Mathematics Syllabus
Grade 2

Learning and Teaching in Grade Two

The Grade Two child has acquired the basics of number, measurement, data handling and shape in Grade One. All these areas of mathematics are now extended. Hopefully the children have enjoyed learning mathematics in Grade One and it is important that this enjoyment continues. The songs, rhymes and games in Grade One should be continued in Grade Two.
It should also be continually emphasized to the children that mathematics is connected with their every day lives and many word problems associated with their home life and their environment should be given.

Mathematics is a hierarchical subject. So the ability to proceed to new work often depends on knowledge of one or more pieces of work that have gone before. If children do not grasp the concepts correctly at this stage they may find problems later. The first thing to do in Grade Two is to revise carefully all the work of Grade One. In Grade Two you will notice that as in Grade One the rate of learning varies greatly from child to child. Whenever a child is seen to have a problem remedial work should be given by making time to help them catch up.

Another important point is that the teaching should be varied at this level. Try to find opportunities to include

- exposition by the teacher;
- discussion between teacher and children and between children themselves;
- appropriate practical work;
- consolidation and practice of fundamental skills;
- problem solving, including the application of mathematics to everyday situations.

The syllabus indicates the contents that should be completed within 150 periods. The number of periods of the year beyond this are at the disposal of the teacher for final revision work, tests and other activities.

The Learning Objectives for Grade Two

In Grade Two all lessons should be directed towards:

- developing the pupil's ability in calculation.
- developing the students' ability in thinking and interpreting.
- enabling students to work neatly and accurately.
- enabling students to apply what they have learned in school to their daily life.
- developing the student's problem solving abilities

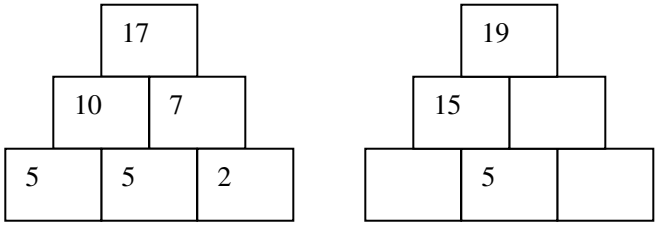
To achieve these life skills objectives the following mathematics learning objectives should be reached by the end of Grade Two. Students should be able to:

- read and write whole numbers up to 1000.
- perform the four fundamental operations on whole numbers up to 100.
- solve simple word problems that lead to addition and subtraction of whole numbers up to 100.
- apply the commutative properties of addition and multiplication on whole numbers up to 100
- identify common ones of length, capacity and weight
- identify fractions ½, ¼, ¾, and 1/3
- recognize common shapes in the environment and draw them
- add and subtract using Ethiopian currency
- read an analogue clock in hours, half hours and quarter hours
- collect and tabulate simple data
- complete and make up patterns
- solve simple problems using the four operations.

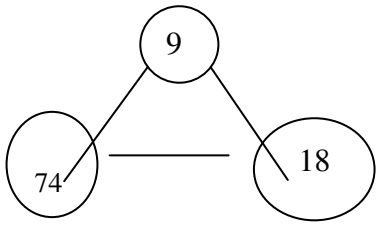
Unit 1: Addition and subtraction up to 100 *(54 periods)*

Unit outcomes: Students will be able to:

- count, read, write, compare and order whole numbers up to 100
- add whole numbers whose sums are less than 100 without and with carrying.
- subtract 1- and 2-digit number from 2-digit numbers without and with borrowing
- identify the relationship between addition and subtraction of numbers.
- solve word problems using addition and subtraction.

