## THE REPUBLIC OF SOUTH SUDAN

## PLEFS PROJECT <br> MATHEMATICS FOR YOUTH LEARNERS



LEARNERS BOOK L1
2016
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## UNIT 1: WHOLE NUMBERS

1.1(a) Counting, reading and writing numbers from 0 to 99



## Exercise 1

Look at the objects in the boxes below. Count and write how many objects are there in each box?
Chairs

| 5 trees |  | 3 boys |
| :---: | :---: | :---: |
| 8 goats <br>  <br> 1011 las 1010 |  |  |
| 9 pencils |  | 8 books |



## Exercise 2

Look at the objects below. How many objects are there of each type?



Exercise 1:

Match the numbers with symbols


1.1 (b) Draw pictures to complete multiples of 10 to 90 . Number 1 has been done for you

| 10 |  |  |
| :--- | :--- | :---: |
| $10 \times$ | $=$ | 10 |
| $10 \times$ | $=$ | 20 |
| $10 \times$ | $=$ | 30 |
| $10 \times$ | $=$ | 40 |
| $10 \times$ | $=$ | 50 |
| $10 \times$ | $=$ | 60 |
| $10 \times$ |  | 70 |
| $10 x$ |  | 80 |
| $10 x$ |  | 90 |

1.1(c) Reading and writing whole numbers from 0 to 99

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

Exercise 4: what are the missing numbers?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  | 12 |  | 14 |  |  | 17 |  |  | 20 |
| 21 |  | 23 |  | 25 | 26 |  |  | 29 | 30 |
| 31 | 32 |  |  | 35 |  |  | 38 |  | 40 |
| 41 |  |  | 44 |  |  | 47 |  | 49 |  |
| 51 |  | 53 |  |  | 56 |  | 58 |  | 60 |
|  | 62 |  |  | 65 |  |  |  | 69 | 70 |
| 71 | 72 | 73 | 74 |  | 76 | 77 | 78 |  | 80 |
| 81 |  | 83 |  | 85 |  | 87 | 88 | 89 | 90 |
| 91 | 92 |  | 94 | 95 | 96 |  | 98 | 99 |  |

1.1 (d) Determine the order of two or more numbers

Example
(a)Find the missing numbers in;
$16,17,18$, 20 $\qquad$
Solution: the missing numbers are:
19, 21, 22.

Exercise 5: Write the missing numbers

1. $4, \ldots . . .6$......, ......., 9, ...., 11
2. .... 40,50 .... 70,80 ...

## 1.1 (e) Identifying the place value of Tens and Ones

## Examples:

a) Tens

| $/$ | Ten |
| :--- | :--- |
| $/ \Gamma$ | Twenty |
| $/ L$ | Thirty |
| $/ L$ | Forty |

a) Tens and Ones
$/=$ tens $/=$ ones

| $/$ | 1 tens and 2 ones $=12$ |
| :--- | :--- |


|  |  |
| :--- | :--- |

Exercise 1: Identify the value represented in the tens and ones place value of the following numbers

1. $32=$ $\qquad$ tens and $\qquad$ ones
2. $98=$ $\qquad$ tens and $\qquad$ ones
3. $48=$ $\qquad$ tens and $\qquad$ ones

## Exercise 2:

Draw the stick bar with two different colors to represent the place value of tens and ones

| Tens and Ones |  |  |
| :--- | :--- | ---: |
| Tens | Ones | Tens |
|  | 1 | Ones |
|  | 2 | 3 |

Fill in the missing numbers

| $57=5$ tens 7 ones |
| :---: |
| $80=8$ tens 0 ones |

$12=1$ tens ___ ones
89 =___ tens ____ones
$51=5$ tens $\qquad$ ones

$$
\ldots=6 \text { tens } 0 \text { ones }
$$

## 1.1 (F) Identifying the value of Hundreds, Tens and Ones using stick figures <br> to fill in the empty boxes

|  | Hundreds | Tens | Ones |
| :--- | :--- | :--- | :--- |
| 234 |  |  |  |
| 123 |  |  |  |
| 320 |  |  | 14 |

## Exercise 1: Write the numbers

1. 1 hundred 7 tens 0 ones $=$ $\qquad$
2. $622=$ $\qquad$ hundreds $\qquad$ tens $\qquad$ ones

## Exercise 2: Write the numbers and the digits

1. 


