbers and mixes them up. Now divide the learners into two groups and give half of the cards to each group so that the first group shows one card to someone from the second group to quickly read it. Then the second group shows one card to a learner from the first group to read it.
Milestone 1
Activity 6: Ordering and Reading of Numbers

Objective: Learners will be able to write six digits numbers, count and read them and make use of them in daily life.
Materials: Board, chalk

Activity:
1. The facilitator writes down a four digit number on the board, e.g. 1999, then asks learners how much is this? And learners give reply one thousand nine hundred ninety nine. Now the Facilitator asks someone to add a zero to this number and read it aloud: 19990, or nineteen thousand nine hundred ninety. In this manner, she wants another learner to add one more zero to this number 199900: one hundred ninety nine thousand nine hundred.

2. Now, the facilitator divides the class into groups and they conduct the above activity in a competitive manner as such that one group reads a four digit number and then one person from the other group writes it on the board. Then second person comes and add a zero to it and reads the new number. After that third person comes and add another zero and read that new number.

When this activity is completed, this group gives questions to the opposite group. This activity will continue until all learners have taken part.

3. A group writes down a six digit number on the board and the members of the other group make other numbers from that first number. They must write them on the board and read them aloud.

For example: From the number 458262 several other numbers can be made such as 262854, 628254, 458262, etc.
EVALUATION ACTIVITIES FOR MILESTONE 1

Evaluation Activity 1:
The facilitator reads a number and asks the learners to write it. Likewise, the facilitator can read two numbers for a learner and ask her for a number that comes between these two numbers.

Evaluation Activity 2:
Materials: number cards used in the activities
A learner take two cards and must tell which number is bigger, and should read the card which she takes and should write the place value classifications of the number which she picked up.
MILESTONE 2:
ADDITION AND SUBTRACTION OF TWO AND THREE DIGIT NUMBERS

Description of the Milestone:
To enable learners to add and subtract three-digit numbers, and review adding and subtracting with two-digit numbers if they have forgotten. In the same way they should be able to use these operations in their daily calculations of expenses and savings.
Milestone 2  
Activity 1: Adding  

Objective:  
- To recall the simple addition and subtraction operations  
- To enable learners in adding and subtracting of two and three digits numbers  

Activity:  
1. Ask the following question from the learners:  
Sharifa had 20 hens and daily each one laid one egg. She purchased ten more hens from her sister, each of which each one lays an egg daily. Now find out how many eggs does Sharifa obtain from her hens?  

Learners practice this operation in writing in their notebooks. Maybe they will not be able to give a correct answer. The facilitator should ask them to try and to perform the operation properly and find the correct answer. If it is difficult for them, they can get together in pairs and find the correct answer to the question and write it in their notebooks.  

2- Whenever all learners have found the answer, the facilitator then asks a learner to solve it on the board. One person should come and solve the question on the board. The others can take the correct answer from the board if they have made mistake.  

3- Now, the facilitator gives learners another question to be solved:  

Example:  
Nazifa purchased two packets of paracetamol for Afs.28.00, one packet of cotrimoxazole for Afs.97.00, and a roll of plaster for Afs.14.00. Find out how many Afghanis Nazifa has spent.  

If it is difficult to answer the question, the Learners can work in pairs to solve the question.  
If still there is a problem, make a group of four persons to find out the correct answer to the question.  

Whenever learners have found the answer and written it in their notebooks, the facilitator asks who can solve the question on the board. Then one person comes to solve the question on the board and the others correct their answers if they have made any mistake.  

4- Now, the facilitator for the purpose to further practice, puts the learners in pairs. In each pair, one person should make up a question to solve, and the other should solve the problems and give the answer. Then the second makes a question and the first gives answer and in consultation with each others give proper answers to the questions.
Milestone 2
Activity 2: Counting

Objective: Learners will be able to calculate their daily incomes and expenses.

Materials: pen, notebook, board

Activity:
To give more practice with addition and subtraction operations, the facilitator designs a word problem, such as the one below:

Anis Gul purchased a shop in the village for her son so that he could sell things and make a profit. She also took her daughter with her to the shop to make an inventory of the items. Her daughter counted the items being available in the first and second rows of the cupboard and her son wrote the quantity of the items as follows:

<table>
<thead>
<tr>
<th></th>
<th>Pens</th>
<th>Matches</th>
<th>Eggs</th>
</tr>
</thead>
<tbody>
<tr>
<td>First row:</td>
<td>359</td>
<td>175</td>
<td>115</td>
</tr>
<tr>
<td>Second row:</td>
<td>144</td>
<td>255</td>
<td>150</td>
</tr>
</tbody>
</table>

Now, the learners should add the numbers of items written so that Anis Gul understands how many items are available in the rows of the cupboard, and each learner should write down this operation in her notebook.

After all the learners have solved the questions, in order to check their work, the facilitator asks a learner to add the numbers of eggs on the board, another person to add numbers of matches and the thirds person to add numbers of pens so that the rest may correct their mistakes in their notebooks if they have made any. The facilitator should also explain that when adding numbers, we should write them one under the other in the way that the first, second and third numbers come in one row.

Examples:

<table>
<thead>
<tr>
<th>+359</th>
<th>+ 175</th>
<th>+115</th>
</tr>
</thead>
<tbody>
<tr>
<td>144</td>
<td>255</td>
<td>150</td>
</tr>
</tbody>
</table>

| 503    | 412   | 265  |
The next day, Anis Gul again went to the shop and found that her son had sold some of the items. Her daughter suggested counting the available items in the cupboard to know how many items of each kind have remained:

Amount of items remaining:
Pens 350
Matches 250
Eggs 143

Now, the facilitator wants learners to find out how many of each item was sold if their original amounts were:
Pens 503
Matches 412
Eggs 265

The learners write these numbers in their notebooks as follows:
Total number of items: 503 265 412
Remaining: 350 143 250

Here, the facilitator wants learners to perform the subtraction operation in their notebooks to find out the number of item sold in the shop. They should work in groups of 3 to solve the problem.

\[
\begin{array}{ccc}
-503 & -265 & -412 \\
350 & 143 & 250 \\
\hline
153 & 112 & 162 \\
\end{array}
\]

When the solution of this question is completed, one person from each group comes and solves the problem on the board so that the others may also correct their mistakes their notebooks if there are any:
Pens 153  eggs 112  matches 162

Afterwards, the Facilitator should ask the learners to record what they are selling daily such as milk, yogurt, eggs, tailoring product and etc. And then, calculate how much they can earn in a day, in a week and finally how much they can earn in a month.
Milestone 2
Activity 3: Play With Money

Objective:
- Learners will be able to use addition and subtraction operations in counting money.
- Learners to understand what quantity of materials they can buy with the money they have available.

Material: paper money, pen, notebook, board, chalk and photocopies of fake money

Activity:
The facilitator now makes one, two, five, ten, fifty and hundred fake Afghani notes and distributes to the learners so as to count them in different quantities. For performing this activity learners are divided into small groups and the facilitator will ask each group one of the following questions.

For example:

<table>
<thead>
<tr>
<th>Najiba</th>
<th>Parween</th>
<th>Nasima</th>
<th>Mina</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>20</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>100</td>
<td>50</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>20</td>
<td>10</td>
<td>10</td>
<td>2</td>
</tr>
</tbody>
</table>

1. Each person should count how much money she has gotten.

2. If Najiba purchases some items such as vitamin B-complex for Afs.200.00, Chlorine for Afs.35.00, tetracycline for Afs.176.00 and Vitamin B1, B2 and B6 ampoules for Afs.176.00. How much money is left with her?

3. If you add up all the money which Najiba, Parween, Nasima and Mina have, how much will be the total amount?

4. If Parwin borrows Afs.250.00 from Najiba, then how much money will Parween in total, and how much money will remain with Najiba?

After giving answers to these questions, the facilitator gives instruction as follows:

5. All members of the group put together their money and then see which group has more money and which has less. Count the total money of all groups.
Milestone 2  
Activity 4: Play with Nine-Digits Table

**Objective:** Learners will acquire skill in adding different numbers and be able to quickly add three-digit numbers.

**Materials:** Cards of three-digit numbers, notebook, pen

**Activity:**
Divide the learners into pairs and each pair will draw a table of numbers from (1-9).

Place the three-digit number cards before each group. The pairs should throw a stone or a bean on the surface of the table. The person whose stone/bean lands on a bigger number should pick up two cards and add them.

Then the partner takes her turn

Finally, each one should count the totalities of her added numbers. Whichever number is found bigger will be the winner.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>7</td>
<td>2</td>
</tr>
</tbody>
</table>
Milestone 2
Activity 5: Buying Within One’s Means

Objective: Learners will be able to understand their expenses and savings

Activity:

The facilitator tells a story:

Yesterday, I went to bazaar and purchased some of the things which I needed. Now, I want to know that how much money I spent. I purchased antibiotics for 200 Afs, paracetamol for 18 Afghanis, a roll of plaster for 27 Afghanis, 309 Afghanis for a bandage. I also purchased Aspirin for 70 Afghanis

Then I bought three meters of cloth for 125 Afghanis. But when I took it home, my daughter did not like it and I had to return back to the shopkeeper. I had 980 Afs at first., Now, how much money have I spent and how much money do I have left?

Firstly, learners write the question in their notebooks and solve it individually. Then teams of three persons should get together and compare their work and in case of any mistakes, discuss it to find the right answer.

The facilitator want learners to initially give the answer verbally and then one person comes and writes the numbers on the board and another person comes and adds these numbers. Someone else comes and subtracts the price of the cloth from the total of all number. All other learners write the question in their notebooks.

Then the facilitator divides the class into two groups and asks each group to design such word problems. Then the other group should answer. If there is a mistake in the answer, they will lose one point and if they cannot make a proper question also they will lose one score.

This activity is performed in a competitive manner, and speed should also be taken into consideration.
Milestone 2
Activity 6: Estimating

Objective:
- Learners learn how to list their equipments and estimate the cost for it.
- Use addition and subtraction operation in estimation.

Materials: pen, notebook, board and chalk

Activity:

1- The facilitator addressing the learners tells them that Fatima has built a nice house. You can help her in listing things needed for the house.

2- The facilitator divides learners into three groups and gives each group a separate assignment.

First Group: Make an estimation cost for building a room for guests. The room should be 6 x 4 m and with two entrance doors and three windows.

Second Group: To make a list all utensils needed for the kitchen and write their prices.

Third Group: To make a list of equipments for the bedroom along with the prices.

3- Now, each group adds the prices of its items.

4- The facilitator gives information that the money which Fatima had allocated for her house was 99990.00.Afghanis.

5- The facilitator asks one of the learners to add all the estimated money and then asks another learner to subtract the estimated money from the money available to Fatima.

6- The facilitator should ask, “Can we purchase all the necessary things with the estimated amount of money or not? If we can not, what should be done and if all the items were purchased, then how much will be the amount of remaining money? Make a calculation.”
EVALUATION ACTIVITY FOR MILESTONE 2:

Activity:
The facilitator writes different questions on cards (see below), puts all these cards in a box or a basket then place them before learners. When evaluating a learner she asks a person to pick up a card and gives answer as per the instruction written in it.

Note: The facilitator writes different three digits addition and subtraction questions.

Example questions:

\[
\begin{array}{c}
-876 \\
654 \\
\hline
\end{array}
\quad
\begin{array}{c}
+967 \\
756 \\
\hline
\end{array}
\]

Sharifa has purchased chloromphenicol for 178 Afghanis and sedative tablets for 215 Afghanis. Find out how much money has Sharifa spent.

Dr. Sohaila visits 240 patients in six days. However, next week she is going to examine only 170 patients. How many patients of hers should be examined the next week?
MILESTONE 3: MULTIPLICATION AND DIVISION (UP TO 2 DIGITS)

Objectives: The learners will review and enhance their skills in knowing:
- Times tables up to 12’s, review of division facts
- Powers of 10 – multiplication and division by powers of 10
- 2-digit multipliers with and without carryover
- Division of a large dividend by 1-digit divisor

Description of the Unit:
This unit will provide a review of multiplication and division concepts and facts. It begins with 1-digit multiplication and division, and then introduces the rule for multiplying by factors of 10 and 100. This prepares the Learners for 2-digit multiplication. The Learners practice 1 and 2-digit multiplication, learning the proper and correct way to write and solve the problems. The last activity provides review of long division problems with 1-digit divisor.

The workbook provides practice with each kind of problem, but also gives story problems so that the Learners can apply the methods they have learned to real-life situations.
Milestone 3  
Activity 1: Review of Multiplication Facts, Games, and Patterns 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 x 4 and ask what it means – NOT what the answer is, but what it means to multiply. For example, 3 x 4 means 3+3+3+3, or adding 3 four times. 7 x 5 means 7+7+7+7+7. 10 x 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 5x6 means, and what the answer is.

3. Now the learners should find the empty multiplication table in their workbooks. The Learners 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. The Learners may not know the facts for the 11’s and the 12’s. If not, the Facilitator can tell them and they must fill in those rows on their chart as well.
5. **NOTE:** This chart will be a reference for the Learners, in case they cannot quickly remember their multiplication facts.

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

**Part 2**
Once the learners have completed their chart, they can form groups or pairs and play games to review and practice their memorization:

1. 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.
2. A multiplication sign (X) should be placed on the table as well.
3. 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.
4. 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.
5. 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 3
Activity 2: Review of Division Facts – Perfect, and With Remainders

Workbook: practice division word problems with and without remainders

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 5 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 5x6 = 30, and 30÷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÷9, 64÷8, 48÷6, 35÷7, etc.)

**NOTE**: To use the multiplication chart, for example to solve 72÷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÷9 is exactly 8, with nothing left over. Now ask the Learners, what about 73÷9? Is there an answer? Since 73 is a little more than 72, and 72÷9=8, the answer is 8 and some left over (remainder), or a little more than 8.

How much is left over? 73÷9 = 8 and 1 remainder. Since 9x8=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÷9=? Since 9x5=45 is closest to 48, then 48÷9=5 with a remainder. The remainder is found from 48-45 = 3. So 48÷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÷8=?, 57÷7 = ?, 24÷3=?, 19÷6=?, 65÷8=?, 52÷5=? Etc.

8. The Learners should work with a partner to solve the Milestone 3 Activity 2 problems in the workbook.
Milestone 3  
**Activity 3: Multiplying by 10 and 100**

**Materials**: notebooks, chalkboard

**Activity**:

**X 10**

1. The Facilitator asks the Learners a series of problems: What is 5x10? 11x10? 2x10? 8x10? 12x10? 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:
   - 5x10 = 50
   - 11x10 = 110
   - 2x10 = 20
   - 8x10 = 80
   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 8x10, 8 is in the ones khane. 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 khane. This is the purpose of the added zero: to shift the numbers one khane.
5. This rule applies to any number multiplied by 10: 25x10 = 250, 36x10 = 360. 497x10 = 4970.
6. The Facilitator should give some more examples to the Learners to make sure they understand, and then ask them what 70x10 would be? Or 400x10?

