

**LESA  
Mathematics Curriculum  
2007**

(NCTM 2000 #1; MO #5 & 9; IL #6)

**1. Number Sense and Operations**

**A. Demonstrate knowledge and use of numbers: representations, systems, and relationships.**

<b><u>Objective</u></b>	<b><u>Suggested Activities</u></b>	<b><u>Suggested Assessment</u></b>
<b>The student will be able to:</b> 1 - understand the place-value structure of the base-ten number system to 100,000 and be able to represent and compare whole numbers.	Students will practice on a place value board.	Teacher observation
2 - recognize equivalent representations for the same number and generate them by decomposing and composing numbers.	Using manipulatives, such as unifix cubes, students group and regroup making various representations of a whole number. For example, $123 = 100 + 20 + 3$ , 12 tens and 3 ones, 3 groups of 41, 10 groups of 12 and 3 ones, $125 - 2$ , etc.	Teacher observation
3 - develop understanding of fractions as parts of unit wholes, as parts of a collection, and as divisions of whole numbers.	Using various manipulatives, students find equal portions to make up a whole.	Teacher observation

Grade level: Third

**LESA  
Mathematics Curriculum  
2007**

**B. Demonstrate knowledge of operations, properties, and their relationships.**

<u>Objective</u>	<u>Suggested Activities</u>	<u>Suggested Assessment</u>
<b>The student will be able to:</b> 1 - add and subtract whole numbers with and without regrouping.	Teacher-directed chalkboard activities	Pre-test, post-test
2 - create number families.		
3 - identify and use the symbols for plus, minus, multiply, divide, greater than, less than, equal.	Teacher instruction, worksheets	Teacher interview and observation
4 - apply commutative, associative, and distributive properties to mathematical equations.	For $32 - 18 = \underline{\quad}$ , use shopping. I have \$32 in my pocket. If I owe the store clerk \$18, and I give her \$20, I still have \$12 in my pocket plus the \$2 change is \$14. For $49 + 49 = \underline{\quad}$ , use manipulatives to change it into $50 + 48$ which is 98. For $5 \times 14 = \underline{\quad}$ , say 5 x10 is 50 and 5x4 is 20, $50 + 20 = 70$ .	Pre-test, post-test
5 - perform simple calculator functions.	Using calculators, students solve teacher created math problems.	Teacher observation

Grade level: Third

**LESA  
Mathematics Curriculum  
2007**

**C. Demonstrate fluency in computation and make appropriate estimates.**

**Objective**

**The student will be able to:**

1 - develop fluency with basic number combinations for multiplication and division and use these combinations to mentally compute related problems, such as  $30 \times 50$ .

2 - develop fluency in adding, subtracting, multiplying, and dividing whole numbers.

3 - develop and use strategies to estimate the results of whole-number computations and to judge the reasonableness of such results.

**Suggested Activities**

Various manipulatives, worksheets, math games

Students use flash cards, dice, and "around the world" activities.

Guess the number of items in a jar.

**Suggested Assessment**

Time tests, Teacher-directed races

Time tests, Teacher-directed races

Check students estimations

Grade level: Third

**LESA  
Mathematics Curriculum  
2007**

4 - select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tool.

Teacher presents problem and students select appropriate method and tool for solving the problem.

Teacher observation

5 - addition and subtraction facts to 20.

Students use flash cards.

Teacher observation

6 - multiplication and division facts to 100 (10x10).

Students use flash cards, and "around the world" activities.

Teacher observation

7 - determine divisibility of 2,5,10.

Using a number chart, students identify multiples of 2,5,10 and recognize the commonality in multiples of 2 (even numbers), 5 (final digit is 5 or 0), 10(final digit is 0).

Teacher observation

**LESA  
Mathematics Curriculum  
2007**

**2. Patterns, Relationships, and Algebraic Methods**

(NCTM 2000 #2; MO #8; IL #8)

**A. Describe numerical relationships using patterns and functions.**

**Objective**

**Suggested Activities**

**Suggested Assessment**

**The student will be able to:**

1 - create, recognize, describe, and extend a wide variety of patterns.