Competencies	***Contents***	***Teaching and learning activities and resources***	***Assessment Techniques***
Students will be able to: • count, read and write whole numbers up to 100 • identify places in a place value table in 1s and 10s • compare and order numbers up to 100 • compare whole numbers up to 100 using the symbols "<" , ">" and "=" • calculate the sum of two whole numbers whose sum is less than 20 using the symbols + and = • find the difference of two whole numbers up to 20 using the symbol – and = • solve simple problems and word problems leading to sum and difference of whole numbers up to 20.	***1. Addition and subtraction up to 100*** **1.1 Revision of whole numbers up to 100** *(4 periods)* **1.2 Revision of addition and subtraction up to 20** *(4 periods)*	• Using flash cards, concrete object, the number line and/or abacus students count, read and write numbers up to 100 • Students identify place vale of whole numbers up to 100 • Using the number line students compare and order whole numbers up to 100 • Students continue to compare whole numbers using the symbols • Students revise addition and subtraction up to 20 by using pictures of objects and solving examples in class like completing addition walls like these  • Using addition students compare numbers by using symbols " > ", " < "and "=" like.. 3 + 4 >4 • Helping students to obtain the values of variables by substitution giving them mathematical equation like 5 + = □19	• Ask students to count numbers onward and backwards from a given number up to 100 • Ask students to compare two numbers less than 100 • Ask students to determine sum and difference of whole numbers whose sum is less than 20. • Give word problems and missing number problems using symbols for students to solve like 'Put in the missing symbols for 19 ? 10 ? 9'

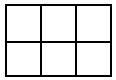
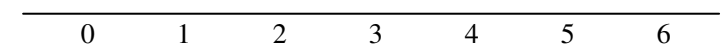
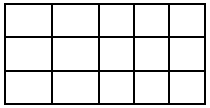
Competencies	*Contents*	*Teaching and learning activities and resources*	*Assessment Techniques*
		• Students solve and make up word problems like. Abebe's father paid income tax 12 birr last month. This month he paid 4 birr more. How much is this month's tax?	
• add a one digit number to a two digit numbers without carrying • subtract a 1-digit number from a 2-digit number without borrowing • justify the result of subtraction problem by means of addition • solve simple word problems using addition/subtraction of one digit number to/ form two digit numbers.	**1.3 Addition and subtraction of a 1-digit number to/from 2-digit numbers without carrying/borrowing** *(7 periods)*	• Students do examples adding a 1-digit number to a 2-digit number like 34 + 5 without carrying • Students do examples subtracting a 1-digit number from a 2-digit number like 39 - 5 without borrowing 39 - 5 = 30 + 9 - 5= 30 + 4 = 34 • Students recognize and use the relationship between addition and subtraction like 35 + 20 = 55 is also 55 – 20 = 35 • Students solve simple word problems that lead to addition or n subtraction 1-digit number to/ from two digit numbers without carrying/borrowing like "Ayele sold 23 eggs in the morning. In the afternoon he sold 4 eggs only. How many eggs did he sell in the whole day?"	• Give students problems of addition/subtraction of one digit number to/from two digit numbers as class and home works and check their work. • You can ask some of the students to solve problems of subtraction on the board by means of addition.
• add 1-digit whole numbers to 2-digit whole numbers with carrying • subtract 1-digit whole numbers from 2-digit whole number with borrowing.	**1.4 Addition/subtraction of a 1-digit number to a 2-digit numbers with carrying/borrowing** *(10 periods)*	• Students add a 1-digit number to a 2-digit number with carrying starting with those whose sum is a multiple of 10 like. 46 + 4 and then continuing like. 57 + 8 begin by using a number line • Students solve and make up simple problems and word problems that lead to such addition. They also solve number trees for addition with 2-digit numbers • Students subtract 1-digit numbers from a 2-digit whole number involving borrowing using examples like.35 - 9 T O 3 5 - 9 2 6 • Allow students to practice the operations through different exercises. • Students solve and make up word problems that lead to such subtraction involving everyday life situations	• give students exercises in adding 1-digit number to a 2-digit number with carrying