**X multiples of 10**

7. The Facilitator asks the Learners to figure out a quick way to solve the problem 50x7, 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 50x7 is the same as 5x7, x10. Since 5x7 = 35, then 35x10 = 350. This works because 50 is 5x10. In other words, multiply the digits first (like 5x7) and then add a 0 to that number. EXAMPLE: 20 x 7 → First multiply the numbers 2x7 = 14. Now add a 0: 140. SO 20 x 7 = 140.
9. She should give them a number of other sample problems to solve such as 40x8, 60x3, 70x7, 9x20, 4x30, etc.
Milestone 3  
Activity 4: Multiplying by 100 and by Multiples of 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 7x100? Or 12x100?
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 8x100=? 75x100=? 322x100=?
3. She can then ask them to figure out how to solve problems such as 400x7=?, 800x3=?, 4x400=? They should use the same method as when they learned 50x7, but here instead of adding one 0, they will add two 0’s: 600 x 3 = 1800  
   (400x7=2800, 800x3=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 3
Activity 5: One-Digit Multiplication with No Carryover

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

**Workbook:** multiplication practice problems with no carry over

**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:  
   
   \[
   \begin{array}{c}
   43 \\
   \times 2 \\
   \end{array}
   \]
   
   First, multiply 3x2 = 6 and write below.
   Then multiply 4x2=8 and write below.

   \[
   \begin{array}{c}
   \hline
   \end{array}
   \]
   
   8 6

   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.

   \[
   \begin{array}{c}
   23 \\
   \times 2 \\
   \end{array}
   \]

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 5 problems in this way to practice and review their multiplication skills.
Milestone 3
Activity 6: One-Digit Multiplication 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
Workbook: practice problems

Activity:
1. First, the Facilitator reviews the steps in solving a multiplication problems that have carryover, demonstrating a sample problem such as 54 x 7.
2. The Facilitator should carefully show the steps in solving a problem. The Facilitator should again stress the correct alignment of the numbers:

<table>
<thead>
<tr>
<th>5 4</th>
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<tbody>
<tr>
<td>x 7</td>
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<tr>
<td>8 1</td>
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</table>

1. Multiplying the ones numbers, 4x7=28. Since this is more than 9, we must carry over.
2. We will carry over the tens number, the 2, and write the ones number below: the 8.

<table>
<thead>
<tr>
<th>5 4</th>
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<tbody>
<tr>
<td>x 7</td>
</tr>
<tr>
<td>3 7 8</td>
</tr>
</tbody>
</table>

3. Now we multiply the tens number: 5x7=35. And we add the 2 tens we carried over: 35 + 2 = 37
4. We write the 3 and 7 in the next two positions for the answer 378.

<table>
<thead>
<tr>
<th>4 7</th>
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<tbody>
<tr>
<td>X 5</td>
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NOTE: Solving these problems requires knowing all the multiplication facts, so the Learners should have their multiplication charts ready to use.

3. 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.
4. They take one number card and one digit card, turn them over, and form a vertical multiplication problem with the cards →

5. 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.
6. Learners working in groups or pairs should work separately and then compare and check their answers with each other.
7. This can also be done as a game, trying to solve the problem as fast as possible.
8. After the problem is solved, the cards are removed and another 2 cards are drawn from the stacks.
9. This should be done several times to give the Learners practice with a variety of numbers.
Milestone 3  
Activity 7: Two-Digit Multiplication  
Workbook: practice problems

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

```
  4 5  
X 2 7
 3 1 5
```

Part 1: 45 x 7  
1. Starting with the ones, multiply 5x7 = 35. 35=30 and 5.  
2. Write the 5 in the ones place and carry the 3 above the 4.  
3. Multiply 4x7 and add the 3 carried over: 4x7=28, +3=31. Write the 1 and then the 3 in the correct columns.

```
  3
 4 5  
X 2 7
 3 1 5
```

Part 2: 45 x 20  
1. This step is 45 x20, which means we must first add a 0 according to the rule. This is written underneath in the one’s column.

```
  1
 4 5  
X 2 7
 3 1 5
 0 0
```

2. Now we continue multiplying by the 2 in the tens place:  
3. 5x2=10, write the 0 in the next space below and carry the 1.

```
  1
 4 5  
X 2 7
 3 1 5
 0 0
```

4. Multiply the 4x2 and add the 1 carried over:  
4x2=8, +1 = 9. Write the 9 in the next space. (the 100’s khane  
5. The last step is to add the two lines, starting with the one’s: 5+0=5, 1+0-1, 3+9=12.

```
  1
 4 5  
X 2 7
 3 1 5
 9 0 0
 1 2 1 5
```

4. 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. (see below)
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.

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<tbody>
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<td>49</td>
<td>22</td>
</tr>
<tr>
<td>34</td>
<td>25</td>
<td>37</td>
</tr>
<tr>
<td>67</td>
<td>82</td>
<td>53</td>
</tr>
</tbody>
</table>
Milestone 3
Activity 8: Review of 1-Digit Divisor Problems, With and Without Remainder

Materials: digit cards of 2, 4, 3-digit number cards such as 328, etc,
Workbook: practice problems in gradations of difficulty

Activity:
1. First, the Facilitator reviews how to solve long division problems with no remainder. A sample problem could be “The Women’s Group had 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 ÷ 2 = ?, 635 ÷ 5 = ?, 464 ÷ 4 = ?
4. The Learners should practice solving problems in their workbook, 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.
5. The Facilitator can also show the Learners how to check their work by multiplying. For example, 328 ÷ 2 = ?. The answer is 164. To check, multiply 164 x 2 and make sure it is 328.
6. After the Learners have practiced, they should then continue on to solving division problems with a remainder. The Facilitator should show a sample problem, for example: a group of 3 kids want to buy a bicycle. The bicycle costs 3570 Afs. How much will they each have to pay, and how much will be left?
EVALUATION ACTIVITIES FOR MILESTONE 3

1. The Learners must solve a 2-digit multiplication problem, such as 34 x 25=?

2. The Learners must solve the following story problem: 5 friends want to share the cost of a taxi to the city. The taxi costs 845 Afs. How much must each person pay?

Criteria: 3 or less mistakes in solving each problem
MILESTONE 4: MEASUREMENT OF LENGTH-WHOLE NUMBERS

Objectives: Learners will learn about:
- Metric system length units
- Converting between units
- Using tape measure
- Measuring / recording lengths
- Estimating lengths, distances

Description of the Milestone:
In this unit the Learners will learn about the methods and the standard metric units for measuring length. They will practice using a tape measure to measure things with the correct measurement unit (cm, meter), and will learn uses of measurement in health.
Milestone 4

Activity 1: Standard Measurement System, Size of a centimeter, and Measuring Various Objects (Whole Number Measurements), Rounding-Applications

Materials: tape measure

Activity:

1. The Facilitator asks each person in the group to measure the length of a straight object, like a table or desk, using handspans (each Learner counts how ‘hands’ it takes her to measure the object).

2. One Learner writes each person’s name on the board, and the result of her measurement (should be in a table format of recording data. The Facilitator may need to start by showing how to organize the ‘data’.)

3. After all have measured in handspans, they should discuss what they notice about the measurements, and why all the measurements are different if it was the same object that everyone measured. How can an object have different lengths?

4. The explanation: Since everyone’s hands and bodies are different size, it is not very helpful to measure accurately with body parts. So instead, all around the world, we all use the same measurement unit. An example is a centimeter.

5. The Facilitator shows the size of a cm on a tape measure, and the Learners all form 1 cm space between their fingers to see the size. The Learners should make a list of things that are about 1 cm, such as a grain of corn, or the width of their little fingernail, etc – something they can easily remember.

6. The Facilitator shows the Learners how to measure accurately with the measuring tape: Start the measurement at 0, at the end of the tape. Make sure the tape is straight and tight. Look at the number that is closest to the end of the object being measured.

7. The Facilitator then asks the Learners to then all measure the length of an object (smaller than 100 cm) using a tape measure. This could be a book or a pencil or a window frame, etc. All Learners should take turns measuring the same object. They should round their measurement to the closest number on the tape measure, and again they make a list of the data on the board to see how much more close the numbers are.

8. The Facilitator should then show how to measure objects that are greater than 100 cm, such as a table that is 175 cm. This is done by first measuring 100 cm to the
end of the tape measure, holding that place on the object or making a mark with a pencil, then moving the tape measure and starting again, and then adding that number to the 100.

9. Each group should be given a tape measure and asked to measure at least 5 different objects in the room, and 5 different parts of their body (ie, handspan, foot, circumference of head, distance between eyes, etc) and record the data in their notebook. They should compare to others’ measurements as well, if they measured the same things, such as their hands or head, etc.

10. They should also measure their heights, which will be more than 100 cm each, and list everyone’s heights in a data table. They can consider different ways to represent everyone’s heights, and compare their heights. They can all line up in order of their heights from shortest to tallest, and see if it matches the order of their recorded measurements.
Milestone 4
Activity 2: Size of a Meter

Materials: tape measure

Activity:
1. The Facilitator reviews by asking how big a cm is. The Learners should show it with their fingers. She should also ask why we use a centimeter to measure.

2. Then she asks them, how many cm long is this room? The Learners should see that the number of cm would be quite large.

3. Using a tape measure, the Facilitator shows that 100 cm = 1 meter, so we can use meters to measure larger lengths. A meter is another unit of measurement used around the world. A meter in Afghanistan is the same as a meter in Pakistan or a meter in Iran, or a meter in America. She asks the Learners to list things that are about 1 m long, such as the height of a goat, or the distance from nose to outstretched fingertip, or distance to the top of one’s hip, etc. They should use the tape measure to find 1 m on their bodies. Again, it should be something they can easily remember, and it might be different for everyone.

4. She asks the Learners to measure the length of the room now, but in meters using a tape measure. They should round to the nearest meter, and compare their measurements.

5. They should then list other things that could be measured in meters (such as height of house, height of a tree, size of a building, length of a garden, depth of a well, etc. and try to estimate what some of these lengths would be (How many meters deep is a well? How tall is an apricot tree? How many meters high is their house?)

If possible, for homework they should try to find this real information (find out how deep is the well, etc).

Other applications include how many meters of fabric are needed for a wedding dress, or for a man’s pirahan-tomban, or for a tent, etc., or the size of a carpet. Let the Learners find as many places that a meter is used as they can.
Milestone 4
Activity 3: Size of a Kilometer

Materials: a map, a ruler or tape measure

Activity:
1. The Facilitator asks how many meters it is to Kabul (or another city). It becomes clear that the distance would be too many meters to count. So instead we use a kilometer. A kilometer is 1000 meters. And again, a kilometer is the same everywhere in the world.

2. To give a ‘feel’ for a kilometer, the Facilitator should tell how many kilometers it is to the nearest big city, and how many days or hours it takes to get there. Also, a kilometer is about how far we can walk in 10 minutes.

3. Make a list of other cities in Afghanistan and how many kilometers it is to each, along with how many hours it takes to get there (by bus, or walking, etc).

4. Ask the Learners to estimate how far it is from the LFL center to their house - should they measure that distance in cm, meters, or kilometers? How far is it from their house to their children’s school? Should they use centimeters, meters, or kilometers?

5. The Learners can also look at a map of their village, their province, the country or the world and find the sign on the map that tells them how to calculate the distance on the map. For example, perhaps 1 cm on the map represents 100 km. From this they can determine the distance from Kabul to any place on the map.
Milestone 4
Activity 4: Applications, Practice, and Estimation of Measurement

Materials: tape measures

Activity:
1. The Facilitator asks, how is measurement useful, when do we use measurement? Allow the Learners to have a discussion about the uses of measurement, and which units of measurement are best in each case (cm, m or km) and why.

2. The measurement of the body can tell us a lot about health. For example, we can tell by looking if a child is too short for her age, and this might tell us that she is not growing very well, or needs more food. But if a child is tall then we usually think the child is healthy and strong.

If a baby is born very small or short, we know that perhaps the baby is weak and will need special care. But if a baby is born with a long and strong body, then we can usually tell that the baby is healthy and its mother was healthy during pregnancy.

EXAMPLE 1: Measuring the womb of a pregnant woman can tell us:
- How many months the woman is pregnant.
- The probably due date.
- How fast the baby is growing.

This measurement can be used usually around 4-5 months into the pregnancy:
How to measure the womb:
Lay the tape measure on the mother’s belly, holding the 0 of the tape measure at the top of the pubic bone.

1. Let the tape measure follow the curve of the mother’s womb, over the belly button and then to the top of the womb.
2. Write down this number of centimeters from the top of the pubic bone to the top of the womb.
3. During the second half of pregnancy, the number of centimeters is approximately the same as the number of weeks pregnant. For example, if a woman’s belly measures 24 cm, then she has been pregnant for around 24 weeks.
4. The womb should grow about 1 cm every week, or 4 cm every month.

What this measurement tells us:
- From these measurements, a midwife can tell if a woman’s womb is growing too quickly or too slowly, or if everything seems normal and healthy. For example, if a woman has been pregnant for 25 weeks, but her measurement is 30 cm, this may mean she has twins, or for some other reason her womb is growing faster than normal. But if her measurement is around 25 cm, then her womb is a normal and healthy size.

Note: If there are any pregnant women in the class, perhaps they can measure her. Or if there is a CHW in the class, perhaps she can explain this method of measurement more.

EXAMPLE 2: Using measurement to check if children under age 5 (age 1-5) are well-nourished and getting enough food.

1. Children who are severely malnourished are very thin, often with a big belly. We can tell by looking that they do not get enough to eat, and they must get more food or they will become very ill.
2. But many children are not severely malnourished; they are moderately malnourished and too thin. They may not look sick, but they are not getting enough food to grow as strongly as they should. If they do not get enough of the right kinds of food, they will grow up to be smaller and weaker than if they had enough food, and will more easily get sick.
3. We can tell if a child is malnourished by measuring around her upper arm, between her elbow and her shoulder, using a special measuring tape made of paper:

Make the paper strip as shown below, using a measuring tape to make the marks in the correct place:

![Picture of a paper strip]

Wrap the measuring tape around the child’s arm and write down the measurement of the child’s arm.

What this measurement tells us:

- If a child’s upper arm is **less than 12 ½ cm** around (in the black area of the strip), then he/she is severely malnourished. She is very thin, and needs to eat better food much more often.
- If a child’s upper arm is **between 12 ½ and 13 ½ cm** around (in the small white area of the strip), then he/she is somewhat malnourished, and is thin for her age. She needs more food.
- If a child’s upper arm is **more than 13 ½ cm** around (in the gray area of the strip), then she is well-nourished and growing well. She is getting enough food.

For example: Nadia has a 4 year old daughter and a 3 year old son. She decided to measure their arms and found that her daughter’s arm measured 13 cm. Her son’s arm
measured 15 cm. This means that her son is well-nourished, but daughter is not getting enough good food. Nadia needs to make sure that her daughter is getting enough to eat at every meal, and give her some extra food as well.