2.

| $H$ | $T$ | $O$ |
| :--- | :--- | :--- |
| 0 | 0 | 4 |$=$

3. 



## ADDITION

1.2 (a) Addition of 2 single digits numbers

## Put Together (Add)




Add these numbers
$1+3=$
$2+3=$
$4+1=$

Exercise 2: Add in columns


## 1.3 (b) Addition of 3 single-digit number



Exercise 3: Add these numbers

1) $4+3+1=$
2) $6+8+1=$
3) 9

1
$+3$

## 1.2 (c) Addition of multiples of Tens

Add in tens


Exercise 4: Add the numbers

1. $60+20=$
2. $40+20=$

$$
\text { 3. } \begin{array}{rl}
10 & 4.80 \\
+20 & +10
\end{array}
$$

5. 60
$+30$


Exercise 5: add Tens and Ones

1. $40+9=$
2. $90+8=$
3. 50
$+7$
4. 3
$+20$

## 1.2 (e) Addition of 2 digit numbers to 2 digit numbers without

 carrying over

Exercise 6: Add these numbers

1. 24
2. 80
3. 47
4. $44+33=5.24+$ $53=$
$+34$
$+10$
$+20$
1.2 (f) Addition of 2 digit number to 2 digit number with carrying


Exercise 6: Add these numbers

1. 58
2. 36
3. 

54
4. 17
5.
24
$+23$
$\ldots+27$
_
$+39 \quad+57$
$+27$

## SUBTRACTION

1.3 (a) subtraction of single digit numbers vertically and horizontally

Count the birds together. Count the number of birds that remain each time after others fly away.



## 1.3 (b) Subtraction of one diaits from 2 diait numbers

$$
\mid / / / / / / / / 1-1 /=1 / / / / / / / / 1
$$

Exercise 1: subtract 1 digit from 2 digit numbers

1. $15-9=$
2. $16-0=$
3. $18-3=$
4. 49
5. 64

| $-\quad 4$ |
| :--- | $-1$

## 1.3 subtraction of Multiples



Exercise 2: subtract

1. 20
2. 70
3. 40
4. $80-30=$
$5.40-30=$
$-10$
$-60$ $\qquad$ $-20$
$\qquad$
$\qquad$

## 1.3

(d) Subtraction of 2 digit numbers from 2 digits numbers without




## 1.3 (e) Subtraction with borrowing

|  |  |
| :--- | :--- |
| Others example | Methods: subtract ones but 2-7 is possible |
| 62 | Borrow 1 from tens and add to 2 ones to have 12 ones <br> -7 <br> 5 12-7 (ones) $=5$ ones <br> 5 |

## Exercise

1. 94
2. 

63
3. 75
$-8$
_- 9
__ - 47
1.3 (f) Identifying the missing numbers in addition and subtraction


## MULTIPLICATION

1.4 Multiplication of numbers up to 10 by numbers not exceeding 10
1.4 (a) Multiply by 2
$2+2=4$
$2 \times 2=4$
Exer $2+2+2=6$
2.
3. $2 \times 9=$
4. $2 \times 6=$
5. $2 \times 4=$

## 1.5 (b) Multiply by 3



## Exercise 2

1. $3 \times 8=$
2. $3 \times 1=$
3. $3 \times 5=$
4. $3 \times 7=$
5. $3 \times 3=$
1.4 Multiply by 4


Exercise 3

1. $4 \times 2=$
2. $4 \times 4=$
3. $4 \times 9=$
4. $4 \times 2=$
5. $4 \times 6=$
1.4 (d) Multiply by 5


## Exercise 4

1. $5 \times 10=$
2. $5 \times 6=$
3. $5 \times 2=$
4. $5 \times 7=$
5. $5 \times 5=$

Multiply by 6

$$
6+6=12 \quad 6 \times 2=12
$$



Exercise 5

1. $6 \times 7=$
2. $6 \times 8=$
3. $6 \times 6=$
4. 6
$\times 9$
5. 6
$\times 10$
1.5 (f) Multiply by 7