Competencies	*Contents*	*Teaching and learning activities and resources*	*Assessment Techniques*
• add two 2-digit whole numbers without carrying • subtract two 2-digit numbers without borrowing • solve and make up word problems leading to addition/ subtraction of 2-digit numbers without carrying/borrowing	**1.5 Addition/subtraction of two 2-digit whole numbers without carrying/borrowing** *(10 periods)*	• Students do examples using addition and subtraction of 2-digit numbers without carrying like 14 + 51 or T O 1 4 + 5 1 • Students solve simple word problems leading to addition of two digit numbers with no carrying. (word problems include issues like environmental protection, saving, tax, etc.)	• Give exercises on addition of two digit whole numbers • Give simple word problems related to students real life using addition and subtraction
• add two 2-digit numbers with carrying • subtract two 2-digit numbers with borrowing	**1.6 Addition/subtraction of a 2-digit number to/from a 2-digit number with carrying/borrowing** *(15 periods)*	• Students add and subtract 2-digit numbers using examples like 74 + 23 = ? and 53 – 14= ? • Students check results of subtraction by addition like. 94 - 37 = 57 because 57 + 37 = 94  • Students solve and make up word problems leading to addition and subtraction of 2-digit numbers.	• Give exercises as a class/home work on subtraction of two digit numbers
• solve and make up simple problems and word problems using addition and subtraction with 2-digit numbers • add three 2-digit numbers • identify subtraction problems which have no solution	**1.7 Word problems involving addition and subtraction up to 100** *(4 periods)*	• Students solve and make up problems using words, symbols, patterns like "I think of a number and then add 35. If my answer is 72 what number did I think of?" Fill in the missing numbers in this pattern 54, 52, - ,48, 44, -. Last month there were 35 registered HIV victims. This month the number of victims has become 47. What is the increment from the last month? • Students discover how to add three 2-digit numbers • Students identify and give reason for subtraction problems that have no solution • Example: 79 - 82, 40 - 70	• Give them some differences of numbers and let them identify those having solution and those with no solutions • Ato Asefa produced 42 hand made pots last week. This week he became ill and produced only 28 pots. How many pots did he miss?

Unit 2: Multiplication and division up to 100 *(40 periods)*

Unit outcomes: Students will be able to:

- multiply and divide whole numbers up to 100 by 2 and 10 without remainder
- multiply by 0 and 1 and divide by 1 whole numbers up to 100
- multiply and divide whole numbers up to 100 by 1-digit numbers and 10
- solve word problems using multiplication and division by 1-digit numbers and 10.

Competencies	*Contents*	*Teaching and learning activities and resources*	*Assessment Techniques*
Students will be able to: • multiply by 2 and 10 up to product 100 • identify and use the symbol x and the mathematical concepts, "factor", "product" • divide up to 100 by 2 and 10 (no remainder) • solve word problems using multiplication and division of 2 and 10	***2. Multiplication and division up to 100*** **2.1 Multiplication and division by 2 and 10, no remainders (revision)** *(10 periods)*	• Students revise multiplication by 2 and 10 using repeated addition and counting unit squares: like 2 + 2 + 2 = 6 3 + 3 = 6 3 x 2 = 6 2 x 3 = 6 2 x 3 = 6  • Students identify and use the terms "factor" and "product" like in 2 x 3 = 6, 2 and 3 are factors and 6 is the product • Students revise division by using repeated subtraction and by dividing an even quantity into 2 equal parts • Students use the number line to assist understanding  0 1 2 3 4 5 6 6 ÷ 2 = 3 • In groups students solve problems of multiplication and division by 2 and 10	• Give exercises on multiplication of numbers up to 20 as home work and check the work. • Give exercises on division up to 20 like 18 ÷ 2 = 9 • Students express the terms for multiplication in a sum
• multiply whole numbers by 0 and 1 • divide whole numbers by 1	**2.2 Multiplication by 0 and 1 and division by1** *(22 periods)*	• Students discuss multiplication by 0 and 1 and conclude with help that any number multiplied by 0 is still 0 while multiplied by 1 or divided remains the same	
• count in 3s, 4s, 5s, 6s, 7s, 8s and 9 up to 100 • multiply up to product 100 1-digit number by 1-digit number • list multiplies of 3, 4, 5, 6, 7, 8 and 9	**2.3 Multiplication and division by 3, 4, 5, 6, 7, 8 and 9** *(8 periods)*	• Show multiplication by 3 using a rectangle of unit squares Eg.  5 5 5 3 × 5 = 15 • Students write and read aloud the multiplication table of 3, 4, 5, 6, 7, 8 and 9	Ask students to multiply numbers by 3, 4, 5 and give their result both orally and in writing while observing them • Ask students to multiply numbers by 6, 7, 8, 9 (orally and in writing)