**Note:** The women should *practice* this measurement with some real children. If some children are near the center or children come to the class with the women, the women should practice measuring their arms.
Milestone 4
Extra Activity: Estimation of Measurements: What do we do when we don’t have a tape measure?

Materials: tape measure

1. “What do we do if we don’t have a tape measure?” The Learners must begin to practice estimating lengths physically and visually, without a ruler or tape measure.

2. First, the Facilitator asks the Learners to use their hands, arms, fingers, etc to show a given length: Such as, how much is 50cm (half meter)? Show 1 cm, 10 cm, show 3 cm, show 1 m, etc. How tall is 2 m?

3. The women show each of these with their hands or fingers. Their estimates can be confirmed with a tape measure.

4. Then the Facilitator gives a list of objects for Learners to ‘measure’ by estimation, such as the width of a window in the room, or the length of someone’s hair, or the length of their pencil, or the height of the ceiling of the room, etc. Looking out the window of the room too, the Learners can estimate the size of things they see, like nearby animals or objects or people. They should write their guesses in their notebooks.

5. They can then take the tape measures and check their estimates.

6. They should also practice measuring children’s arms by estimation, so they can begin to feel with their hands if a child is too thin, or is healthy.
EVALUATION ACTIVITIES FOR MILESTONE 4:

1. The Learner must measure the height of one friend in the classroom.

2. She must also measure the upper arm of one friend in the classroom.
MILESTONE 5: WEIGHT AND VOLUME

Objectives:

- Metric units for measurement of gram, kilogram, milligram
- Liter and Milliliter
- Changing of units
- Estimation

Description of the Milestone:

During this milestone, learners will become acquainted with the metric system and measurement units because for measuring, we need a measuring unit which should be usable anywhere and anytime. The measuring units vary when measuring liquids or solids. For example: the measurement unit for corn, fruits, vegetables, cotton and meat is “gram” and the measurement units for liquids such as water, milk and oil is “liter”. With the implementation of this milestone, learners will be able to become familiar with the differences which exist in measuring weights of solid materials like kilogram as well as the units which are used for weighing liquids. Learners will also be able to change small units to big units and vice-versa.
Milestone 5
Activity 1: To Weigh

Objective: Learners will be acquainted with the measuring unit “gram” and know that heavy weights are measured with kilogram and light ones with gram and milligram.

Materials: board, chalk, notebook, pen, flipchart, bags of different materials with a weight of one kilogram and paper clips.

Time: 45 minutes

Activity:

The facilitator will prepare a list of different materials and illustrate them on the flipchart.

Now, the facilitator wants learners to connect the items weighed in kilogram with a red arrow to kilogram and things weighed in grams with a black arrow to gram and come in turns to connect the names of the items to one of the weights. If they are
unable to, she should ask them to consult among themselves and find the right answer. If still there is a problem, the facilitator will give learners brief information as follows:

Let’s see how much is the weight of one kilogram and the weight of one gram? One gram is one thousandth of a kilogram, so we can say that a kilogram is equal to one thousand grams and the weight of a medium size paper clip is equal to one gram. The facilitator can write this information on the board as follows and also show the paper clip to learners:

$$1 \text{kg} = 1000 \text{gr} \quad \text{or} \quad 1000 \text{gr} = 1 \text{kg}$$

1 paper clip = 1 gr

For further clarification of this issue, the facilitator says we have also some measuring units such as sare, pau, khurd and mesqal with which we can measure things but their quantities differ. For example, in Kabul one sare is equal to seven kilograms, in Kandahar a sare is smaller, and the people in Iran do not know sare at all. Therefore, in order that all people anywhere use one measuring unit, we should use gram because gram has a specified weight in all countries of the world.

Now, the facilitator can show a kilogram weight to learners and ask them to feel this weight by their hands. For example, the facilitator can bring a bag of one kilogram rice and a bag of one kilogram potatoes to the class. She then closes a learner’s eyes and gives both bags in her hand separately so that she can feel the weights by her own hands. Then all learners can feel this weight by their hands and know how much is the weight of a kilogram.

**Note:** The facilitator will give learners an assignment for the next day to bring the medicine that is one or two samples of the tablets and capsules which they have in their houses.
Milestone 5
Activity 2: To Know Gram

Objective: To enable learners to know one gram weight or bigger than that.
Materials: A bag of rice weighing one kilogram
Time: 45 minutes

Activity:

The facilitator for the acquaintance of one gram weight can again use the materials which were used the previous day for acquaintance of one kilo. Initially, the facilitator will ask is there a unit smaller than a kilogram? If learners give a correct answer and name ‘gram’, in this case the facilitator will again ask do you know how much the weight of a gram is? Can we feel the weight of a gram by our hand?

Learners may give different answers. However, for better acquaintance with a gram, they should be asked to divide the bag of one kilogram rice to ten equal portions of one hundred grams each. Then divide one of those portions in ten more equal portions and again divide one of those portions in ten equal portions. The size of the last portion is one gram.

In this manner the learners will understand practically that one gram is one thousandth of a kilogram and they can experience the weight of it and also know that a kilogram is equal to one thousand grams.

(1 kg = 1000 gr)

The facilitator continues as follows:

We understand how much the weight of a gram is. Now, is there a unit of weight smaller than a gram? If learners cannot answer, they will be asked to consult among themselves. The facilitator will explain it as below:

If we divide one gram of rice in one thousand portions, each portion is called a milligram and 1 gr = 1000 milligrams. In view of this one milligram is equal to one thousandth of a gram, meaning namely we need to chop up one gram and divide it in one thousand portions and one portion of it will be called one milligram. We can see the weight of one milligram in capsules and tablets, for example a big amoxicillin capsule for adult is 500 mg or antacid tablet is 500 mg and the same capsule and tablet for children is 250mg each. Then the facilitator can practically...
show the capsules and tablet to learners. Likewise, the facilitator continues to say that the weight of the cover is not included in the content of capsule. In this manner, learners become acquainted to the weight of one milligram, and understand that one gram is equal to 1000 milligrams.

1gr =1000 milligrams

Finally, the facilitator asks learners about what they have learned from this activity and says why it is important to know the weights. Briefing learners on the issue, she again points out that it is very important to know the weights and take them into consideration in our daily life. It is very important in taking medicine because if we give medicine to a patient less than the required dose, it will have little effect but, if more is given than is required, the risk and danger will be higher. It is also necessary when estimating food items for a certain number of people to avoid wastage of materials and to have enough food.

The facilitator also will ask learners the following questions and they will give verbal answers. If needed, for finding out answers can be used pen and paper.

1- How many grams is a kilogram equal to?
2- How many milligrams is a gram equal to?
3- How many milligrams is a kilogram equal to?
Milestone 5
Activity 3: To Know Units

Objective: To acquaint learners with metric units in order to use them in their daily life.

Materials: notebook and pen

Time: 45 minutes

Activity:

The facilitator divides learners in groups of two persons and then asks them to make out a list in their notebooks of the food items which they buy each month for their house. She will ask two or three groups about the items which they have listed.

After hearing the answers, she will ask questions such as, “How much flour do you purchase?” One person may answer ‘one bag’. Another question, “How much beans do you buy?” Someone may answer ‘one sare.’ In this manner, the facilitator will ask about the quantity of some of the items available in their lists and after hearing the answer she will ask the weight of all these items and ask some more questions:

- How many sare of flour does a bag contain?
- How many charaks are equal to one sare?
- Do you know how much is the weight of one charak?
- How many paus is one charak equal to?
- How many khurds is one pau equal to?

After hearing answers, the discussion continues:

How many kilograms is a sare equal to? When learners answer seven kilograms then the facilitator can change items being purchased by smaller units and weighed in pau and khurd to gram and milligrams so that learners may better understand the quantity of these units and use them for in measuring of materials.
Milestone 5
Activity 4: To Answer the Questions

Objective: To enable learners to change small units to big units and vice-versa.
Materials: Cards
Time: 45 minutes

Activity:

The facilitator will make cards of different weights written on cards and place them in front of learners. She will pick up a card, give it to a person and ask her to find a card equal to the same quantity and weight. For example, to match a card that says ‘1000 grams’, a learner must quickly find a card that says one kilogram and put them together. Or the facilitator may give a learner a card that says ‘one liter’ and must be matched with the card that says ‘1000 milliliter’.

Samples of cards

<table>
<thead>
<tr>
<th>1L</th>
<th>1000 mg</th>
<th>3 kg</th>
<th>1 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 L</td>
<td>1 gr</td>
<td>1000 gr</td>
<td>3000 gr</td>
</tr>
<tr>
<td>4000 L</td>
<td>1000 mL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the same manner, the facilitator, in the same manner as the prepared cards, can ask learners several questions and wants a learner to find a card containing the correct answer:

1. How many milliliters are 5 liters equal to?
2. How many liters are 2000 milliliters equal to?
3. How many milliliters are 3 liters equal to?
4. If someone is sick and a doctor advises her to inject 50 ml until she has received 200 ml of medicine, how many times this ampoule will be injected?
5. How many milligrams is a kilogram equal to?
6. How many grams is one and half kilograms equal to?
7. What unit is the dose and weight of drugs measured with?
8. How many grams is a kilogram equal to?
9. How many milligrams is a gram equal to?
10. What can happen if a dose of medicine is given to a patient mistakenly without prescription of a physician?

Learners in this manner can practice and change more different quantities.
Milestone 5  
Activity 5: To Estimate

Objective: To enable learners to prepare a required amount of food for a certain number of people.  
Material: pen, notebook, board, chalk  
Time: 45 minute

Activity:

The facilitator will ask learners whether they are able to use measurement units in daily life. They may give different answers. For example: yes, we make use of measurements units for measuring drugs, food items or for preparing enough amount of food our family, etc.

Now, the facilitator will divide the class in groups of three persons and say, “Suppose that tomorrow night we will have 20 guests and you should make out a list of food items including the quantities needed.”

Of course, the quantities should be indicated in gram, kilogram and liter. When the list is completed, each group will read their intended list loudly so that the others can hear.
Objective: To acquaint learners to the measurement units for liquids, liter and milliliter.

Materials: glass, bucket, jug or bottle, notebook and pen

Time: 45 minutes

Activity:

The facilitator explains: You learned that all solid materials are weighed in g, kg, mg. Now tell what units are water, vinegar, syrup and fuel measured with? Learners should consult with each other about this question.

Then the facilitator will also ask learners to make groups of four persons and answer the following questions:

- Can we measure water with gram?
- Do you know the size or amount of a liter of water?
- What is an example of a container that contains a liter of water?
- How many liters of water does a Russian glass contain?
- How do we write one liter?

Learners may write (one liter) or (1 liter). The facilitator will explain that the word liter is indicated by the English letter (L) and we can write it as 1 L.

If there is still any mistake in the answer to the question, the facilitator will explain that five glasses of water is equal one liter. The facilitator can bring a bucket with a glass to the class, pour one liter of water in it and ask learners to see numbers of glasses of water that will fill up the bucket. Learners will practice the activity in the same manner and count how many liters of water can fill up the bucket.
The facilitator can also ask learners to measure half a liter of water in the bucket. Likewise, she wants learners to experience quantity of half a liter of water and one fourth of a liter in a jug or bottle and practically see the measure and show it to others.

After the learners have experienced the measurement of one liter, the facilitator will ask learners how many glasses of water and tea they drink daily.

- Can you change this quantity to liters?
- How many liters of water does our body need daily?

**Information for facilitator:**
Every adult human body needs 4 liters of water daily and this quantity is taken by the body in different ways. For example: drinking of water, tea, syrup, eating fruits, soup and the foods containing more liquids such as vegetable soup, etc.

The facilitator can give learners an assignment for the next day to bring to the class empty bottles of syrup (medicine), injection ampoules and/or empty packets of serums they have available in their houses.
Milestone 5  
Activity 7: To Know Milliliter

**Objective:** To enable learners to know the measure of one milliliter and practically experience its measurement.

**Materials:** tablets, capsules, empty bottles of serum, syringes, ampoules and teaspoon.

**Time:** 45 minutes

**Activity:**

The facilitator will ask learners, when you take your child to the doctor, what type of medicine did the doctor give to your patient after examination? The answers from learners may be things such as tablets, syrup, ampoules and serum.

Now, the facilitator will ask which one of the medicine is liquid? One of the learners would answer syrup, serum and ampoules. Then facilitator asks, “Syrup, serum and ampoules contain small amounts of liquid that are less than a liter, so what do we measure this little quantity with?”

Learners might answer, fourth of a liter, fifth of a liter, etc. The facilitator asks is there a unit available smaller than a liter with a specified weight? The facilitator will ask learners to look at the back of serum packets and bottles of syrup which they have brought from their houses and find out the units of measurement used.

If learners are unable to find and read, the facilitator will explain it and add that the smaller unit for liter is milliliter and indicated in English letters (ml) namely 1L = 1000 ml and the liquid medicines are generally prescribed to be taken with spoon or teaspoon:

- 15ml = 1 full meal spoon
- 5ml = 1 full small teaspoon

And a full meal spoon = 3 full teaspoon. When a doctor prescribes one full teaspoon, it is 5 milliliters, however the teaspoons used by people has the capacity from 3 to 8 ml. However, when using a teaspoon for administering medicine, we should ensure that it is 5ml, especially when giving medicine to children. This issue is very important.

The facilitator will ask learners, “How can you ensure that the capacity of a tea spoon is 5ml?” Learners may give different answers and may recommend various methods of measuring ml, however the facilitator should clarify it as follows:
1. Buy a standard 5ml spoon. These spoons are normally plastic and available with bottles of syrup and have a line which indicates half of 5 ml that is 2.5 ml.

2. Keep this spoon and use it for measuring other medicines.
3. Take water into a syringe, noting the mL. Squeeze it into a small spoon and mark the liquid level in the spoon.

After this part has been explained by the facilitator, for further practice, she will ask learners many questions for them to answer. She can also make some cards and write different amounts on them:

<table>
<thead>
<tr>
<th>3L</th>
<th>=</th>
<th>Fourth of a liter</th>
<th>0.5 L</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 L</td>
<td>3000 ml</td>
<td>2000 ml</td>
<td></td>
</tr>
</tbody>
</table>
Now, the facilitator will place the cards before learners, divide the class in two groups and request one group to pick up a card and give it to the next group. At the same time she puts the cards having the equal sign in a place to be visible to all and so that the same group put the card on one side of the equal sign and the other groups will put another equal card.

If the answering group is not able to give a correct answer, the other group gets a point.
Milestone 5
Activity 8: To Become Acquainted With a Small Quantity Such as Milliliter

Objective: To enable learners to identify quantities of syrups, syringes, and serums using milliliters.

Materials: bottles of syrup

Activity:

The facilitator explains to learners that each big unit has smaller components like centimeter which is a smaller component of kilometer and gram which is the smaller component of kilogram. Now, the facilitator should introduce measure of one liter and its small unit namely, one liter is equal one thousand milliliters.