Given a picture of a design of a quilt, describe all the patterns you see. Explain what could be added to the design to generate yet another pattern.

Teacher observation

2 - represent and analyze patterns and functions, using words, tables, and graphs.

Using the constant function on a calculator, construct an input/output table of numbers. Describe the relationships. Graph the results.

Teacher evaluation

**B. Describe numerical relationships using mathematical models.**

**Objective**

**Suggested Activities**

**Suggested Assessment**

**The student will be able to:**

1 - apply properties to mathematical equations: commutative, associative, distributive, identity, and zero.

Students solve problems such as Com:  $3+8=_+3$ ; As:  $(4 \times 5) \times 2 = 4 \times (5 \times 2)$ ; Dis:  $3 \times (6+1) = (3 \times 6) + (3 \times 1)$ ; Id:  $6 \times 1 = 6$ ; Z:  $6+0=6$

Pre-test, post-test

2 - correctly place parenthesis in number sentences.

Give students  $3+2 \times 4=20$ . They need to place parentheses correctly to make it a true statement:  $(3+2) \times 4=20$ .

Teacher evaluation

Grade level: Third

**LESA  
Mathematics Curriculum  
2007**

3 - write fact families and fill in missing number.

Students solve problems such as  $7 + \_ = 9$ .

Student explanation

**C. Analyze, interpret, and solve problems using algebraic concepts and expressions.**

**Objective**

**Suggested Activities**

**Suggested Assessment**

**The student will be able to:**

1 - model problem situations with objects.

Students describe, model, draw, and classify shapes.

Teacher observation

2 - convert English to math sentences.

Give students a set of 'word' problems to translate into number sentences.

Teacher evaluation

3 - use formulas to determine perimeter and area of a rectangle.

Draw everyday objects to find perimeter and area. Determine that length x width = area of a rectangle and  $2l + 2w =$  perimeter of a rectangle.

Teacher evaluation

4 - use representations such as graphs, tables, and equations to draw conclusions.

Students design a graph of number of classmates with blue eyes, brown eyes, hazel eyes, etc. to determine which eye color most students have.

Teacher observation

Grade level: Third

**LESA  
Mathematics Curriculum  
2007**

**D. Analyze change in various contexts.**

**Objective**

**The student will be able to:**

1 - investigate how a change in one variable relates to a change in a second variable.

2 - identify and describe situations with constant or varying rates of change and compare them.

**Suggested Activities**

Student record his/her height over a period of time and determines if there was a change.

Students determine the specific amount of height change and graph it.

**Suggested Assessment**

Student explanation

Student explanation

Grade level: Third

**LESA  
Mathematics Curriculum  
2007**

**3. Geometry**

(NCTM 2000 #3; MO #6; IL #9)

**A. Analyze characteristics and properties of geometric shapes and develop mathematical arguments about geometric relationships.**

**Objective**

**Suggested Activities**

**Suggested Assessment**

**The student will be able to:**

1 - identify, compare, and analyze attributes of two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids.

Students construct Venn diagrams.

Teacher evaluation

2 - classify two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids.

Students sort boxes, cans, and a variety of other shapes into groups.

Teacher observation

3 - investigate, describe, and reason about the results of subdividing, combining, and transforming shapes.

Students use manipulatives such as Tangrams to compose and decompose shapes.

Student explanation

4 - make and test conjectures about geometric properties and relationships and develop logical arguments to justify conclusions.

Students will predict the outcome of their construction and then construct a geometric figure to prove or disprove their prediction.