Competencies	***Contents***	***Teaching and learning activities and resources***	***Assessment Techniques***
• solve simple word problems in multiplication of 1digit number by 1-digit number. • divide numbers up to 100 by 3, 4, 5, 6, 7, 8 and 9 with no remainders • use the relation between multiplication and division for all 1-digit numbers • solve word problems in division by 1- digit numbers		• Students complete missing multiples of 3, 4, 5, 6, 7, 8 and 9 like complete multiples of 3 in 21, 24, ……, 30, 33 and 18, 15, … ,9 • Students count aloud in 3, 4s, 5s, 6, 7, 8 and 9s to 100 • Students solve word problems multiplication like "Last week, a clinic registered 14 HIV cases. This week the number increased five times. How many HIV cases are registered this week?" • Students practice sharing in pairs and groups eg. share 4 pencils equally among 2 children. • Use an abacus to demonstrate division as repeated subtraction • Students divide numbers up to 100 by 3, 4, 5, 6, 7, 8, and 9 no remainder • Students practice sharing in pairs and groups like share 12 sweets equally among 2 children. • Students solve problems in division using the relation between multiplication and division. like Mamo's mother saved a quarter of her monthly salary. This month she saved 9 Birr. What was her monthly salary?	• Ask students to solve division sums by 3, 4, 5, 6, 7, 8 and 9

Unit 3: Measurement *(10 periods)*

Unit outcomes: Students will be able to:

- use the ones centimeter and meter in length
- add and subtract the same unit if length
- use the unit liter in capacity
- add and subtract liters
- use the unit kilogram in weight
- add and subtract kilograms.

Competencies	*Contents*	*Teaching and learning activities and resources*	*Assessment Techniques*
Students will be able to: • measure length using a centimeter ruler • measure using a meter rule • identify the symbols cm and m • explain and show the relation between cm and m	***3. Measurement*** **3.1 Length in cm and m** *(2 periods)*	• Students discuss the need to measure length using standard ones • Students measure lengths of different objects like. pencils or sticks, using a centimetre ruler • Students discuss measuring longer lengths • Students measure longer lengths, like the class room walls, the playground, using a metre rule • Students using a cm ruler and a metre rule discover the relation between them and use their symbols	• ask students to measure length of their desk using a centimetre ruler • Ask students in groups to measure length and breadth of the playground using a metrre rule
• add length using the same unit of length • subtract length using same unit	**3.2 Addition and subtraction of cm or m** *(2 periods)*	• Students using the rules add and subtract lengths in either cm or in m	• Give students word problems on addition and subtraction of length using either cm or m
• measure capacity in litres • compare capacity using litres	**3.3 Capacity in litres** *(1 periods)*	• Let students to bring to school any litre bottles they can find • Students in pairs do exercises measuring the amount of water using different containers use. like how many litres will fill a pail?	• Ask students in groups to measure using a litre bottle the capacity of large containers like a pail
• add capacity in litres • subtract capacity in litres	**3.4 Addition and subtraction in litres** *(2 periods)*	• Students solve problems on capacity using addition and subtraction of litres	• Ask students to solve problems on capacity using addition and subtraction of litres

Competencies	***Contents***	***Teaching and learning activities and resources***	***Competencies***
• measure weight in kilograms • compare weight in kilogram	**3.5 Weight in kilograms** *(1 periods)*	• Bring to school some items which give weight in kilograms like packets of rice or flour and show them to the students • Students measure weight of common items in kilograms using simple scales • students in pairs estimate weight of items like large stones and check using the scales	• Ask students it weigh each other to the nearest kilogram using scales • Ask students to compare the weight of certain objects like stones
• add weight in kilograms • subtract weight in kilograms	**3.6 Addition and subtraction of kilograms** *(2 periods)*	• Students weigh two items using kilogram scales and then add their weights together. • Students solve problems on subtraction of weights of items in kilograms	• Ask students to solve problems on addition of kilograms

Unit 4: Introduction to fractions *(6 periods)*

Unit outcomes: Students will be able to:

- identify halves and quarters
- divide objects into thirds
- show understanding of the relation between whole and halves, quarters and thirds
- write symbolic form of fractions for halves, quarters and thirds.