In order that learners may better understand the concepts of liter and milliliter, the facilitator will hand pictures of graded containers with the system of liter and milliliter on the board like the following forms:

Then the facilitator will instruct learners to be divided in two groups. The first group should arrange a list of tablets being measured in milligrams and the second one should make a list of syrups, ampoules and serums which are indicated in milliliters. The facilitator will explain the difference between tablets and syrups to learners and will mention that the solids are measured with grams (gr) and the liquids with liter (L).

At the end of group working, learners should practically measure 20 milliliters of syrup using spoons.

Note: The facilitator should advise learners to try and take care when giving medicine to a patient. Apply the measures indicated the back of bottles.

Example:
When a child needs 2 ml of syrup, the mother should not use a 5 ml spoon as giving syrup more than the advised dose will be harmful for the child.
EVALUATION ACTIVITY FOR MILESTONE 5:

The facilitator will ask learners to stand in a circle. Then asks the questions which she has already prepared concerning the measurements.

The facilitator will roll up a paper like a ball and throw it toward one of the learners. The learner who catches the ball will have to answer the facilitator’s questions. And after giving the answer will throw the ball to another learner who will also answer to the facilitator’s next question. In this manner learners will throw the ball to each other until all of them answer a question. If needed each learner should answer two questions. The facilitator should try not to ask the questions repeatedly and he should have a separate question for each of the learner.

Examples:

1- How many milliliters are equal to one liter?
2- Which unit are liquids measured with?
3- Why is it important to know and take into consideration measurement units?

The facilitator can also ask the questions which are available in the cards being prepared for Activity 5.
MILESTONE 6 : SIMPLE FRACTIONS

Objectives:
- Fraction Concept
- Demonstration of Fraction
- Arrangement of Fraction
- Fraction Estimation
- Equivalent Fractions

Description of the Milestone:
By learning this milestone, learners will be able to understand the concept and definition of fraction and be able in their daily life to divide a thing into several equal portions and take one or two portions of it. They can consider this operation especially when taking medicine like such as tablets, syrups, etc. They should be able to divide a big tablet into two, three or four equal portions and also understand how much of syrup has been taken within a week or three days’ time.
Milestone 6
Activity 1: Introduction of Fractions

Objective: In this activity, learners will understand the concept and definition of fraction.
Materials: a sheet of paper, pen, ruler, or measurement ribbon.
Time: 45 minutes

Activity:

The facilitator will show a sheet of paper to learners and ask what is this? Learners would answer a sheet of paper. She will again ask how many sheets of paper is this? Learners would give answer, one sheet of paper. The facilitator then requests a learner to fold the same sheet initially into two, then into four and finally eight equal parts so that the folds remain visible on the paper so the learners can see whether the sheet of paper has been divided into equal parts.

Now, the facilitator will ask the same learner to tear a part of it off. The facilitator will put a question to learners, what did the learner do? The learners will answer she initially divided the paper into eight equal parts and later on tore a part of it.

The facilitator will again ask what is the action called which has been performed? If the learners give a correct answer, it is ok. Otherwise the facilitator herself will explain the matter as follows:
If we divide a thing into some equal parts and then take one of several parts if it, in fact the action which we performed is called fraction. She continues and says that, when a sheet of paper is divided into six equal pieces and a part of it is taken, how can we write it? Learners will consult among themselves to find the way how to write it. If learners are able, one person will come and write the fraction on the board and if not, the facilitator will herself write it as under:

\[ \frac{1}{6} \]

The facilitator is going to ask what does 1/8 mean? The learners would answer we divided a sheet of paper into eight equal pieces and took a piece of it. It means eight equal pieces of paper of which one piece has been taken and detached from the rest.
Milestone 6  
Activity 2: To Understand Fractions from Pictures

Objective: Learners will be able to understand fractions. 
Materials: pictures, different figures, board, chalk, notebook, pen and the learners’ book 
Time: 45 minutes

Activity:

The facilitator will put the following figure in front of learners or draw it on the board and will ask learners to tell how many parts has been this figure divided into?

After learners have given the answer, facilitator will write the correct answer below the figure. Now, she will color the two top parts of it and asking learners to tell that how parts of it have we have colored? And how can we write this figure?

After each learner has consulted with her classmates, one person will come and write the figure as follows:

\[
\frac{2}{4}
\]

Namely, from four parts, two parts have been colored.

Now, the facilitator places different pictures in front of learners and will ask them to write down the fractional figures for them. These pictures are available in the “Learners Book” too.
Learners should understand that the parts taken are written on the line, and the remaining number of parts under the line as the denominator. The facilitator asks learners to look at figures, and will then explain as under:

This figure has two equal parts of which one part has been painted black. So half of the figure is black and half of it is white, so how do write the half? Learners’ answers would be different. If the answers are right, the facilitator asks them to write it as the following figure:

\[
\frac{1}{2}
\]

Afterwards, for further clarification, she will place the following figures in front of learners and ask them to identify and write the figures. Learners will write the figures which they can identify and the ones which can not be identified should put (x) below the figure.

**Example:**

Likewise, the facilitator shows the following figure and asks learners to tell how many parts has this been divided into? Then she says how we can write the fractional number for this figure. A learner will come and write it on the board.
\[ \frac{1}{3} \]
Milestone 6
Activity 3: The Concept of Fraction

Objective: To enable learners to understand the concept of fraction and practically use this concept.
Materials: A round loaf of bread
Time: 45 minutes

Activity:

The facilitator will divide the class into groups and then gives each group a loaf of bread or some other available edible thing such as: apple, cake, cookies, watermelon, potatoes and etc.

She wants group 1 to divide a loaf of bread (or other food) into 10 equal pieces, group 2 to divide a loaf of brad into 8 equal pieces, group 3 to divide a loaf of bread into 12 pieces and group 4 if available to divide a loaf of bread into 12 pieces.

When all groups have divided the loaves of bread into equal pieces, the facilitator will instruct each one to take a piece of bread for herself and write down this operation on small sheets of paper, place it on the divided pieces and see how many equal pieces have they divided a loaf of bread into and how many pieces have they taken? Of course they should write it in the form of fractional number. After all groups have written the fractions, one person from each group should come and write their fractional number on the board. And if they have made any mistakes, the others will correct it.

Note for facilitator:
The facilitator should pay attention so as the materials have been divided equally, and if needed, should help learners to equally divide loaves of bread.

If the groups are equal and there are four persons in each group, in that case, they should write their fractions as follows:

<table>
<thead>
<tr>
<th>Group</th>
<th>Fraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(\frac{4}{10})</td>
</tr>
<tr>
<td>2</td>
<td>(\frac{4}{8})</td>
</tr>
<tr>
<td>3</td>
<td>(\frac{4}{12})</td>
</tr>
<tr>
<td>4</td>
<td>(\frac{4}{14})</td>
</tr>
</tbody>
</table>

In this manner, learners understand that, they divided a thing into several equal parts and took four parts of it and in fact practically performed a fraction operation. At the end, the facilitator puts questions to learners of different groups:

What does \(\frac{4}{10}\) mean?
What does $\frac{4}{8}$ mean?

What does $\frac{4}{12}$ mean?

What does it mean? $\frac{4}{14}$

What did this group do as a result of which this fractional number has been obtained?

**Example:**

Group 1 says we divided a round loaf of bread into ten equal pieces then picked up four pieces of it, and we write the operation being performed as follows:

$\frac{4}{10}$

Now, the facilitator wants each group to hold up a piece of bread and see which group has bigger pieces of bread and which one has a smaller piece? Similarly, learners will in this activity learn and experience which fractional number seems bigger and which one seems smaller.
Milestone 6
Activity 4: Demonstrating Fractions

Objective: With this activity learners will be able to practically experience fractions and demonstrate the outcome of their experiment by numbers.

Materials: empty bottle of Coke or Fanta, glass, board, chalk and learners’ book

Activity:
The facilitator will fill up the bottle with water, then place it in front of learners and ask how much water is available in this bottle? Learners would answer, the bottle is full.

The facilitator will divide the bottle with a drawing pen into three equal parts and ask another learner how many parts have I divided the bottle into? The learners would say, in three parts.

Then she will ask someone else to come and empty water from the bottle to the extent of the first line in a glass. After this, the facilitator will ask her how much many water did you empty? The learner would say I emptied one part of the bottle water. The facilitator will ask another learner how much water was initially available in the bottle? The answer is three parts. The facilitator will ask how much water is remaining in the bottle now? They would say two parts. Then the facilitator will question a learner whether she can demonstrate and write the same operation on the board and can she ask one of the learners to write it on the board so that the others note this operation in their notebooks.

Now, to better understand fractions, facilitator will divide learners into groups and give each group a container to experience and test different quantities of water and write it in their notebooks. For example she will give one group a glass, the next a bottle and another one a bucket and the last one a jug to fill them up with water and mark them to 2, 3, 4, 5 and 10 equal parts.

Then empty or add some water to the containers and write this operation in their notebooks. Upon completion of the experiment by all groups, one person will come and write her fractional number on the board and also tell how much water has she emptied and how many much remained in the bottle. And if she has made any mistakes, members of other groups would correct it. The facilitator should also be attentive to properly correct mistakes, guide and help learners.

In this manner, the groups can experience different quantities in their containers. They can also write how water from bottle has been emptied and how much is remained.

Note: The facilitator should attract learners’ attention to the fact that the neck of the bottle is very thin and will contain less water than the bottom of it. Therefore, the facilitator should cut the necks of the bottles of Fanta and Coke to be identified so that there is equal quantity of water in all parts of the bottle. At the same time for further practice and understanding of learners she should also refer to the Activity 4 of “Learners’ Book” for the Learners to practice.
Milestone 6  
Activity 5: Arrangement and Comparison of Fractions  

Objective: Learners will be able to arrange and show fractions  
Materials: Cards of fractional numbers, apple, pen, notebook, board and chalk.  

1. The facilitator will write some fractional numbers on the cards:  
Examples:  
\[\frac{1}{4} \quad \frac{5}{8} \quad \frac{1}{6} \quad \frac{3}{10}\]  

2. Then, she will divide the class into groups and give each group a card with an apple  
and/or some other thing available and will ask them to divide their apple according to  
the written fractional number. For example, the first group is to divide the apple into 4  
equal parts and take one part and put it on the card, the second group to divide the  
apple into 8 equal parts and put 5 parts of it separately, etc.  

3. In this manner, all groups will perform this operation and see each other’s group work,  
whether the operation has been performed correctly. If one of the groups has made a  
mistake, the others will correct it.  

Now, each group will take a divided part of their apple and compare it with the other groups  
and see which group’s apple is bigger and from which group it is smaller. They will find:  

\[\frac{1}{10} < \frac{1}{8} < \frac{1}{6} < \frac{1}{4}\]  

And thus \[\frac{1}{4}\] is bigger than \[\frac{1}{10}\].  

1. Now, the facilitator will ask all groups why a part of an apple of one group is bigger  
than the other. She collects the answers of all groups and herself explains that the  
apple is divided into 4 parts and one part is taken, therefore, this part is bigger,  
however, if an apple is divided into smaller parts, the size of each part will be also  
smaller, for instance if we divide an apple into two parts it is bigger than if it is  
divided into 20 parts:  

\[\frac{1}{20} < \frac{1}{2}\]
Milestone 6
Activity 6: Estimation of Fractions

Objective: Learners will be able to determine the fractional measure of different materials.

Material: glass or some other container being available, water, notebook, pen, board and chalk

Activity:
1. The facilitator will fill up a glass partway with water and then place it in front of learners to tell which fractional part of the glass is full of water and which part is empty. Learners may give different answers, however, we should pay attention that estimating will not be hundred percent right, namely estimation is made approximately. And the more correct answer would be the one which is nearer to the reality.

2. Now, in order to understand whether the estimation made by learners is correct or not? We want one of the learners to measure the glass with a ruler and mark each part to equal sizes, for example: She divides the glass into four equal parts and see that there is no water in the third part of the glass and is empty. A learner should be asked to write this fraction on the board: 3/4

It means that third part of the glass has no water.

3. Now, we divide the class into small groups and give a container filled with water or some other liquid to each group. If there are not any containers available, the facilitator can then use pictures.

Example:
She gives a bottle of medicine to the first group and says that, a child has taken 1/5 of the syrup within two days. Now how much of syrup has been taken and how much is left?

She gives the other group an empty can of oil to estimate how much water is there in it and how many parts are empty?
The other group should think how long do they work in the kitchen and how long do they look after animals, and how long are they busy on cleaning and tidying of house?

Another group should write the fractions about one night, three nights, one week, ten nights and finally twelve nights moon, how much of it will be seen?

When these answers are found, group should change the mount of water in the bottle, can and glass and requests the other group to write its fractional number on the board. If they make any mistake, the asking group will write the correct answer and this activity is performed in a competitive manner.

Likewise, each group can ask such questions related to their daily life from the other group and the next group to answer.
EVALUATION ACTIVITY FOR MILESTONE 6:

The facilitator will write different fractional numbers on small pieces of paper and then put them upside down before learners and asks each one to pick up a card.

Then the learners should take a sheet of their notebook and practically show this fractional number.

Example:

\[
\frac{2}{4}
\]
MILESTONE 7: BASIC PERCENT

Objectives
- Understand meaning of percent
- Interpret data in percent form
- Understand relationship between percent and fraction

Description of the Milestone:
The goal of this milestone is for the Learners to be able to understand the meaning of percent and the relationship between fractions and percent. And also to be able to use percent in their daily work. For example, if someone planned to perform a task in 2 weeks, if she has spent almost a week working on it, she can think how much work is performed, and how much work is left. If half of the work is performed, she can say 50 % work is done, and when the work is completed she could say the work is 100 % done. This milestone only involves basic percentage questions.
Milestone 7  
Activity 1: Understanding and Applying Percents

Objective:  
to become able to apply percent in daily work
Time:  
45 min

Activity:
The Facilitator should ask the learners if they have ever used or heard the word ‘percents’ in their daily conversation.

Afterwards, the Facilitator should divide the class into many groups and have each group say some example of percents. Each group makes some examples first, and then read them.

For example, the first group may say a school is going to be build in our village and up to now, 50 % of the construction work is preformed. The second group may say our villager head has started to dig water well and install a hand pump. 20 % of digging process is accomplished.

Every learner says an example and the Facilitator listens to them, and at the end, the Facilitator also make an example as below:

A vender buys vegetables wholesale for 360 Afs in order to sell them for profit. At the end of the day he brings in about 54 Afs. The next day, he spends 480 Afs to buy vegetables for selling and at the end of the day he brings in 70 Afs. Which day did he make more profit, the first day or the second?

To look at the example, we cannot say which day the vender got more profit based on his capital. As soon as we understand percent and ratio, we can calculate his net profit.