Exercise 6

1. $7 \times 7=$
$2.7 \times 8=$
2. $7 \times 9=$
3. $7 \times 4=$
$5.7 \times 2=$

## 1.4 (g) Multiply by 8



1. $8 \times 8=$
2. $8 \times 9=$
3. $8 \times 3=$
4. $8 \times 6=$
5. $\begin{array}{r}8 \\ \times \quad 3 \\ \hline\end{array}$
1.4(h) Multiply by 9


## Exercise 8

1. $9 \times 9=$
2. $9 \times 7=$
3. $9 \times 4=$
4. $9 \times 5=$
5. 9
$\times 8$
$\qquad$
$\underline{ }$

## 1.4(I) Multiply by 10



1. $10 \times 10=$
2. $10 \times 4=$
3. $10 \times 9=$
4. $10 \times 1=$
5. $10 \times 8=$
1.4 . (j) Multiplication of 2 digit numbers by a 1 digit number with carrying

## Example

$36 \times$
2
72

## Method:

1. Multiply the lower ones by the upper ones $=2 \times 6=12$
2. Write 2 carrying forward 1
3. Multiply the lower ones by the upper tens $=2 \times 3=6$
4. Add the one tens to the $6=1+6=7$

## Exercise 10

1. 58
$\begin{array}{r}1 \\ \times \quad 3 \\ \hline\end{array}$
$\qquad$
2. 49

$$
\times 6
$$

3. 15
$\times 7$

## DIVISION

Division of numbers up to 100 by numbers not exceeding 10
1.5 (a) Division by 2 and 3

| $6 \div 3=2$ | What do you see from this <br> picture? <br> How much cups of milk did each <br> get? |
| :--- | :--- |
| $3 \div 3=1$ | What do you seen in this picture <br> above? <br> How many calves does boy feed? |
| $10 \div 2=5$ | How many pumpkins did each girl |



## Exercise 1

1. $9 \div 3=$
2. $18 \div 9=$
3. $12 \div 3=$
4. $30 \div 3=$
5. $21 \div 7=$

## 1.5 (b) Division of 12 into groups

| $12 \div 2=$ | How many goats are there in each <br> cattle camp? |
| :--- | :--- |
| $12 \div 3=$ | How many teams are there? |



## Exercise 2




## Revision Exercise

## Addition

| 50 | 37 | 23 |
| ---: | ---: | ---: |
| +90 | +46 | +33 |

## Subtraction

| 24 | 28 | 79 |
| ---: | ---: | ---: |
| -13 | -16 | 54 |

Multiplication
45 14 ..... 33
$\times 3$ $\times 5$ $\square \times$ ..... 3
Division
$18 \div 9=$
$26 \div 2=$
$93 \div 3=$

## UNIT 2: MEASUREMENTS

2.1 (a) comparison of Length and Height

Length


Comparing the above 2 sticks;

- Which one is long?
- Which one is short?


Comparing the above two ropes:

- Which one is short?
- Which one is long?


Comparing the above 2 pencils;

- Which is short?
- Which is long?
- Are the same?


## Height



Comparing the above boys:
Who is the tallest?
Who is taller?
Who is shortest?


Comparing the above boy and girl;
Who is short?

Who is tall?


Comparing the above men;

- Who the shortest?
- Who is the tallest?


Comparing the above boy and Girl;

- Who is tall?
- Who is short?
- Are the same?


## Exercise



## From above drawing fill the blank space

a. $\qquad$ is the shortest stick while $\qquad$ is the longest stick
b. $\qquad$ and $\qquad$ are the same length


From the above illustration fill the blank space
a. $\qquad$ and $\qquad$ are the same height
b. $\qquad$ is the tallest while $\qquad$ is the shortest girl.
1.1 (b) Measuring lengths using fixed arbitrary unit parts
a. Measure the palm in the distances shown.

b. A girl measuring her arm with rope (Arm length measure)

c. A man counting his walking steps to measure the distance


These picture show different ways of measuring distance. Practice measuring distances using your strides, fingers, and the arm.