Competencies	*Contents*	*Teaching and learning activities and resources*	*Assessment Techniques*
Students will be able to: • draw and show halves of concrete objects • draw and show quarters of concrete objects • show the relation between halves and quarters using drawing • add halves and quarters using drawing	***4 Introduction to fractions*** **4.1 Revision of halves and quarters** *(2 periods)*	• Using oranges or similar objects Students cut halves and quarters • Students draw pictures showing halves and quarters and three quarters • Students in pairs discuss and report how many quarters are in a whole and in a half. • Using drawing students add a half and a quarter	• Ask students to draw and shade in one quarter of a circle and then three quarters of a circle • Ask students how many quarters are in a half and in three halves
• draw and show thirds of objects	**4.2 Thirds** *(2 periods)*	• Students draw to show one third and two thirds of a piece of paper	• Ask students to draw divide a circle into thirds • Ask students to show two thirds of a piece of paper
• identify the relation between wholes and halves, quarters and thirds • write the symbols for half, quarters and thirds	**4.3 Wholes and fractions** *(2 periods)* The symbols ½, ¼, ¾ , 1/3, and 2/3	• Students use drawing of halves to show there are 2 halves in a whole • Students divide a piece of paper into quarters and show there are 4 quarters in a whole • Students write the symbols for a half, a quarter, three quarters, a third and two thirds. • Students recognize the symbols ½, ¼, ¾, 1/3 and 2/3	• Ask students how many thirds are in a whole • In class ask some students to come to the board and write the symbols for a half, a quarters, three quarters, one third and two thirds.

Unit 5: Whole numbers up to 1000 *(12 periods)*

Unit outcomes: Students will be able to:

- determine multiples of 100 which are less than 1000.
- read, write the whole numbers form 101 to 1000
- describe the place value of numbers up to 1000
- compare and order whole numbers up to 1000, using the symbols "<",">" and."="

Competencies	***Contents***	***Teaching and learning activities and resources***	***Assessment Techniques***
Students will be able to: • list multiples of 100 up to 1000 • decompose multiples of 100 into addends. • count, read and write multiples of 1000 • add a one digit number to multiples of 100	***5. Whole numbers up to 1000*** **5.1 Multiples of 100.** *(4 periods)*	• Students multiply the whole numbers 1 to 10 by 100 to obtain the multiple of 100 up to 1000. • Students list multiples of 100 and indicate them on the number line. • Students decompose multiples of 100 through examples like 400 = 300 + 100 • Students practise reading and counting aloud multiples of 100 • Students practice adding one digit numbers to different multiples of 100.	• Ask students to list some multiples of 100 orally • Ask students to decompose some multiples of 100. • Ask students to add one digit students to read multiples numbers to the multiples of 100 less than 1000 in writing.
• decompose a three digit number into multiples of 100 and a one digit number.	**5.2 The whole numbers 101-1000** *(4 periods)*	• Students decompose a three digit number in to multiples of 100 and a one-digit number.\ like 405 = 400+5	• Ask students to decompose some three digit numbers into multiples of 100 and ones
• write numbers up to 1000 in place value system.	**5.3 Place value** *(2 periods)*	• Discuss the concept of place value through examples and allow Students to practice on three digit numbers.	• Assist students to describe place values of 3- digit numbers

Competencies	***Contents***	***Teaching and learning activities and resources***	***Assessment Techniques***
• represent numbers up to 1000 on the number line. • determine the number before and the number after a given number up to 1000. • determine numbers between two given numbers • compare two numbers using the symbols ">", "<" and "=".	**5.4 The order of whole numbers up to 1000** *(2 periods)*	• Students represent whole numbers on the number line • Students write down the successor and predecessor of whole numbers. • Students determine the numbers between two given whole numbers. • Students compare two given numbers up to 1000 using the symbols "<", ">" and "=".	• Ask students to represent numbers up to 1000 on number ray. • Ask students to give predecessor and successor of numbers • Give students a pair of numbers which are not successive and let them determine the numbers between them as well as compare them using "<", ">" and "=".

Unit 6: Points, lines and shapes *(14 periods)*

Unit outcomes: Students will be able to:

- draw lines using a ruler
- draw squares, rectangles, triangles and circles
- identify shapes in the environment.