The Facilitator asks one learner to multiply 54 by 100, and say the result. And another learner should divide the resulted number by 360. (They are allowed to use canceling method)
First day:

<table>
<thead>
<tr>
<th>Capital</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>360</td>
<td>54</td>
</tr>
<tr>
<td>100</td>
<td>?</td>
</tr>
</tbody>
</table>

\[
\frac{5 \times 3}{100 \times 54} = \frac{5 \times 3}{18} = \frac{360}{18} = 1
\]

Second day:

The learners should be asked to do multiply \( 70 \) by \( 100 \) and another Facilitator should divide the resulted number by \( 480 \).

<table>
<thead>
<tr>
<th>Capital</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>480</td>
<td>70</td>
</tr>
<tr>
<td>100</td>
<td>?</td>
</tr>
</tbody>
</table>

\[
? = \frac{7 \times 100}{480} = \frac{700}{48} = 14.583
\]

The Facilitator should say, as you see, the vendor makes 15% on the first day and 14.583% the second day. So in the first day he got more profit.

Then, the Facilitator should ask any learner who knows the symbol for percent to come and write it on the class board. If not, then the Facilitator should write it herself on the class board.

Percent symbol is %

First day net profit is 15%
Second day net profit is 14.583%
Milestone 7
Activity 2: To Recognize Fractions and Identify Percents

Objective: to become able to understand and apply percent
Material: notebook, pen, class-board, chalk
Time: 45 min

Activity:
The Facilitator should remind the learners that they have learned about fraction concepts and how to show fractions. Now, we’re going to write a specialized fraction.

The Facilitator should ask if anybody knows percent, the learners give different answers. The Facilitator should listen to the learners at first, and then add some information as follows:

Percent is actually calculating and dividing by 100.
Example: The Facilitator writes the following figure on the class board and then she asks if anybody can write it in fraction form?

Perhaps, one of the learners writes \( \frac{25}{100} \)

The Facilitator should ask what does mean?

Perhaps, the learners would reply, an object is divided into 100 parts, and only 25 parts are taken

The Facilitator organizes the learners in pairs and asks them to discuss with their partner and find out how to write \( \frac{25}{100} \) in percent form.

If the learners cannot give the correct answer, then, the Facilitator should help them know the correct answer.

The Facilitator asks one of the learners to divide 25 by 100 and multiply the resulted number by 100. \( \frac{25}{100} = 0.25 \times 100 = 25\% \)

(25% of the students have passed the exam)

If the learners don’t know how to do decimal division, then the Facilitator instructs, since the numerator, 25, is smaller than the denominator (100), so put a zero at the units place
first, and then write decimal symbol. Put another zero beside the decimal symbol. When you write a decimal symbol, you can add up to 2 zero beside a decimal symbol as well.

Now, the Facilitator divide the class into 3 groups and give each a group a figure as below to put in fraction form, and then convert into percent:

**Group I:**

<table>
<thead>
<tr>
<th>Group I:</th>
<th>15/100 = 0.5 x 100 = 15 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group II:</td>
<td>8/100 = 0.8 x 100 = 8 %</td>
</tr>
<tr>
<td>Group III:</td>
<td>17/100 = 0.17 x 100 = 17 %</td>
</tr>
</tbody>
</table>

15 % of the students have passed
8 % of the students have passed
17 % of the students have passed
Milestone 7
Activity 3: Applying Percent and Learning More About It

Objective: to become able to apply percent in different materials
Material: notebook, pen, glass-board, and chalk

Activity:

The Facilitator makes a question as following:
If 8 gram of butter exists in 100 gram of milk, how much butter would exist in 480 grams of milk?

<table>
<thead>
<tr>
<th>Milk</th>
<th>Butter</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>?</td>
<td>480</td>
</tr>
</tbody>
</table>

Perhaps, the learners say, more quantities of butter exists in 480 grams of milk, since 8 grams of butter exists in 100 grams of milk. But the Facilitator explains how to find out the exact amount of butter exists in 480 gram of milk as follows:

Facilitator says divide 480 by 100, and the learners should do the division operation manually in their notebook.
The Facilitator should choose a student among all to come in front of the class and divide 480 by 100 on the class-board. Other learners compare their work with the class board and correct their mistakes if they made any.

\[
\begin{array}{c|c}
480 & 100 \\
400 & 4.8 \\
800 & \\
800 & \\
8 & x \\
\end{array}
\]

Afterwards, the Facilitator says, multiply the resulted number (4.8) by 8. All the learners should do the multiplication operation manually in their notebook. And one of the learners would be chosen to come in front of the class and do the multiplication on the class-board.

\[
8 \times 4.8 = 38.4
\]

Again, the Facilitator asks the learners if they understand how much butter exists in 480 grams of milk. She choose a learner to come in front of the class-board and write the amount of butter exists in the 480 grams of milk.
The learners would write 38.4 grams of butter exists in the 480 gram of milk.
Milestone 7  
Activity 4: More About Percent  

Objective: to become able to recognize ratio and percent. 
Time: 45 min  

Activity  

The Facilitator organizes the learners in groups of 4, and then she poses a few questions to be done by each group. When a group finishes their task properly, the Facilitator should have them help other groups. If any group still has problems, the Facilitator should help them herself.  

Questions:  
An electric pole has about 2.5m height and about 3.5 m long shadow.  
A building located beside the electric pole which has about 140 m long shadow.  
Can you find out how tall is the building?  

The questions should be written like this:  

<table>
<thead>
<tr>
<th>Height</th>
<th>Shadow</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>3.5</td>
</tr>
<tr>
<td>?</td>
<td>140</td>
</tr>
</tbody>
</table>

Now, the Facilitator says, you should divide 140 by 3.5 in order to find out the height of the building.  

\[
\begin{array}{c|c}
1400 & 3.5 \\
140 & 40 \\
\hline
x & x \\
\end{array}
\]

Afterward, 4 should be multiplied by 2.5.  
40 x 2.5 = 100  

Now, we found height of the building to be about 100 meters.
Milestone 7
Activity 5: Applying Percent with Word Problems

Objective: to become able to apply percent with text question
Material: class-board, chalk, notebook, and pen
Time: 45 min

Activity
The Facilitator should divide the class into 3 groups at first and then give each group a question to be solved. One person from each group should come in front of the class and write their answer on the class-board. If any group makes mistakes or has any difficulties, other groups should help them. If the problem still exists, the Facilitator should teach them how to solve it. The learners should copy the answers into their notebook.

Group 1 Question:
A company’s total salary is 350,000 Afs per month. The Office Manager decides to increase the salary by 25%. How much would be the total monthly salary after 25% increase?

Group 2 Question:
A car cost $45,000 and Zohra wants to buy it. The car owner says that he would give 35% discount for Zohra. How much will Zohra have to pay?

Group 3 Question:
Fatima bought a golden bracelet for 200,000 Afs. After a month she sold it back and made 5000 Afs profit. How much percent profit did she gain?
Note for the Facilitator:
Answers:
Group 1: Answer

\[
25 \times 350,000 \quad = 87,500 \\
100
\]

Group 2: Answer

<table>
<thead>
<tr>
<th>Cost</th>
<th>Discount</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>15</td>
<td>45000</td>
</tr>
<tr>
<td>45,000</td>
<td>?</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>500</td>
</tr>
</tbody>
</table>

If 15 % discount was given for $100, then $400 discount should be given for $45,000. After increase, the employee’s salary would be 400 Afs.
EVALUATION ACTIVITY FOR MATH MILESTONE 7

The Facilitator should divide the class into two groups, and every group should make 10 questions by themselves. The learners should discuss with each other within each group but they should not let other groups to see their questions. When 10 questions are made in each group then the 1st group should ask a question and the 2nd group should answer, and then the 2nd group should ask a question and the 1st group should answer so it should continue like this.
Each learner should take part in this game equally.
MILESTONE 8:
1-2 DIGIT DIVISION, AVERAGING, ROUNding, AND RECOGNIZING MILLIONS

Objectives:
- Numbers up to 1,000,000
- Calculating average
- Whole numbers and estimated numbers

Description of the Milestone:
The learners have learned how to read and write numbers up to 100,000 before. In this milestone we will learn numbers up to 1,000,000 and also 1-2 digit division, taking average, and rounding. Then the learners will be able to perform addition and multiplication faster and even without pen and paper.
Milestone 8
Activity 1: Reading and Writing Millions

Objective: to become able to recognize millions, and counting up to 7-digit numbers
Material: notebook, pen, class-board, chalk
Time: 45 minutes

Activity
The Facilitator should draw a chart of place value on the class-board. Then, she should divide the class into 2 groups. The first group should write a 6-digit number on the chart, and the second group should read it, then the second group should write a number on the chart and the first group should read it. Learners should do this activity for 6 or 10 minute to recall 6-digit numbers.

Then, the Facilitator should be divided into 4 groups and each group should be given a question as following:

- 1st Group: What is the last number of a 6-digit number? Read and write it.
- 2nd Group: What number would come after 999,999?
- 3rd Group: How do you write hundred thousand? And how do people say hundred thousand commonly?
- 4th Group: How do you say 10 Lakh in math?

After discussion, each learner should say their answers. When the learners understand that the last number of 7 digit number is in the millions place, then she should ask a learner to come in front of the class to write 1,000,000 on the class-board. If possible, the learners should try to write 7-digit numbers, as well, and read it. The Facilitator should help the learners to read and write correctly.

<table>
<thead>
<tr>
<th>3rd category</th>
<th>2nd category</th>
<th>1st category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Millions</td>
<td>Hundred thousands</td>
<td>Ten thousands</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Milestone 8  
Activity 2: Division

Activity
The Facilitator should divide the class into 4 groups, and then give each group a division question to solve. After each group finishes their task, they should give their notebook to another group to check. Then, one person from each group should come in front of the class and write the steps she used to solve the division question.

<table>
<thead>
<tr>
<th>Group 1st</th>
<th>Group 2nd</th>
<th>Group 3rd</th>
<th>Group 4th</th>
</tr>
</thead>
<tbody>
<tr>
<td>630</td>
<td>6</td>
<td>580</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>668</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>725</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

Now, each group should make a division question and give it to another group to solve it. When all groups finished solving the division questions, then they should give it back to the group who made the question for correctness.
Milestone 8  
Activity 3: Two – Digit Division

Objective: to become able to divide large numbers by 2-digit numbers  
Material: flipchart, notebook, pen, class-board and chalk  
Time: 45 minute

Activity

The Facilitator should divide the class into 8 groups and then cut a flipchart page into 8 equal parts. Each group should take a piece of paper and fold them more in smaller pieces and then cut them by a scissor. Then, one person should count all groups’ paper and write the total number on the class-board. For example: 2048.

The Facilitator should ask how many learners are in this class. When the learners answered the question, then the Facilitator should write it on the class board. For example: 15

Then, the Facilitator should ask the learners to divide the total number of paper to the number of learners and see how many papers each learner would receive.

Afterwards, the Facilitator should ask the learners to divide 2048 by 15 in your notebooks and work with each other within each group. One person from the group which finished should come in front of the class and write the question on the class board and solve it.

\[
\begin{array}{c|c}
2048 & 15 \\
15 & 136 \\
54 & \\
45 & \\
98 & \\
90 & \\
8 & \\
\end{array}
\]

If there is time, the Facilitator can organize the learners in group of 2 persons. Each group should divide 2,048 by different 2-digit numbers such as: 12, 14, 16, 18, 22, 31 and so on.
Milestone 8
Activity 4: Taking an Average

Objective: to learn how to take average
Material: measuring tape, ruler, notebook, class-board, and pen
Time: 45 minute

Activity
The Facilitator should divide the class into 2 groups. One group should have only those who are younger than 24 years old, and another group should have only those who are older than 24 years old. The learners should measure each other’s heights within each group.

Each learner should stand backward to the wall and let another learner to put a ruler over her head, make a mark on the wall and measure from the ground up to the marked point on the wall by a measuring tape. Then, each height should be recorded such as in the following table:

<table>
<thead>
<tr>
<th>No</th>
<th>Name</th>
<th>Height</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Najiba</td>
<td>169 cm</td>
<td>16 y</td>
</tr>
<tr>
<td>2</td>
<td>Afifa</td>
<td>165 cm</td>
<td>25 y</td>
</tr>
<tr>
<td>3</td>
<td>Zohra</td>
<td>152 cm</td>
<td>24 y</td>
</tr>
<tr>
<td>4</td>
<td>Fatema</td>
<td>150 cm</td>
<td>17 y</td>
</tr>
</tbody>
</table>

After every learner’s height is recorded, the Facilitator should ask, what is the average height for those who are about 16 to 24 years old?

Perhaps, the learners would say something but for precise answer, the Facilitator should ask a learner to come in front of the class and add up heights of those who are about 16 to 24 years old in this class as the following:

\[
169 \\
165 \\
152 \\
150 \\
\hline
636
\]
Then, she should divide the resulted number to the number of learners whose ages are about 16 to 24.

\[
\begin{array}{r|rr}
636 & 4 & 159 \\
4 & 23 & \\
20 & 36 & \\
36 & & 36 \\
\end{array}
\]

Now, we can see 159 is resulted from dividing of 636 by 4 so it means 159 cm is the average heights.

Afterwards, the Facilitator should divide the class into two groups again, and ask one group to find out the average age of those who are about 16 to 24 years old. And another group should find out the average age of those who are older then 24 years old. The Facilitator should check with each group very often and correct their mistakes.
Milestone 8
Activity 5: Rounding

Objective: to become able to do approximate calculation
Material: class-board, chalk, notebook, pen and number cards
Time: 45 minute

Activity
We use rounding for statistics and counting population purposes. In order to teach how to do approximate calculation, the Facilitator asks the learners to show which number is very close to 20 or 30. One person should come in front of the class and showing the numbers which are close to 20 and 30 by drawing arrows as below:

26
21
28
19
25
27
22
29

The Facilitator should explain that 21 and 24 are close to 20, and 25 and 29 are close to 30.
How can you round the following numbers?
78, 75, 51, 53, 81 and 82

78 is close to 80
75 is close to 80
51 is close to 50
53 is close to 50
81 is close to 80
82 is close to 80

Afterwards, the Facilitator should write various numbers on the papers cards and leave them in front of the learners.

Example

<table>
<thead>
<tr>
<th>420</th>
<th>620</th>
<th>525</th>
<th>710</th>
<th>602</th>
</tr>
</thead>
<tbody>
<tr>
<td>598</td>
<td>610</td>
<td>349</td>
<td>579</td>
<td>490</td>
</tr>
<tr>
<td>525</td>
<td>510</td>
<td>690</td>
<td>450</td>
<td>699</td>
</tr>
</tbody>
</table>
The Facilitator should write three different numbers on the class-board which correspond to the number cards. Each learner should search the number cards to find the number on the class-board that is the closest number when rounding.

The Facilitator should prepare the numbers cards according to the number of learners so that every learner can participate in this activity.