Student explanation, Teacher observation

Grade level: Third

**LESA  
Mathematics Curriculum  
2007**

**B. Specify locations and describe spatial relationships using representational systems.**

<b><u>Objective</u></b>	<b><u>Suggested Activities</u></b>	<b><u>Suggested Assessment</u></b>
<b>The student will be able to:</b> 1 - describe location and movement using common language and geometric vocabulary.	Students bring in an assortment of boxes and cans and use them to identify terms such as faces, edges, vertices, cylinders, cubes, parallelograms, etc.	Student explanation
2 - make and use coordinate systems to specify locations and to describe paths.	A dog is tied to a 5 meter rope at the middle of the 10 meter long side of a garage. Students make a sketch of the outer path on which the dog can walk. Move the tie post to the corner of the garage. Compare and contrast the outer paths of the two situations.	Student/teacher dialogue
3 - find the distance between points along horizontal and vertical lines of a coordinate system.	Students will construct a coordinate grid on graph paper.	Teacher evaluation

**C. Apply transformations and use symmetry to analyze mathematical situations.**

<b><u>Objective</u></b>	<b><u>Suggested Activities</u></b>	<b><u>Suggested Assessment</u></b>
<b>The student will be able to:</b> 1 - predict and describe the results of sliding, flipping, and turning two-dimensional shapes.	Construct two-dimensional shapes from colored paper to demonstrate slides, flips, and turns.	Teacher and peer evaluation

Grade level: Third

**LESA  
Mathematics Curriculum  
2007**

2 - describe a motion or a series of motions that will show that two shapes are congruent.	Have students use two identical shapes to show congruency after one of them has been moved (flipped, turned, and/or slid).	Teacher observation
3 - identify and describe line and rotational symmetry in two- and three-dimensional shapes and designs.	Fold paper shapes to determine how many lines of symmetry they have (Some shapes may not have any).	Teacher and peer observation

**D. Use visualization, spatial reasoning, and geometric modeling to solve problems.**

<b><u>Objective</u></b>	<b><u>Suggested Activities</u></b>	<b><u>Suggested Assessment</u></b>
<b>The student will be able to:</b> 1 - build and draw geometric objects.	Students construct geometric objects using various media, such as straws, cards, and blocks.	Teacher observation
2 - use geometric models to solve problems in other areas of mathematics, such as number and measurement.	Using the square tiles on the floor, students find the area of the classroom.	Teacher evaluation
3 - recognize geometric ideas and relationships and apply them to situations in their everyday life.	Have students rearrange desks in classroom using various configurations (each desk separate, desks touching, etc.) and discuss the advantages and disadvantages of each.	Teacher/student dialogue

**LESA  
Mathematics Curriculum  
2007**

**4. Measurement**

(NCTM 2000 #4; IL #7)

**A. Determine measurable attributes of objects and the units, systems, and processes of measurement.**

<b><u>Objective</u></b>	<b><u>Suggested Activities</u></b>	<b><u>Suggested Assessment</u></b>
<b>The student will be able to:</b> 1 - measure accurately using a unit of measurement smaller than the object.	Use a ruler to measure the length of a classroom.	Teacher/student dialogue
2 - understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems.	Using an outline of their own foot, students measure and record the length of the teacher's desk and then discuss what a "foot" is and why standard measurement is necessary.	Classroom discussion
3 - understand that measurements are approximations and understand how differences in units affect precision.	Using above activity, discuss accuracy in measurement.	Classroom discussion

Grade level: Third

**LESA  
Mathematics Curriculum  
2007**

**B. Apply appropriate techniques, tools, and formulas to determine measurements.**

<b><u>Objective</u></b>	<b><u>Suggested Activities</u></b>	<b><u>Suggested Assessment</u></b>
<b>The student will be able to:</b> 1 - understand such attributes as length, area, weight, volume, and size of angles and select the appropriate type of unit for measuring each attribute.	Use Hershey kisses to determine volume of a jar. Use water to determine volume of same jar. Discuss accuracy of each unit of measure.	Classroom discussion
2 - select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles.	Using an appropriate tool, students practice accurate measurement techniques. Students measure an object 3 times, record measurements, and explain the importance of accurate technique in measuring.	Teacher/student dialogue
3 - select and use benchmarks to estimate measurements.	Using beans, paper clips, etc., students measure the length of their desks or other objects.	Classroom discussion

**LESA  
Mathematics Curriculum  
2007**

(NCTM 2000 #5; MO #7; IL #10)