Activity: Mention in other method you use to measure things

## Exercise 2

1. Measure the length of piece of leather with your palm. Compare the results from different learners
2. Measure the rope that you use to tie an animal with your arms. Compare the results
3. Measure distances in your byre between 2 poles using spaces walk. Compare the results

## 2.1 (c) Measuring length with a meter rule

Draw illustration of a boy and a girl measuring the length of ropes for cow using meter rule


Draw illustration of a girl measuring blackboard using meter rule



If you need to measure exact length of an object, you can use meter rule and tape measure. Things are measure in meters and centimeters

1 meter = 100 centimeters
$1 \mathrm{~m}=100 \mathrm{~cm}$

Group Activity:

1. Measure the following:
2. The height of a cow, goat and sheep
3. The length of the ropes for tying your calves
4. Distance between one post and another .
5. The width and length of the PLEFS project gardens
6. Your own height.

Solving problems using currencies (Money)
Money is used in buying and selling. In South Sudan, we use the South Sudanese Pounds.

SSP 1


SSP 5


SSP 10


SSP 25


## SSP 50



SSP 100


10 piasters


20 piasters


50 piasters


Examples:

1) How many 10 piasters have the same value as 50 piasters?
$50 \mathrm{Pt} .=10 \mathrm{Pt} .+10 \mathrm{Pt} .+10 \mathrm{Pt} .+10 \mathrm{Pt} .+10 \mathrm{Pt}$.
$=10 \mathrm{Pt} . \times 5$
Hence there are 5 times 10 Pt . coin in 50 Pt . coin.
2) How many 50 Pt . are there in SSP 25 notes?

SSP $1=2 \times 50 \mathrm{Pt} .=100 \mathrm{Pt}$.
SSP $25=2 \times 50 \times 25$ Pt.
$=50 \times 50 \mathrm{Pt}$.
Therefore there are 50 times 50 Pt . in SSP 25.

| 3) Add: SSP |  | Pt. | We add Pt. column; 50 and 70 Pt . is 120 Pt . |
| :---: | :---: | :---: | :---: |
| 4 | 50 |  | 120 Pt . is $100 \mathrm{Pt} .+20 \mathrm{Pt} .+$ SSP 1 and 20 Pt . |
| +1 | 70 |  | Write 20 Pt. and carry over SSP 1 |
|  |  |  | We get SSP 6 and 20 Pt . |
| 6 | 20 |  |  |

## Exercise

1) Deng went to the market and bought 2 liters of milk for SSP 5, meat for 15 SSP, one loaf of bread for 50 Pt. and salt for 75 Pt. How much money has he spent all together?
2) Wani sold one heap of bananas for 20 Pt . and bucket of mangoes for SSP1 and 80Pt. How much money has he earned altogether?
3) Find the value of SSP 65 and $40 \mathrm{Pt} .+$ SSP 20 and 90 Pt .
4) How many 20 Pt. value are there in SSP 5 ?
5) How many 50 Pt . value is the same amount as SSP 1.

## UNIT 3: GEOMETRY

Sub-unit 1: Geometrical shapes
Exercise.
What is geometry?
This is the branch of mathematics that deals with shapes and properties of shapes and position in a given space/area.

Identifying given geometrical shapes
Modi: A triangle has 3 straight sides. The sides may or may not be equal in length.


Lual: A square has 4 sides all are equal in length.


Jukudu: A rectangular has 4 sides of which the opposite sides are equal in lengths.


Mayom: A circle is a round curved surface with distance from its Centre the same.


Ladu: An oval is a round curved surface with the curved edge not always the same distance from its center


Jada: A right-angled triangle is with one side upright to the other side.


## Exercise

Write the names of these objects


Making patterns: Triangles, Rectangles, Squares, Ovals, cycles

Geometrical bodies can be used to make other bodies like in the following diagrams
1.

2.

3.

5.

4.


## Exercise:

1. Combine a square and a rectangle to make a house diagram
$\qquad$
2. Join 3 squares and one triangle

3. Join a rectangle and upright triangle

4. Join 2 triangles and a square

5. Combine an oval and a rectangle

6. Combine 3 triangles red in colour with one triangle blue in colour.

7. Identify how many sides are there for 5 squares and 2 triangles
8. How many squares and triangles are in this pattern?