This activity will let the learners to use diverse numbers for approximate calculation. For example, we have several numbers and should add them up such as: 52, 48, 63, 41 and 59.

Now, we can see which numbers are close to each other.

First we round the numbers off then we add them up:

\[
\begin{array}{ccc}
52 & - & 50 \\
48 & - & 50 \\
63 & - & 60 \\
41 & - & 40 \\
59 & - & 60 \\
\end{array}
\]

\[
\begin{array}{c}
263 \\
25 \\
13 \\
10 \\
3 \\
\end{array}
\]

\[
\begin{array}{c}
260 \\
25 \\
10 \\
10 \\
x \\
\end{array}
\]

Now, we add up each column and then divide them to the numbers of rows.

\[
\begin{array}{ccc}
263 & 52 \\
25 & 25 & 52 \\
13 & 10 & 10 \\
10 & x & x \\
3 & & \\
\end{array}
\]

Now we can see the differences are very little.
Milestone 8
Activity 6: Taking Average in Story Problems

Objective: to be able to do averaging
Material: pen, notebook, class-board and chalk
Time: 45 minute

Activity
The Facilitator should ask how you can take average. The Facilitator should divide the class into many groups and give each group a question to be answered. Each group should solve the problem and then show them to the other groups for correction. The Facilitator should help guide them how to solve each problem.

Example 1:
Fatima wanted to buy a TV for her room so she went to purchase one. There were several types with different prices as 8,000 Afs - 5,500 Afs – 6,000 Afs and 4,800 Afs. Can you find out the average price for TV.

Example 2:
Sharifa’s family has an animal farm. They milked 30 liters the first day, 35 liters the second day, 28 liters the third day, 38 liters the fourth day, 30 liters the fifth day, 29 liters the sixth day and 32 liters the seventh day from their farm. Now, you can find the average amount milk their farm can produce in a day.

The Facilitator should make several story questions in order to be discussed and solved by the learners.
EVALUATION ACTIVITY FOR MILESTONE 8

The Facilitator should prepare some cards and write some different numbers on them. Some numbers should be written numerically and some numbers should be written in words.

The cards should be mixed first and then put upside down in front of the learners. Each learner should pick up a card, look at it, if it was written in digits she should read them loud out or if written in words then she should write in digit form on the class-board.
MILESTONE 9: RATIOS

Objectives:
• Explanation of ratio in fraction form
• Equivalent ratio

Description of the Milestone:
The goal of this milestone is for the Learners to know about the relationship between ratios and fractions.

In addition, they should know the ratio of water with powder milk. So a proper amount of milk dissolves with water as consequence of considering ratio. Furthermore, they should know the ratio of water with ORS so they can prepare it correctly.
Milestone 9  
**Activity 1: Ratio Introduction**

**Objective:** to learn the concept of ratio  
**Material:** string, notebook, chalk and class-board

**Activity**

In order to clarify the meaning of ratio, the Facilitator should ask a learner to measure another learner’s height by a string and her head circumference by another string.

Then, the Facilitator should put both strings beside each other in front of the learner and let the learners to compare the both strings and say how many times the height of the learner is bigger than her head circumference.

The learners can measure and compare both strings to find out the ratio between them. Afterwards, the learner would understand the height is 3 times bigger than head circumference.

The Facilitator should ask a learner to come in front of the class and draw both strings on the class-board. Then, everybody can notice that height length is 3 times larger than head circumference.

Next, the Facilitator should ask a learner to measure a second learner’s height by in ‘palms’, counting how many of her (the second learner’s) palms (handspans) equal her height . Then, she should draw them on class-board and compare them. Everybody can notice that height is 8 times larger than palm size.

Ratio of head circumference to height’s length is 1:3 or \( \frac{1}{3} \)

Ratio of palm to height’s length is 1:8 or \( \frac{1}{8} \)

Afterwards, the Facilitator should organize the learners in pairs. Each learner within a group should measure each other’s thumb, neck, head, hand, heel, knee, wrist, elbow and arm and compare them to their height. And then, they should write the results in ratio and fraction forms in a table. Then each group should compare their list with other groups to find out the similarities. Then, they should list those similar parts on the class-board.
Then, the Facilitator should ask each learner one by one to come in front of the class and write body part’s size in fraction and ratio form.

**Note:** The measurement of the learners will not be 100 percent correct, because they do not have the right equipment for measurement.

<table>
<thead>
<tr>
<th>No</th>
<th>Name of body parts</th>
<th>Ratio form</th>
<th>Fraction form</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Head and height</td>
<td>1:3</td>
<td>1 / 3</td>
</tr>
<tr>
<td>2</td>
<td>Palm and height</td>
<td>1:8</td>
<td>1 / 8</td>
</tr>
<tr>
<td>3</td>
<td>Thumb and wrist</td>
<td>1:2</td>
<td>1 / 2</td>
</tr>
<tr>
<td>4</td>
<td>Elbow and height</td>
<td>1:6</td>
<td>1 / 6</td>
</tr>
</tbody>
</table>
Milestone 9
Activity 2: Presenting Ratios in a Graph

Objective: to be able to understand the concept of ratio and present them in a graph
Material: pen, notebook, measuring tape, chalk and class-board

Activity
The Facilitator should draw the following chart and ask the learners to look at it very carefully.

Q: The Facilitator should ask, what does this graph mean?
A: This graph has variety of vegetables name on the bottom and number of people on the right side. As consequence, it presents the ratio of people who likes a certain type of vegetables.

For example:
- Numbers of people who like cauliflower are more then who like cabbage.
- Numbers of people who like eggplant are more then who like tomato

We also can write them as below:

Ratio of people who like cauliflower to cabbage is 10:5 or 10/5
Ratio of people who like eggplant to tomato is 15:20 or 15/20
In other words, 10 percent of people like cauliflower, and 5 percent of people like cabbage. So it means numbers people who like cauliflower are more then those who like cabbage.

Afterward, the Facilitator should organize the learners in groups of 4 persons. Each learner within a group should measure each other’s wrist-elbow and waist by a measuring tape and record them in a chart. When the measuring activity is done, then the learners should present them in ratio form and compare them as below:

Example:
Chart of learners height:

Ratio of the 1st person’s height to the 2nd person height is 200:180 or 200/100
Ratio of 4th person’s height to his waist is 150:90 or 150/90
In this way, the Facilitator writes the ratio of the different parts of each other’s body.
Milestone 9
Activity 3: Writing Ratios

Objective: to become able understand the meaning of ratio as well as how to write them
Material: Picture, notebook, pen, class-board, chalk and other available objects.

Activity

For better understanding, the Facilitator should draw some pictures or hang some photos in front of the class and ask the learners to write their ratio.

For example, there are 4 cages and 8 birds in the following picture.

The ratio of cages to birds is 4:8 or 4/8, so we can put two birds in each cage. So we can write 1/2 = 4/8.

- 4 means number of cages and 8 means number birds
  Or
- 1 means number of cage and 2 means number of birds

Another example:
6/2 = 6:2 or 6/2 = 3/1
We can put 3 flowers in one flowerpot or 6 flowers in two flowerpots. 3/1 = 6/2
Afterwards, each learner should make 3 more examples different from above examples and present them in ratio and fraction forms.
If 1 bottle of water can fill 3 glasses, then how many bottles will fill 6 glasses?

If 1 glass of juice is obtained from 2 lemons, then how many glasses of juices can be obtained from 4 lemons?

The Facilitator should divide the learners into small groups. Then, each group should write ratio from of some available objects such as notebook, pen, pencil and purse.
Milestone 9
Activity 4: Word Problems

Objective: to become able to apply ratios in everyday life
Material: class-board, chalk, notebook and pen

Activity
The Facilitator should organize the learners into small groups and she also should make a few questions related to everyday life for each group. Every group should be given a few questions to think, and find the correct answers. When each group finishes their task, one person from each group, as representative, should come in front of the class and write the correct answers on the class-board. Other learners should copy the correct answers into their notebook.

Examples:

1. In one bottle of Clorin, there are 250 ml. If 5 liter water is disinfected by 1 mg chlorine, then how many liter of water is disinfected by 250 mg of chlorine? Find out the ratio of water to chlorine.
2. If 1 packet ORS should be dissolved in 5 glasses of water, then how much water is needed for 3 packets of ORS?
3. If we use 1 packet of juice powder for 5 guests, how many packet of juice powder should be used for 100 guests?
4. If a person’s body needs 8 liters of water in one day, then how much water does her body need for 6 day and night?

Information for the Facilitator:

Answer 1.
\[
\frac{1}{250} = \frac{5}{x} = \frac{5}{1250}
\]
1,250 liter water is disinfected by 250 mg chlorine

Answer 2.
\[
\frac{1}{3} = \frac{5}{x} = \frac{5}{15}
\]
For 3 pocket of ORS we need 15 glass of water ORS
Answer 3.

\[
\begin{align*}
5 &= 1 \\
100 &= ?
\end{align*}
\]

\[
\begin{array}{c|c|c}
100 & \times & 1 \\
\hline 
100 & & \times \times \\
\end{array}
\]

20 packets of juice powder should be used for 100 guests

Answer 4.

\[
\begin{align*}
2 &= 8 \\
6 &= ?
\end{align*}
\]

\[
\begin{array}{c|c|c}
8 & \times & 6 \\
\hline 
48 & & \times 8 \\
\end{array}
\]

\[
\begin{array}{c|c|c}
48 & \times & 2 \\
\hline 
24 & & \times x \\
\end{array}
\]
Milestone 9
Activity 5: Ratio Relation with Fractions

Objective: to become able to understand the relations between ratio and fraction and present them.

Material: pen, notebook, class-board, chalk, learner book (MS 6)

Activity
The Facilitator should hang different forms of fraction on the class-board, and ask the learners to present them in ratio forms.
The Facilitator should write one or two ratio forms as samples for the learners.

1. 2:1 = 6:3
   Or
   1 / 2 = 3 / 6

The Facilitator should present the ratio forms of the following fraction figures:

Afterwards, the learners should refer to the learner’s book, equivalent fraction, Milestone 6.
The learners should be organized in pairs as the first learner shows a fraction figure to the second learner and the second learner presents it in ratio forms. Then, the second learner shows a fraction number to the first learner, and the first learner presents it in ratio forms. This activity should be done as game.
Milestone 9
Activity 6: More About Ratio

Objective: to understand ratio through doing division and doing more practice
Material: class-board, chalk, notebook and pen

Activity

The Facilitator asks, through what mathematical operation you could find the ratio relation between 2 numbers? The learners should discuss with each other.

Perhaps, the learners would say, through fractions and division we can find the relation of two numbers. The Facilitator should make an example to be solved by the learners.

- There are two classes in our center, section A and section B. Forty-eight students passed the exam successfully in section A and 16 students passed the exam successfully in section B. Can you find out that how many more times the students in section A passed the exam than the students in section B?

The Facilitator explains that we use division to find out the answer. She asks one learner to come in front of the class and solve the problem.

\[ \frac{48}{16} = \frac{16}{3} \]

We see that the number of students who passed the exam in section A is 3 times more then the students in section B.

Next, the Facilitator should organize the learners in pairs and give each group some fake money in order to find out the ratios. For example, Sharifa has 15 Afs, and Karima has 5 Afs. She explains how they can find the ratio of Sharifa’s money to Karima’s money.

\[ \frac{15}{5} = 3 \]

Then, we can say that Sharifa’s money is 3 times more than Karima’s money.

Each group should practice finding the ratio between their money. The Facilitator should check with each group frequently. If any group makes any mistakes she should correct them.
For extra exercise, the learners should estimate the usual monthly expenses of their houses as well as in the month of Ramadan. Then, compare and find out how many times the monthly expenses of Ramadan is than a usual month.
EVALUATION ACTIVITIES FOR MILESTONE 9

Evaluation Activity 1:
The Facilitator should select two learners to measure each other’s height and find out the ratio and record them on the class-board. Or they can find ratio of height to waist, rice to water for cooking, and so on.

Evaluation Activity 2:
Find out how much beef, rice, cabbage and vegetable you need for a month and show their ratio in a chart.

Evaluation Activity 3:
Find out the ratio of the following charts:

The Facilitator should show different fraction figures and the learners should determine the ratios.
MILESTONE 10: DECIMALS

Description of the Milestone:
The goal of this milestone is for the Learners to be able to recognize the decimal symbol and understand the meaning of fractions and decimals. They will also recognize diverse and large decimal numbers and become able to do addition, subtraction, and multiplication with decimal numbers. They will also know the relationship of fractions with decimal numbers and will be able to apply them in real life.
Milestone 10
Activity 1: Fractions and How to Write Numbers Smaller Than One

Objective: to review fractions and understand the relation of fraction with decimal

Material: Paper, notebook, pen, chalk and class-board

Time: 45 minute

Activity
The Facilitator should ask the learners that how can you write a number which is smaller than 1? The Facilitator should give some examples in order to make it more understandable for the learners. Such as:

- The Facilitator should divide a chalk into 3 equal parts. She should take only one part and leave the other two. She asks the learners to write it in fraction form on the board.
- The Facilitator should divide another chalk into 10 equal parts. She should pick only 2 parts and leave the rest. She asks the learners to write it in fraction form on the class board.
- The Facilitator should use two papers which are in the same size. She should divide one paper in 5 equal parts and pick only one piece. Than she should divide the second paper into 10 equal parts and pick only 1 piece. The Facilitator should ask the learners to write them in fraction form on the class board and compare them, which one is bigger and which one is smaller.
- You can use the > and < symbols.

The Facilitator should organize the learners in pairs. Each group should divide a paper into many parts and then write the number of pieces in fraction form into their notebook. Each group should write at least 10 fraction numbers.

Afterward, one person from each group should come in front of the class and write two numbers smaller than 1 in fraction form. Then, another member of the group should come and compare the two numbers and say which one is the larger and which one is the smaller one. The Facilitator should correct the learners’ mistake. Other materials such as tree branches, a loaf of bread and potatoes can be used for this exercise.