**5. Data Analysis and Probability**

**A. Formulate and answer questions by collecting and organizing data and communicate findings.**

<b><u>Objective</u></b>	<b><u>Suggested Activities</u></b>	<b><u>Suggested Assessment</u></b>
<b>The student will be able to:</b> 1 - formulate questions.	During small group discussion, students brainstorm and decide which questions will be used for the survey.	Teacher observation
2 - gather data.	Students survey another classroom (favorite cereal, favorite candy, etc.) and record data.	Teacher observation
3 - construct tables and graphs displaying data.	Using above data, students make graphs of collected data.	Teacher observation of student-made material
4 - read and interpret displays of data.	During classroom discussion, students analyze data presented and draw conclusions. Student will answer questions using the graphed data.	Teacher observation
5 - know the different types of graphs and what type to use (bar, line, pie, picture).	Students discuss which graph is most appropriate for data.	Classroom discussion

Grade level: Third

**LESA  
Mathematics Curriculum  
2007**

**B. Use appropriate statistical methods to analyze data properly.**

**Objective**

**The student will be able to:**

1 - describe parts of the data and the set of data as a whole to determine what the data show.

2 - determine the median of a set of data.

**Suggested Activities**

Survey how many and what kind of pets each student has. Students discuss kind of pet (dog) and what type of pet (beagle).

Students line up according to height. Students determine which student is in the middle (median) in height.

**Suggested Assessment**

Classroom discussion

Teacher observation, classroom discussion

**C. Develop and evaluate inferences and predictions that are based on data.**

**Objective**

**The student will be able to:**

1 - make predictions, given a set of data.

2 - solve problems using graphs, tables, charts, and schedules.

**Suggested Activities**

Over a period of time, chart the number of students in class choosing pizza for hot lunch. Have students predict how many students in class will choose hot lunch the next time pizza is served.

Using the weather reports (TV, Radio, Newspaper, etc.) chart the weather for a week and predict how much water is needed to water the school's garden.

**Suggested Assessment**

Teacher observation

Teacher evaluation

Grade level: Third

**LESA  
Mathematics Curriculum  
2007**

**D. Understand and apply basic concepts of probability.**

**Objective**

**The student will be able to:**

1 - discuss events related to students' experiences as likely or unlikely.

2 - explore concepts of chance.

**Suggested Activities**

Teacher-guided classroom discussion: If you don't study, how likely is it that you will pass the test? How likely is it that you will find a \$100 bill on the sidewalk? How likely is it that you will eat supper tonight? How likely is it that God loves me? etc. (Options: Never, sometimes, always)

Students engage in experiments using spinners, board games, coin flipping, and rolling dice.

**Suggested Assessment**

Classroom discussion

Student explanation

**LESA  
Mathematics Curriculum  
2007**

**6. Discrete Math**

(MO #10)

**A. Apply systematic listing, counting, and reasoning.**

**Objective**

**Suggested Activities**

**Suggested Assessment**

**The student will be able to:**

1 - predict and verify whether the set contains more or fewer of one subset than the other.

Students predict whether the class next door has more girls than boys. Count the girls and the boys.

Teacher observation

2 - explain how subsets of objects are the same or different.

Students categorize subsets according to similar and different characteristics.

Teacher evaluation

3 - apply the concept of "fair division" to real world situations.

Student distributes treats to the class equally and decides what to do with the remainder.

Teacher observation

**B. Apply discrete mathematical modeling using graphs and trees.**

**Objective**

**Suggested Activities**

**Suggested Assessment**

**The student will be able to:**

1 - determine a path through a maze, whether a street network could be traveled going over each street one time, and the shortest distance traveling on a network of roads or streets.

Students will be given a street map to determine shortest traveling distance to a specific location.

Teacher observation

**LESA  
Mathematics Curriculum  
2007**

**C. Use iterative (repetitive) patterns and processes.**

**Objective**

**The student will be able to:**

1 - determine and continue a pattern using inductive reasoning.

