LS Mathematics Dept.

Lincoln-Sudbury Mathematics Department Student Expectations

1. Students will participate actively in their own learning.
2. Students will demonstrate proficiency with the mechanics of mathematical problem-solving.
3. Students will demonstrate critical thinking in mathematical problem-solving.
4. Students will communicate mathematically.
5. Students will express mathematical ideas using multiple representations.

Lincoln-Sudbury Academic Expectations

- Students will be able to demonstrate critical thinking and problem solving skills.
- Students will be able to express ideas in many modes.
- Students will be active participants in their own learning.

1. Learning/Academic Expectation:

Students will participate actively in their own learning.

Rubric:

Achievement Level	Student Displays All or Most of These Skills
Exceeds Standard	• Student completes assignments thoroughly and accurately and on time. • Student checks own problem solutions for accuracy using varied strategies. • Student synthesizes examples and information from text and class notes in order to solve problems. • Student makes a concentrated effort to solve a problem without giving up. • Student takes initiative to make corrections on assignments (after being graded) on his or her own. • Student asks and answers questions that deepen his or her own understanding and that of classmates. • When necessary, student seeks help from teacher before assignment is due. • Student comes to class on time completely prepared with paper, pencil, and calculator. • Student takes responsibility for promptly making up any work missed due to an absence.
Meets Standard	• Student completes assignments, usually on time. • Student checks own problem solutions for accuracy using strategies provided in class. • Student follows example problem solutions in text or class notes in order to solve problems. • Student makes corrections on assignments (after being graded) when instructed to do so. • Student asks questions that clarify his or her own understanding. • Student usually comes to class on time prepared with paper, pencil, and calculator. • Student usually takes responsibility for promptly making up any work missed due to an absence

1*(continued)*. Learning/Academic Expectation:
Students will participate actively in their own learning.

Rubric *(continued)*:

In need of improvement	• Student does not consistently complete assignments on time. • Student does not correct own assignments in class or from book. • Student does not make corrections to assignments after they've been graded. • Student does not use strategies to check problem solutions. • Student does not ask appropriate questions which seek to clarify his or her own understanding. • Student often comes to class late or unprepared without paper, pencil, calculator, completed assignments, and/or questions on homework. • Student seldom takes responsibility for making up any work missed due to an absence.

2. Learning/Academic Expectation:

Students will demonstrate proficiency with the mechanics of mathematical problem-solving.

The particular skills a student is expected to master accumulate as a student proceeds through the sequence of math courses. Skills referred to in this rubric are those appropriate to the course in which the student is enrolled and all prerequisite courses.

Rubric:

Achievement Level	Student Displays All or Most of These Skills
Exceeds Standard	• Student solves algebraic equations accurately. • Student is fluent with computation. • Student consistently makes reasonable estimates. • Student performs mathematical mechanics independently, fluidly, and without hesitation on assessments. • Student practices problem solving skills and techniques. • Student knows and can derive (in many cases) mathematical formulas and uses them appropriately. • Student uses appropriate mathematical vocabulary and terminology. • Student uses functions of the graphing and scientific calculator accurately.
Meets Standard	• Student solves algebraic equations accurately. • Student is fluent with computation. • Student usually makes reasonable estimates. • Student practices problem solving skills and techniques at suggestion of teacher. • Student knows mathematical formulas and uses them appropriately. • Student frequently uses appropriate mathematical vocabulary and terminology. • Student uses functions of the graphing and scientific calculator accurately.

2 *(continued)*. Learning/Academic Expectation:

Students will demonstrate proficiency with the mechanics of mathematical problem-solving.

Rubric *(continued):*

In need of improvement	• Student solves algebraic equations with difficulty or only with significant guidance from teacher. • Student is not fluent with computation. • Student does not make reasonable estimates of answers to problems. • Student has not adequately practiced skills. • Student does not know mathematical formulas and does not use them appropriately. • Student does not use correct mathematical vocabulary. • Student has difficulty using functions of graphing and scientific calculator when required to do so.

3. Learning/Academic Expectation:

Students will demonstrate critical thinking in mathematical problem-solving.