9. Join 7 blue triangles and 7 green triangles together. How many triangles are in two such patterns altogether?

10. Draw 5 blue squares and 4 yellow squares in a pattern with one blue in the middle and the four velloy forming a cross with it. How many squares stand or


## Sub-unit 3: Draw geometrical shapes

Drawing geometrical shapes.
Triangles, Rectangles, Squares, Ovals, cycles.
Laku drew the sequence of shapes:
Triangle, square, rectangle.
He wrote the name of each shape and colored them differently.
A triangle has 3 sides and 3 corners

| Shape | Straight sides | Curved edges | Corners |
| :--- | :---: | :---: | :---: |
| Triangle | 3 | 0 | 3 |

## Examples

Draw a triangle, a square, a circle, an oval, and a rectangle. Copy and complete the table below:

| Shape | Straight sides | Curved edges | Corners |
| :--- | :---: | :---: | :---: |
| Triangle | 3 |  |  |
| Square |  |  |  |
| Circle |  | 1 | 0 |
| Oval |  |  |  |
| Rectangle |  |  |  |

## Exercise

1. A triangle has 3 corners. Copy and complete the table below.

| Number of <br> triangle | Total number of <br> corners |
| :---: | :--- |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |


| 7 |  |
| :---: | :--- |
| 8 |  |
| 9 |  |
| 10 |  |

2. A square has 4 corners. Copy and complete the table below:

| Number of <br> square | Total number of <br> corners |
| :---: | :---: |
| 1 | 4 |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 9 |  |
| 10 |  |

## UNIT 4: TELLING TIMES

Sub- unit 1: Tell time in hours
Telling time in hours, half past, quarter past and quarter to the hour

A clock face has three hands; one for the hour which is shorter, the other for the minutes which is longer, and the third one which is thin is for the seconds.


The minute hand moves around the clock face one complete circle in an hour.

The hour hand moves from one number to the next number in an hour.

Tell the time shown in the following clock faces:


1. $\qquad$

2. $\qquad$

3. 


5.


6
9. $\qquad$

## Exercise

1) Draw a clock face showing the time at:
(a) 4 o'clock
(b) 5 o'clock

## Sub-unit 2: Tell time and events of the day

Telling time and events of the day: Morning, evening, noon and night Draw the clock face and fill in the blank spaces.

1. Draw a picture of Garang waking up from sleep at 6 o'clock in the morning.

2. Garang is taking his breakfast at $\qquad$ 7:00am $\qquad$

3. Draw Garang and Wani running to school at8 o'clock.

4. Wani is taking his launch with Nyandeng at 1 o'clock.

5. Draw Kiden with her family taking dinner at 7 o'clock in the evening.

6. Draw Majok and Moje reading and doing their homework at
$\qquad$ 8 $\qquad$ o'clock in the evening.

7. Draw Meling sleeping on the mat at 9 o'clock at night.


Sub-unit 3: Make daily profile
Making daily profile

Draw a chart of daily routing events. This can include: 1) waking up in the morning; going to the school; playing football; visit friends; going to the church on Sunday

Allow the learner to flexibly determine the time for each activities.

## Sub-unit 4: Making activity profiles

Draw a clock and practice telling time for different events in a day by gender.

For example:

| Clock face | Time | Activity | By who? |
| :---: | :---: | :---: | :--- |
|  | 12.35 p.m | Cooking lunch | Women |
|  |  7.00 o'clock to <br> 8.00 o'clock  | Removing the cow <br> dung from cattle <br> camp | Boys |



Add:

1. Taking cows to the water
2. Feeding the calves
3. Fetching water
4. Going to the PLEFS

Draw clock and tell the events.
Which days do you feel learning can take place and for how many hours?
What other weekly events need to be considered? What time do they take place?

Tell events and make a monthly schedule.
Which weeks do you feel PLEFS can go on without interruptions?

Tell events and make a year's calendar for the Cattle camp
e. 9 Which national holidays do you celebrate?

Which months can you go regularly to PLEFS?

Which months you feel it is not possible to have classes?
Tell events and make a seasonal calendar.
e.g when do you move from one camp to the next?

When do you move near or far from the river side?
When can you plant vegetables/ sukuma wiki/okra When can you plant beans/ sorghum?