**Suggested Activities**

Student constructs ongoing pattern using manipulatives.

**Suggested Assessment**

Teacher observation

**D. Organize and process information.**

**Objective**

**The student will be able to:**

1 - identify and discuss overlapping subsets of objects (Venn diagrams).

**Suggested Activities**

Students will construct Venn diagrams to compare and contrast numbers or objects.

**Suggested Assessment**

Teacher evaluates diagrams.

**E. Find the best solution to the problems using algorithms.**

**Objective**

**The student will be able to:**

1 - compute mathematical problems using a set procedure.

**Suggested Activities**

Students complete various mathematical computations.

**Suggested Assessment**

Teacher evaluation

**LESA  
Mathematics Curriculum  
2007**

(NCTM 2000 #6 & 7a; MO #1 & 3; IL #1)

**7. Problem Solving and Reasoning**

**A. Apply and adapt appropriate strategies to solve problems.**

**Objective**

**Suggested Activities**

**Suggested Assessment**

**The student will be able to:**

1 - use a variety of strategies, such as role play, generating lists, use of manipulatives, equation writing, etc. to solve problems.

Teacher presents a variety of word problems relating to daily living experiences. Students choose a strategy to solve problem.

Classroom discussion

**B. Use reasoning to build new mathematical knowledge through problem solving.**

**Objective**

**Suggested Activities**

**Suggested Assessment**

**The student will be able to:**

1 - explain why an operation would give a correct answer.

Students explain how they arrived at an answer.

Student explanation

2 - recognize the practicality of estimation.

Students determine through estimation if they have enough money to make a purchase.

Teacher evaluation

3 - locate errors in incorrectly worked problems.

Teacher will put incorrect computations on the board and have the class analyze what is wrong.

Teacher evaluation

Grade level: Third

**LESA  
Mathematics Curriculum  
2007**

(NCTM 2000 #7b, 8, & 10; MO #2; IL #2, 3, & 4)

**8. Communication**

**A. Work both cooperatively and individually.**

<u>Objective</u>	<u>Suggested Activities</u>	<u>Suggested Assessment</u>
<b>The student will be able to:</b> 1 - complete a task individually in a positive manner.	Desk work, worksheets, etc.	Teacher observation
2 - actively engage with others in a group activity.	Small group activities	Teacher observation

**B. Represent mathematical data and concepts using a variety of media, including technology.**

<u>Objective</u>	<u>Suggested Activities</u>	<u>Suggested Assessment</u>
<b>The student will be able to:</b> 1 - relate physical materials, pictures, diagrams, and technology to mathematical ideas.	Use manipulatives, such as color tiles, Unifix cubes, etc., to demonstrate the meaning of addition, subtraction, multiplication, and division.	Teacher observation

Grade level: Third

**LESA  
Mathematics Curriculum  
2007**

**C. Analyze, evaluate, and communicate mathematical thinking using the language of mathematics coherently and clearly.**

**Objective**

**The student will be able to:**  
1 - connect mathematical language with everyday language.

**Suggested Activities**

Design a display for temperature, rainfall amounts, and/or growth of a plant.

**Suggested Assessment**

Teacher evaluation

Grade level: Third

**LESA  
Mathematics Curriculum  
2007**

**9. Connections**

(NCTM 2000 #9; MO #4 ; IL #5)

**A. Use technology to access and process information.**

**Objective**

**Suggested Activities**

**Suggested Assessment**

**The student will be able to:**

1 - use the newspapers, computers, etc. to access information about a specific topic.

Use the newspaper to gather information about a teacher-directed topic.

Teacher observation, Class discussion

**B. Understand how mathematical ideas connect internally, among other disciplines, and in daily life to build on one another and produce a coherent whole.**

**Objective**

**Suggested Activities**

**Suggested Assessment**

**The student will be able to:**

1 - use mathematics in other curriculum areas and in daily living.

Read literature and note how mathematics activities arise during the reading of books.

Classroom discussion

2 - recognize relationships among different topics in mathematics.

Create a time line for the history of the school.

Teacher evaluation