Rubric:

Achievement Level	Student Displays All or Most of These Skills
Exceeds Standard	• Student independently identifies elements of an appropriately challenging problem, synthesizes the information, and solves the problem, using a repertoire of problem-solving strategies, including breaking complex tasks into manageable parts. • Student solves multi-step problems. • Student makes connections among mathematical concepts. • Student applies previously learned skills to new concepts. • Student sometimes solves problems using methods that are different from those taught or discussed in class or text.
Meets Standard	• Using techniques taught in class, student identifies elements of an appropriately challenging problem, synthesizes the information, and solves the problem, using a repertoire of problem-solving strategies, including breaking complex tasks into manageable parts. • Student solves multi-step problems. • Student makes connections among mathematical concepts. • Student frequently applies previously learned skills to new concepts. • Student occasionally solves problems using methods that are different from those taught or discussed in class or text.
In need of improvement	• Student does not identify elements of an appropriately challenging problem, does not synthesize the information, and does not solve the problem. • Student struggles when asked to solve multi-step problems. • Student does not make connections among mathematical concepts. • Student does not apply previously learned skills to new concepts. • Student does not use alternate problem-solving strategies.

4. Learning/Academic Expectation:

Students will communicate mathematically.

Rubric:

Achievement Level	Student Displays All or Most of These Skills
Exceeds Standard	• Student's presentation of problem solution is clear, thoughtful, and appropriately detailed. • Student's problem solutions are thoughtful and insightful. • Student makes mathematical arguments about algebraic or geometric relationships. • Student explains problem solution in writing and/or verbally with organized logical steps. • Student gives mathematical justification for steps in a problem solution. • Student answers questions posed by teacher or other students. • Student demonstrates careful reading of questions being asked and instructions given and pursues clarification with appropriate follow-up questions.
Meets Standard	• Student's presentation of problem solution captures the essence of the solution. • Student explains problem solution in writing and/or verbally with organized logical steps. • Student gives mathematical justification for steps in a problem solution. • Student demonstrates understanding of questions being asked and instructions given.
In need of improvement	• Student does not present a problem solution with clarity. • Student does not explain his or her problem solution. • Student does not give mathematical justification for steps in a problem solution. • Student does not read questions and instructions carefully.

5. Learning/Academic Expectation:

Students will express mathematical ideas using multiple representations.

Rubric:

Achievement Level	Student Displays All or Most of These Skills
Exceeds Standard	• Student uses a mathematical model to represent and understand quantitative relationships, and accurately describes the use of the model. • Student accurately interprets graphs and tables to solve mathematical problems and can independently identify trends or discrepancies. • Student designs and draws accurate and representative diagrams and graphs that are appropriate for the exercise. • Student chooses appropriate mode(s) to express a mathematical relationship. • Student expresses a mathematical model in a graph, table, equation and words.
Meets Standard	• Student uses a mathematical model to represent and understand quantitative relationships. • Student accurately interprets graphs and tables to solve mathematical problems. • Student draws accurate and representative diagrams and graphs based on examples. • Given direction, student can express a mathematical model in graph, table, equation or words.
In need of improvement	• Student does not appropriately use mathematical models. • Student does not accurately interpret graphs and tables. • Student does not draw accurate diagrams and graphs. • Student does not understand relationship between a table, graph, equation and words representing the same problem.

The Lincoln-Sudbury Math Department incorporates the expectations of the Massachusetts Curriculum Frameworks into the curricular content of our courses.

Massachusetts Math Curriculum Frameworks

- Understand numbers, ways of representing numbers, relationships among numbers, and number systems.
- Understand meanings of operations and how they relate to one another.
- Compute fluently and make reasonable estimates.
- Understand patterns, relations, and functions.
- Represent and analyze mathematical situations and structures using algebraic symbols.
- Use mathematical models to represent and understand quantitative relationships.
- Analyze change in various contexts.
- Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.
- Specify locations and describe spatial relationships using coordinate geometry and other representational systems.
- Apply transformations and use symmetry to analyze mathematical situations.
- Use visualization, spatial reasoning, and geometric modeling to solve problems.
- Understand measurable attributes of objects and the units, systems, and processes of measurement.
- Apply appropriate techniques, tools, and formulas to determine measurements.
- Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.
- Select and use appropriate statistical methods to analyze data.
- Develop and evaluate inferences and predictions that are based on data.
- Understand and apply basic concepts of probability .