When the learners have some objects less than a complete unit such as half, less than a half or more than a half, they should be able to present them by using digits.
Examples:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{1}{4}$ &amp; $\gtrsim$ &amp; $\frac{1}{2}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image1.png" alt="Image" /> &amp; <img src="image2.png" alt="Image" /></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\frac{2}{10}$ &amp; $\lessgtr$ &amp; $\frac{1}{10}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image3.png" alt="Image" /> &amp; <img src="image4.png" alt="Image" /></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\frac{2}{2}$ &amp; $\gtrsim$ &amp; $\frac{1}{2}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image5.png" alt="Image" /> &amp; <img src="image6.png" alt="Image" /></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\frac{2}{4}$ &amp; $\lessgtr$ &amp; $\frac{3}{4}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image7.png" alt="Image" /> &amp; <img src="image8.png" alt="Image" /></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\frac{1}{4}$ &amp; $\lessgtr$ &amp; $\frac{2}{4}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image9.png" alt="Image" /> &amp; <img src="image10.png" alt="Image" /></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\frac{3}{4}$ &amp; $\gtrsim$ &amp; $\frac{1}{4}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image11.png" alt="Image" /> &amp; <img src="image12.png" alt="Image" /></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C10-3
Note for the Facilitator: The learners should copy the figures into their notebooks. The Facilitator can write these figures on the class-board or on the flip chart.
Milestone 10
Activity 2: Fraction Introduction

Objective: to know the concept of decimal fraction and recognize the decimal symbol

Activity

The Facilitator should divide a Paracetamol tablet into two parts and then she asks how would you show half of a tablet in digits (using decimals)? The answer is 0.5
If a tablet is divided into 4 parts, how would you present one part of it in digits?
The answer is 0.25
\[
\frac{1}{4} = 0.25
\]

Word problem:
Frozan’s daughter was sick, so she took her to the doctor. The doctor gave her some tablets. Frozan had to give her daughter half tablet in the morning and half tablet in the evening.
Now, tell how to write half tablet in decimal number. If she gives quarter of a tablet to her daughter, how would you write it in decimal number?
Now, the Facilitator writes various numbers on the class-board, and asks the learners to write them in decimal numbers.

\[
\frac{1}{10} = 0.1
\]

\[
\frac{2}{10} = 0.2
\]

\[
\frac{3}{10} = 0.3
\]
 Afterwards, the Facilitator should ask the learners to write these numbers in place value chart as below:

<table>
<thead>
<tr>
<th>Hundred’s</th>
<th>Ten’s</th>
<th>One’s</th>
<th>Decimal symbol</th>
<th>Tenth’s</th>
<th>Hundredth’s</th>
<th>Thousandth’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>,</td>
<td>7</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>,</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Milestone 10
Activity 3: To Recognize Decimals

Activity
The Facilitator should ask, how do you present half tablet in digits?
What does 0.25 tablets mean?
What does 0.5 tablets mean?
The Facilitator should explain that a decimal system involves counting in units of ten.

<table>
<thead>
<tr>
<th>3</th>
<th>1</th>
<th>7</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>100</td>
<td>1000</td>
<td>10000</td>
</tr>
</tbody>
</table>

We also can write them in this form: 0.3, 0.01, 0.007 and 0.0002.
We can read them, 3 out of 10, 1 out of 100, 7 out of 1000 and 2 out of 10000.
The Facilitator should draw a 100-cell-table on the class board and write those numbers into it as below:

1/10 (1 out of 10) 0.1

2/10 (2 out of 10) 0.2

1/100 (1 out of 100) 0.01
Afterwards, the Facilitator should show the fractions /decimal numbers by using available materials such as chalk, matches, carbon, dough, paper pieces and etc.

\[
\begin{array}{cccc}
\frac{1}{2} & \frac{1}{4} & \frac{2}{3} & \frac{3}{5} \\
\end{array}
\]
<table>
<thead>
<tr>
<th>Figure</th>
<th>What does the figure means?</th>
<th>How do you write it?</th>
<th>How do you read it?</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Figure" /></td>
<td>3 out of 10 is shaded</td>
<td>( \frac{3}{10} = 0.3 )</td>
<td>3 out of 10</td>
</tr>
<tr>
<td><img src="image2" alt="Figure" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image3" alt="Figure" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image4" alt="Figure" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image5" alt="Figure" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image6" alt="Figure" /></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Milestone 10  
Activity 4: Measurement with Centimeter and Millimeter  

Objective:  to use decimal numbers for measurements  
Material:  ruler, pencil, some objects  

Activity  
The Facilitator should organize the learners into pairs. Each group should measure their pencil length and record it into their notebook. For extra practice, the learners should measure objects and record them into their notebook such as eraser, purse, needle, matches, nail, screw and etc.  

Example:  

![Image of a ruler showing a measurement of 2.5 centimeters]

Pencil length = 2.5  

Afterwards, one of the learners should come in front of the class, measure an object with a ruler and write the measurement result on the class-board.  

For extra exercise, the Facilitator should ask the learners to measure their class-mate’s height with a measuring tape and record it on the class-board.  

Perhaps, the learners write 1 meter and 50 centimeter but the Facilitator should instruct them to write 1.50 meter or 1.65 meter and so on.  

The learners should work in group of 2 persons. The first learner should stand backward to the wall and the second learner should leave a ruler over the first learner’s head and make a mark on the wall. The second leaner should measure the length from the ground level to the marked place on the wall.
Milestone 10
Activity 5: Three-Digit Decimal Numbers

Objective: to become able to recognize the larger decimal numbers.
Material: Paper, scissor, notebook, pen, class-board and chalk.

Activity
The Facilitator should divide a paper into 100 equal pieces. Then, the Facilitator shows only one piece of them and explains that this is 1 out of 100 or 1/100. We also can write it 0.01 (0.01)

Afterwards, the Facilitator should ask which is greater, 0.1 or 0.01? (0.1 is greater than 0.01)

The Facilitator should divide the class into 2 groups. One group should read a fraction number (such as 2/100, 3/100, 4/100 and etc) or demonstrate them with pieces of paper, and the other group should write the number on the class board, such as 0.02, 0.03, 0.04 and etc. The Facilitator should keep continuing this activity until every learner takes part.

The learners can practice with 2 digit decimal numbers too such as: 12/100 it means they can take 12 piece of paper out of 100 pieces.
12/100 = 0.12, 25/100 = 0.25 and so on.
Milestone 10
Activity 6: Addition of Decimal Numbers

Objective: to become able to add and subtract decimal numbers
Material: class-board, chalk, notebook and pen

Activity
The Facilitator should organize the learners into group of 4. Each group should be given a decimal addition problem to be discussed and solved. One person from any group, who finished first, should come in front of the class and write the question plus its answer on the class-board. If the learners face any trouble, the Facilitator should help them. Other learner should copy the questions into their notebooks.

Example:

\[
\begin{array}{cccc}
+ & 0.6 & + & 0.4 & + & 0.5 & + & 0.7 \\
0.3 & 0.4 & 0.2 & 0.3 \\
\hline
1.0 \\
\end{array}
\]

The Facilitator should write some word addition questions on piece of papers and leave them upside down in front of the learners. Each group should pick one piece of paper, discuss it in their group and solve it.

Examples:

1. Shukuria needs 10.50 cm fabric for making a mattress, and 12.30 cm fabric for making pillow, how much fabric will she need in total?
2. Hamida needs 170 cm fabric for making clothes for her first kid, 1.10 cm fabric for her second kid, and 70 cm fabric for her third kid, how much fabric does she need in total?
3. Somebody bought 24.60 kg rice, and 70.49 kg flour, how much is the total weight of both objects?
4. Karima told her husband that she need some money to buy 2 item medicines. She has to pay 60.56 Afs for the first item, and 85.42 Afs for her second item, how much money she should take from her husband in total?

Optional questions:
If the learners want extra practice, they can solve the following problems:

\[
\begin{array}{cc}
+ & 107.84 \\
& 12.98 \\
\hline
120.82 \\
\end{array}
\]

\[
\begin{array}{c}
+ & 15.234 \\
\hline
16.297 \\
\end{array}
\]

\[
\begin{array}{c}
+ & 26.897 \\
\hline
27.997 \\
\end{array}
\]
The Facilitator should work a few subtractions questions too. Decimal number subtractions are similar to whole number subtraction. One’s should be written on ones, ten’s should be written on ten’s and hundreds should be written on hundreds. And also each number’s sign should be written right under the upper number’s sign.
Example:

The Facilitator should write some extra subtraction questions on the class-board. And the learners come one after another and solve it. The other learners should copy the questions in their notebook. If the learners face with any trouble the Facilitator should help solve them.
Milestone 10  
Activity 7: Decimal Multiplication

Objective: to become able to multiply decimals  
Material: class-board, chalk, notebook and pen

Activity

The Facilitator should write a decimal number multiplication on the class-board, and organize the learners in groups of 3 to solve the problem. The Facilitator should explain that the decimal number multiplications are similar to whole number multiplication, but what else you have to do is, counting the digits to the right of the decimal in the multiplier and multiplicand, and move the decimal that many places to the left in the final answer.

\[
\begin{array}{c}
4.30 \\
\times 4 \\
\hline
17.20 \\
\end{array}
\]

As we can see, there are 2 digits behind the decimal in the multiplicand number so in the product we have to put the decimal symbol two places to the left (counting from right the right side of the product number.)

Afterwards, the Facilitator should ask what 17.20 means. Then she explains, if there are 4 persons and each person needs 4.30 meter fabric, then, we have to multiply 4.30 by 4 to find out how much fabric we need as below:

\[
4 \times 4.30 = 4.30 + 4.30 + 4.30 + 4.30 = 17.20
\]
Then, the Facilitator organize the learners in groups of 3 persons, and give one question to each group to be practiced and solved. Then, one person from each group as representative should come in front of the class and solve the question on the class-board.

If she makes any mistakes, the other learners should help correct them.
For more practice the Facilitator should give a few more questions to the learners to be solved

Afterward, the Facilitator should give a few more multiplication questions in which the multiplicands and multiplier numbers contains decimal digits, such as below:

\[
\begin{array}{c}
2.3 \\
\times 0.6 \\
\hline
1.38
\end{array}
\]

In case the learners do not know how to solve this kind of multiplication, the Facilitator should explain that the decimal number multiplications are similar to whole number multiplication, but what else you have to do is, counting the decimal digits in multiplicands and multiplier numbers. Whatever decimal digits we find, we should show them in product number. The decimal in product should be count from right to the left and then, placing the symbol according to the number of decimal digits that exist in multiplicands and multiplier numbers.

Example:

\[
\begin{array}{cccc}
0.25 & 3.42 & 5.35 & 12.54 \\
\times 2.5 & \times 1.4 & \times 1.2 & \times 0.2 \\
\hline
\end{array}
\]
EVALUATION ACTIVITIES FOR MILESTONE 10

Evaluation Activity 1
The Facilitator should ask each learner to divide a paper into 10 equal pieces and write their fraction number in their notebook. The Facilitator should check that each learner does it correctly.

Evaluation Activity 2:
The Facilitator should write the following question on several pieces of paper and let each learner pick one and explain it.
Examples: 0.2, 0.02, 1/25, 1/10>2/10, 0.7, 4/10, 19/12 and so on

Evaluation 3:
The Facilitator should organize the learners in groups of two persons. Then she should give a few word problems to each group. The learners should solve the problems within their group. One person from each group should come in front of the class and solve it on the class-board. Whoever comes first is the best.

Examples:
MILESTONE 11: ADVANCED MEASUREMENT

Objectives:
- Measurement of temperature
- Measuring longer distances
- Measuring shorter distances
- Measuring and figuring out the amount of liquid needed for the body.

Description of the Milestone:
Throughout this activity the learners will become familiar with the measurement system. They will learn about the temperature of the body and the method of using thermometer for measuring it. In addition, throughout this activity the learners will learn how to measure long and short distances and understand the time differences between paved and unpaved roads. The learners will become familiar with the instruments by which they can weigh their children and assess their weight.

This milestone also aims at enabling the learners to show their measurements by graphs. They will become able to measure their carpets according to the size of their rooms. The last point that the learners will learn during this activity, is that they will learn get information about the amount of the liquid which is needed for our body.
Milestone 11  
Activity 1: Measuring Temperature with a Thermometer

Objective: The learners will gain information about measurement of the temperature and the usage of a thermometer.  
Material: thermometer, the learners’ books, pen, board and chalk.  
Duration: 45 minutes

Activity:  
Ask the learners: “Can we measure temperature? How? Where have you seen this measuring instrument?” Then ask them: “Can we measure the temperature of the human body? How?”

If the learners answered your questions successfully, that is ok, but if they could not then explain to them:

We can measure the temperature of our body, and the instrument which is used for measuring of the temperature of our body as well as weather and water is called a thermometer. There are two types of thermometer; some of them are smaller and some others are bigger. Some of these thermometers are hung on the walls to measure the coolness or warmth of the rooms. A thermometer is made of glass which has been graded in specified degrees. The starting point for the gradation of the thermometer is 0, the numbers above 0 indicates upper degrees and the numbers below 0 indicates lower degrees.

The inside of the glass tube there is some mercury (Hg). As much as the weather gets warmer, the mercury goes up and much as the weather gets colder, the mercury goes lower. See the picture. The thermometers which are used for the measurement of weather have different shapes and different sizes.

Now, you have to assign the learners to measure the temperature of her classmate sitting beside her. She has to put her hand on the forehead and then on the palm of her hand and see how much is the temperature of her body. They have to give estimated degree.

Then you have to ask them:  
Whose temperature was normal and natural?  
Who had a higher temperature?  
Do you know what the normal temperature of the body is?
After hearing the answers, explain to them: The normal temperature of a human being is 37°C. If the temperature of the body exceeds this degree, the person will have fever and if the temperature is lower than this degree, is also considered to be quite dangerous.

**Note:** If you yourself or the learners have thermometer at home ask them to bring it to the class. You have to show it for the learners and give to each of them to put it one by one under the arms of their fellows and note the temperature. Each of the learners has to write her temperature on the board. Explain that as the weather gets colder, the temperature goes down, closer to 0, and if the degree of the temperature goes below 0, water freezes. If the weather gets warmer, the temperature goes up, and if we reach 100°C, water boils.

In the summer when you keep the water in the freezer, do you know in which degree does it freeze? When you put it out of the freeze in the refrigerator why it does not freeze but it just gets colder? What are the two mentioned degrees in which the water gets colder and then freezes? When you want to make tea, what temperature is needed to boil the water?

<table>
<thead>
<tr>
<th>The normal temperature of the body</th>
<th>37°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>When someone has fever</td>
<td>Above 37°C</td>
</tr>
<tr>
<td>The temperature where water freezes</td>
<td>Below 0°C</td>
</tr>
<tr>
<td>The temperature where water boils</td>
<td>100°C</td>
</tr>
<tr>
<td>Serious and lethal fever</td>
<td>40 – 45 C</td>
</tr>
</tbody>
</table>
Milestone 11
Activity 2: Measurement of Longer Distances

Objective: the learners will be able to measure longer distances
Material: board, chalk, pen and note books

Activity:
Ask the learners: “How far is it from your home to the LFL course?”

Listen to the learners’ answers and then ask: “Do you know far is it from your area to Kabul?” Now ask the learners to make groups and instruct them to discuss about the distance between their area and Kabul. Let them discuss on this issue about 10 minutes and then ask them to tell the results of their estimation for the whole class. In order to help the learners to present more exact answers and them gain more information, explain for them:

A car can traverse a distance of 50km/hr- 60 km/hr on paved roads.

Now divide the class into two groups and give the following distances and ask them to figure out in how many hours does a car traverse these distances?

1- ) the distance between Kabul and Bamiyan: 450 km
2- ) the distance between Kabul and Ghazni: 135 km
3- ) the distance between Kabul and Takhar: 425 km
4- ) the distance between Kabul and Khost: 320 km
5- ) the distance between Kabul and Gardez: 140 km
6- ) the distance between Kabul and Badakhsan: 520km

Note: These distances are just approximate, not exact.