Competencies	*Contents*	*Teaching and learning activities and resources*	*Assessment Techniques*
Students will be able to: • draw lines of given length using a ruler • name lines • draw intersecting lines and name their point of intersection • mark points above, below and on a given line • draw lines through a given point using ruler	***6. Points, lines and shapes*** **6.1 Drawing lines using a ruler** *(5 periods)*	• Students draw straight lines of given lengths using a straight edge or ruler • Students denote points and lines by capital letters • Students draw intersecting lines and name their point of intersection. • Students mark points above, below and on a given line • Students draw lines through a given point using ruler and name it.	• Ask students to draw lines of given length using ruler and check their work. • Ask students to draw intersecting lines and name the point of intersection
• draw a rectangle using a ruler and name it • draw a square of given side length using a ruler and name it • draw a triangle using a ruler and name it • draw a circle using a round object	**6.2 Rectangles, squares, triangles and circles** *(7 periods)*	• Students in pairs show rectangles, squares and triangles by holding a closed string or rope with their fingers • Students practice drawing rectangles, squares and triangles using a ruler • In pairs Students match pictures of everyday objects to rectangles, squares and triangles • Using a coin or other round object Students practice drawing circles	• Ask students to draw a rectangle • Ask students to describe a drawing of rectangles, squares triangles to their neighbour and their neighbour to draw it.
• recognize rectangles, squares, triangles and circles in the environment	**6.3 Shapes in the environment** *(2 periods)*	• Students in groups count how many rectangles, squares, triangles and circles they can find in the classroom and/or the playground	• Ask students to recognize shapes in their home

Unit 7: Money *(4 periods)*

Unit outcomes: Students will be able to:

- add and subtract money using Ethiopian currency
- do role play of shopping using Ethiopian currency.

Competencies	*Contents*	*Teaching and learning activities and resources*	*Assessment Techniques*
Students will be able to: • add Ethiopian currency • subtract Ethiopian currency	***7. Money*** **7.1 Addition and subtraction of money** *(2 periods)*	• Using pictures of coins and notes students add Ethiopian currency • Using pictures of coins and notes students subtract Ethiopian currency	• Ask students to recognize pictures of some Ethiopian coins and notes
• use Ethiopian currency for shopping	**7.2 Shopping** *(2 periods)*	• Students use model money to shop using role play	• Ask students to show a role play of buyer and seller

Unit 8: Time *(4 periods)*

Unit outcomes: Students will be able to:

- tell the time in hours, half hours and quarter hours using an analogue and a digital clock
- describe the relation between hours and minutes.

Competencies	*Contents*	*Teaching and learning activities and resources*	*Assessment Techniques*
Students will be able to: • read an analogue clock in hours, half hours and quarter hours • read a digital clock in hours, half hours and quarter hours	***8. Time*** **8.1 Telling the time in half and quarter hours** *(2 periods)*	• Students draw pictures of analogue clocks showing different times in hours, half hours and quarter hours • Students read the time on digital clocks showing different times in hours, half hours and quarter hours	• Ask students to match pictures of analogous and digital clocks showing time in hours, half hours and quarter hours
• explain the relation between hours and minutes	**8.2 Hours and minutes** *(2 periods)*	• Using an analogue clock with a minute hand students discover the relation between hours and minutes	• Ask students how many minutes are in an hour

Unit 9: Data handling and patterns *(6 periods)*

Unit outcomes: Students will be able to:

- Collect simple data
- Tabulate this data
- Complete and compile simple patterns of shapes and numbers.

Competencies	*Contents*	*Teaching and learning activities and resources*	*Assessment Techniques*
Students will be able to: • Collect simple data • Tabulate collected data • Complete patterns of shape and numbers • Make up patterns of shapes or numbers	***9. Data handling and pattern*** **9.1 Collection of simple data** *(2 periods)* **9.2 A table of simple data** *(2 periods)* **9.3 Simple patterns of numbers and shapes** *(2 periods)*	Using appropriate questions students collect data from their classmates like 'What is your favourite drink?' • Students make a table showing this data clearly • Students complete simple patterns like △△△△△△ ... ... … □○○△□○○△□○○△ ... ... … … 1, 3, 5, ..., ..., ... • [illegible] neighbour to complete them	• Students collect some simple data in class and/or at home • Students make a table of any data they have collected • Ask students to complete patterns of shapes and numbers