Now ask the learners to discuss among themselves and answer the questions in their notebooks. Then ask a learner from each group to come in front of the class and write the answers of the group on the board. Whichever group writes its answer faster than the other is the winner. Other members of the group should take part in doing this task, not just one person from the group.

Information for the Facilitator:

The answer to question 1:
Since a car travels almost 60 km per hour, therefore in order to traverse 450km, seven 7 hours and 30 minutes is needed.

The answer for the question 2:
The above sum shows that a car can traverse the distance of 135 km about 2 hours and 15 minutes.

The answer for the question 3:

\[
\begin{array}{c|c|c}
425 & 60 \\
420 & 7,8 \\
500 & 7,8 \\
480 & 7,8 \\
20 & \\
\end{array}
\]

A distance of 425 km can be traveled within 7 hours and 50 minutes.

The answer of the question 4:

\[
\begin{array}{c|c|c}
310 & 60 \\
300 & 5,16 \\
100 & 5,16 \\
60 & 5,16 \\
400 & 60 \\
360 & \\
40 & \\
\end{array}
\]

A distance of 310 km can be traversed within 5 hour and 10 minutes.
Milestone 11
Activity 3: The Relationship Between Measurement of Distance and Time

Objective: Through out this activity the learners will be able to measure the distances they travel every day.

Material: board, chalk and the learners’ note books

Duration: 45 minutes

Activity:

Explain for the learners: As you have already learned that how much time it takes to traverse a distance of 200km between Kabul and Ghazni, so now you have to calculate some distances on unpaved roads. When roads are unpaved and there are many ups and down on the hills, how could we figure out the time of traversing distances in such locations? For example if we want to go to Yakawlang from Bamiyan, the roads are rough and unpaved, so in such a case if a car travels a distance of 50-60km/hr on asphalted roads, it might only travel a distance of 35-40km/hr on an unpaved road.

Ask the learners to make pairs and share their ideas about those differences. They have to choose a province for journey and calculate the distances by considering mentioned situation. They have to consider the distance to the mentioned province and find out the time which is needed. After 10 minutes ask a learner from each group to come in front of the board and write the name of their destination, distance and the time in which they have traversed the distance. Then all the pairs should be asked to find the differences in finding the time of travel considering the main differences of the road.

Then ask the learners to calculate the same distance if there is not any vehicle and they ride on a horse/donkey or they walk the same distance. Then they all should be given chance to come in front of the board and write the distance and the time in which they can traverse the mentioned distance.
Milestone 11
Activity 4: Measurement of Weight

Objective: The learners will gain information about the weight of a baby.
Duration: 45 minutes

Activity:
Ask the learners: “Do you know how much a baby should weigh when it is newly born? Do you know much should its weight increase each week?” If the learners could not answer these questions ask them to remember if the clinic weighed their baby after birth, or if they have ever taken their baby to the clinic to be weighed.

When a baby is born it might weigh from 2.5 – 3 kg. If a pregnant woman eats nutritious food during her pregnancy then the baby will have a better weight and she might have an easier birth. If the mother gets less nutritious food, the baby might weigh less.

Now you have to ask the learners: “What do you think is the instrument by which a baby is weighed?” “Could we make such an instrument?” “What things are needed for making it?”

Now ask the learners to make groups of 4 people, deliberate with each other and make a list of their children and include the name, age and weight of their children. In addition, they have to write the increase of the weight of their children during each 6 months and indicate whether the increased weight impacted their height and growth or not.

After each group complete their lists, ask a learner from each group to read that for the class aloud so that others get known with the lists as well.

Information for the Facilitator:
In the first 10 days a baby loses about 300 g weight, but 10 days after birth it will begin to gain about 150-200 g each week. When the baby becomes 6 months old, its weight is the double of its births weight. When a baby reaches one year old, it will have three times the weight at her birth. When the baby becomes 3 years old, she/he may have 15 kg, but the weight of girls at this age is less than boys.
Now the facilitator displays the above mentioned information on a graph as follows:
Ask the learners, what do the clinic workers measure height with? How could we measure our height in home or in the class? After hearing their answers, ask them to prepare a graph for the following measurement information:

The height of a baby is about 40 -50 cm when first born, and when she becomes 2 years old, she may have 85 cm height. When he/she becomes 3 years old, they might have about 95 cm height. A girl, who is 11 years old, has about 147 cm height and the boy in this age might be shorter.

Consider the different seasons of the year and show on a graph the amount of the water which you use each season.
Milestone 11
Activity 5: Measuring for the Carpet of a Room

Objective: Throughout this activity the learners will be able to measure the carpets of their rooms.
Duration: 45 minutes

Activity:
Ask the learners: If we want to buy a carpet/rug for the classroom, how could we measure it so that we can buy carpet for the exact size of our room?

Then ask two of the learners to measure the floor of the room and write the size of the carpet which is required for the room on the board. Ask two other learners to measure once the again the size of the room and they have to find out the size of the stones which can pave the room.

Then ask two other learners to measure the floor of the corridor for buying carpet and two other learners have to find the quantity of stones to pave the mentioned corridor. They can write their measurements on the board. In order to confirm the measurements of the first learners, let the second learners also measure the same place.

Information for the Facilitator:
To measure the size of the carpet for each room, we have to multiply the room’s length by the room’s width. For example, if the length of the room is 6 meters and the width of the room is 3 meters, an 18 meter$^2$ carpet is needed to cover the room.

When we want to pave our room with stone, we count it by square meter. For example if four stones pave one square meter, we calculate the number of stones for a room which has 6 meter length and 3 meter width as follows:

For paving the room (6 meter length and 3 widths) 18 square meters of stone is needed.
To find the number of stones needed for a room which has 3 meter width and 6 meter length, we have:

\[ \frac{\times \ 18}{4} = \frac{72}{4} \]

So we need 72 stones to pave this room.

**Third:**

We need 12 square meter stone for a room which has 2 widths and 6 meter length or (2x6=12).

**Fourth:**

To pave a room which has 7 meter length and 2 meter width, we need 14 square meters of stone, or (14 x 4) 64 stones.
Milestone 11
Activity 6: Our Body’s Need For Water

Objective: The learners become able to understand the amount of water which is needed for their body.
Duration: 45 minutes

Activity:
Ask the learners: How much water do your children drink every day? When your children get thirsty, do you give them enough water for them to drink? Listen to the answers of the learner, and then ask them: Do you think a child needs to drink? Why? Ask from the learners about their children who drink a lot of water and those who drink less water.

After getting the learners’ responses, ask the learners to give information about the quantity of water which is needed normally for children. Instruct the learners to make groups of 4 people and discuss about the amount of water which is required for a person during 24 hours. When they finished their discussion, ask them to present the result of their discussion to the whole class.

If it is possible, put two bunch of flowers in two bottles. Put one of them in a bottle which is filled with water and another is empty. A day later, ask the learners to look at both bunches of flower and see the difference of them and explain what happened.

If the human body does not receive the needed amount of water, the person will get depressed and cannot function as actively as the people who have received the adequate water. Since 70% of the human body is made of water and he/she loses 2.5 L during 24 hours as a result of perspiration and breathing, a human needs to get 2.5 Learner water each 24 hours. The water can be gotten in many ways such as drinking water, tea, liquid foods and the fruits. If a person does not get the required amount of water each day, he/she might have headache, feel dizzy, tired and impatient.

Now you have to prepare a flip chart and write the questions in one column and answers in the other column. Ask the learners to find the answers to the questions which are a bit difficult by deliberating and discussing with each other.

<table>
<thead>
<tr>
<th>Normally how much liter of water is needed for the body?</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much water is need during hot weather for the body?</td>
</tr>
<tr>
<td>When we work hard, how many liters of water re needed for our body?</td>
</tr>
<tr>
<td>When children are growing, how much liter of water is need for their body?</td>
</tr>
<tr>
<td>When a person is sick, how many liters of water are needed for his/her body?</td>
</tr>
</tbody>
</table>
Note: Explain for the learners that during hard work, hot weather and when someone has diarrhea, the body needs more water. When someone has diarrhea, his/her body needs at least 3 liters of water within 24 hours, because they lose a great amount of the body’s liquid each time they go to toilet.
EVALUATION ACTIVITIES FOR MILESTONE 11:

1. What is a thermometer and what is it made of, how does it work?

2. When a person has a fever, what will be the degree of her/his temperature?

3. Can we measure the distance by hour? Give an example.

4. List the foods which you usually eat during pregnancy and the foods which you eat rarely during your pregnancy. If it is difficult to show this by a graph of percentage, write about the food which you use usually.

5. How do we measure the carpet/rug of a room?
MILESTONE 12: TIME AND CALENDAR

Objectives

- To be able to measure time on a calendar
- To be able to find dates and events on a calendar

Description of the Milestone:

The learners will learn the calendar and the tracking of important events in their life on a calendar. The learners should be able to calculate time according to the second, minute, hour, day, week, month and year, and make their daily, weekly, monthly and year plan according to the calendar.
Milestone 12
Activity 1: Recognizing the Date from the Calendar

Objective: The learner should fine the ability to note the date and count the important date form the calendar.
Materials: Calendar, chalk and board

Activity:
The facilitator writes two dates in the board: the beginning of the Learning for Life course and the end of the course.

Example: 3/7/2004 and 12/6/2005. Ask the learners to read the dates and say what time of year those dates are. Maybe the learners say that it’s the time to harvest crops, or it was snowing, or raining, or it was time of making raisins, etc.

In this way the facilitator encourages the learners to remember the above date and asks them different questions, then the learners answer the question according to the calendar.

In every new year there is a new calendar that shows 12 months on it. Whenever we want to note a date we will write it like this:

1.3.1384 : 1384 means the year, 1 means the month and 3 show the day. This means the third day of Hamal, 1384.

Now the facilitator talks about the important event that happened in their village and asks the learners to find them on the calendar and she will write it on the board. For example, on the 22nd of Mezan they dug two wells in our village.
**Information for the Facilitator:**

<table>
<thead>
<tr>
<th>Information about time</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 One minute</td>
<td>60 second</td>
</tr>
<tr>
<td>2 One hour</td>
<td>60 minutes</td>
</tr>
<tr>
<td>3 On day night</td>
<td>24 hours</td>
</tr>
<tr>
<td>4 One month</td>
<td>30 days</td>
</tr>
<tr>
<td>5 One season</td>
<td>3 months</td>
</tr>
<tr>
<td>6 One year</td>
<td>12 months</td>
</tr>
<tr>
<td>7 One year</td>
<td>4 season</td>
</tr>
<tr>
<td>8 One year</td>
<td>365 days</td>
</tr>
<tr>
<td>9 A season</td>
<td>90 to 93 days</td>
</tr>
<tr>
<td>10 One month</td>
<td>4 weeks</td>
</tr>
<tr>
<td>11 One week</td>
<td>7 days</td>
</tr>
<tr>
<td>12 One week</td>
<td>168 hours</td>
</tr>
<tr>
<td>13 One century</td>
<td>100 years</td>
</tr>
</tbody>
</table>
Milestone 12
Activity 2: Introducing the Year, Month and Day

Objective: to understand the year, months, day and counting them with a calendar
Materials: calendar, notebook, pen, board and chalk

Activity:
The facilitator asks the Learners, “How much time do you spend in the kitchen to make lunch?” Perhaps the learners will say two hours, or one hour. The facilitator asks, “How long is one hour? How many hours are in a day? How many hours is one day and night?”

One hour is 60 minutes and one minute is 60 seconds. It means when the learners count from 1 to 60, when they arrive at 60, in fact it is one minute. This mean that saying each word take about one second.

There are 24 hours in one day and night. This means that from 12:00 midnight to 12:00 midnight.

In some seasons of the year the days are longer and in some seasons the nights are longer, but in Hamal and Mezan the nights and days are equal.

One month is 30 days and nights, but some months are 31 days and nights.

The facilitator asks learners, “How many months are in a year? How many months are in a season? How many seasons are there in a year?”

As she gets answers from the learners, she should draw a table on the board and ask one of the learners to come and fill it in. All the learners should participate in the activity.
Milestone 12
Activity 3: Discovering the Calendar and Counting Months and Days

Objectives: The learners will gain information about the discovering of calendar and counting of the days.

Materials: calendar, board, chalk

Time: 45 min

Activity:
The facilitator asks, “Why do we note important dates? And how can we mark or keep track of these dates?”

After the learners have responded to her questions, together with the answer of the learners, she will give the following information for them:

Whenever a family member goes to a trip we note her/his going and coming date, or when we have a job, in order to receive our pay we need to count our days worked, and when a woman is pregnant, in order to know the date of her delivery she has to count the days, or for understanding the first day of the Fast (Ramazan) and or Eid we need to know the dates of the calendar.

People all around the world use different calendars; e.g. the Muslims count their calendars from the emigration of Mohammad from Mecca to Medina and the word of Hijre Shamse (Islamic date) and Hijre Qamare (Islamic date) has come from this of emigration [hijre means ‘migration’].

The first calendar of Islamic history was founded by Omar Farooq. The Hijre Shamse calendar is based on the sun, and Hijre Qamare calendar is based on the moon.

When they wanted to make the history of Islam, the Muslim Asahb keram (companion of Mohammad) and the elder of the tribe made a counsel to discuss this issue. One suggested that we should begin the calendar from the birth of Mohammad, one suggested we must note it from the prophetic mission, another was asking that we should note from the fight of the Muslims. After much discussion, they agreed that the calendar should start from the immigration of Muhammad from Mecca to Medina.

The Facilitator now shows the calendar to the learners, and working in small groups of 4-5 learners, they must use the calendar to find answers to the following questions:

1. Find the date of Mohammad’s (PBUH) birth (Melad Nabe).
2. Find the first day of Eid (Eid-ul-Fetr) in Hijri shamse and Hijri qamare (A.H).
3. Find the first of Jamade-ul-awal (Name of Islamic month) in Hijri shamse (A.H).
4. What is the first month in the Hijri shamse year?
5. What is the first of month in the Hijri Qamare year?
6. Show the 28 Asad on the calendar.
EVALUATION ACTIVITY FOR MILESTONE 12

The Facilitator and learners all stand in a circle. The Facilitator makes a paper ball and asks a question. Then she throws the ball to one of the learners. The learner says the response aloud. When the learner answers the question fast, she will get a top score.

Ask other question then throw the ball to another learner.

Be careful that questions aren’t repeated.

Sample of the Questions
1. How many hours is a day and night?
2. How many days is a week?
3. How many weeks is a month?
4. How many days is a month?
5. How many months is a season?
6. How many seasons is a year?
7. How many months is a year?
8. How many days is a year?
9. How many years is a century?
10. How many minute is an hour?
11. How many seconds is an hour?
12. How many seconds is a minute?
13. 10.5.2005 is which year, which month and which day?