

Northpoint Horizons

CAVS (Content Academic Vocabulary System)
 Correlated to the
 New Jersey State Mathematics Core Curriculum Content Standards

Grade 3

This document provides a sampling of the extensive math directives offered throughout the *CAVS* program that meet the New Jersey Mathematics Core Curriculum Content Standards.

| 4.0 Mathematics Core Curriculum Content Standards | <i>CAVS</i> Math Grades 3-5 Teacher's Guide Examples/Lessons |
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| <p>4.1 Number and Numerical Operations</p> <p>All students will develop number sense and will perform standard numerical operations and estimations on all types of numbers in a variety of ways.</p> | |
| <p>Number Sense</p> | |
| <p>1. Use real-life experiences, physical materials, and technology to construct meanings for numbers (unless otherwise noted, all indicators for grade 3 pertain to these sets of numbers as well).</p> <ul style="list-style-type: none"> • Whole numbers through hundred thousands • Commonly used fractions (denominators of 2, 3, 4, 5, 6, 8, 10) as part of a whole, as a subset of a set, and as a location on a number line | <p>Each lesson uses real-life experiences, physical materials, and technology to make learning meaningful to students. For example: Lesson 4 – <i>Reader Cards, Activity Placemat, and Activity Record Sheet</i> – TG pp. 19-24 <i>How do we make equal groups?</i> Lesson 24 – <i>Concept Poster</i> – TG pp. 139-144 <i>How can you solve problems?</i></p> |
| <p>2. Demonstrate an understanding of whole number place value concepts.</p> | <p>Lesson 1 – TG pp. 1-6 <i>How can you put numbers in order?</i></p> |
| <p>3. Identify whether any whole number is odd or even.</p> | <p>Lesson 1 – TG pp. 1-6 <i>How can you put numbers in order?</i></p> |
| <p>4. Explore the extension of the place value system to decimals through hundredths.</p> | <p>Lesson 6 – TG pp. 31-36 <i>How else can you show less than one whole?</i></p> |
| <p>5. Understand the various uses of numbers.</p> <ul style="list-style-type: none"> • Counting, measuring, labeling (e.g., numbers on baseball uniforms) | <p>CAVS Grades K-2 TG Lesson 1 – TG pp. 1-6 <i>How do you count?</i> Lesson 2 – TG pp. 7-12 <i>What are some kinds of numbers?</i></p> |

| 4.0 Mathematics Core Curriculum Content Standards | CAVS Math Grades 3-5 Teacher's Guide Examples/Lessons |
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| | Lesson 3 – TG pp. 13-18 <i>How do numbers work together?</i> |
| 6. Compare and order numbers. | Lesson 1 – TG pp. 1-6 <i>How can you put numbers in order?</i> Lesson 2 – TG pp. 7-12 <i>How do numbers tell a story?</i> Lesson 4 – TG pp. 19-24 <i>How do we make equal groups?</i> |
| Numerical Operations | |
| 1. Develop the meanings of the four basic arithmetic operations by modeling and discussing a large variety of problems. <ul style="list-style-type: none"> • Addition and subtraction: joining, separating, comparing • Multiplication: repeated addition, area/array • Division: repeated subtraction, sharing | Lesson 2 – TG pp. 7-12 <i>How do numbers tell a story?</i> Lesson 3 – TG pp. 13-18 <i>How do we count large amounts?</i> Lesson 4 – TG pp. 19-24 <i>How do we make equal groups?</i> |
| 2. Develop proficiency with basic multiplication and division number facts using a variety of fact strategies (such as "skip counting" and "repeated subtraction"). | Lesson 3 – TG pp. 13-18 <i>How do we count large amounts?</i> Lesson 4 – TG pp. 19-24 <i>How do we make equal groups?</i> |
| 3. Construct, use, and explain procedures for performing whole number calculations with: <ul style="list-style-type: none"> • Pencil-and-paper • Mental math • Calculator | Lesson 2 – TG pp. 7-12 <i>How do numbers tell a story?</i> Lesson 3 – TG pp. 13-18 <i>How do we count large amounts?</i> Lesson 4 – TG pp. 19-24 <i>How do we make equal groups?</i> |
| 4. Use efficient and accurate pencil-and-paper procedures for computation with whole numbers. <ul style="list-style-type: none"> • Addition of 3-digit numbers • Subtraction of 3-digit numbers • Multiplication of 2-digit numbers by 1-digit numbers | Lesson 2 – TG pp. 7-12 <i>How do numbers tell a story?</i> Lesson 3 – TG pp. 13-18 <i>How do we count large amounts?</i> Lesson 4 – TG pp. 19-24 <i>How do we make equal groups?</i> |
| 5. Count and perform simple computations with money. <ul style="list-style-type: none"> • Cents notation (¢) | Lesson 5 – TG pp 25-30 <i>How do you show that a number is not a whole?</i> |

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| 4.0 Mathematics Core Curriculum Content Standards | CAVS Math Grades 3-5 Teacher's Guide Examples/Lessons |
| 6. Select pencil-and-paper, mental math, or a calculator as the appropriate computational method in a given situation depending on the context and numbers. | Lesson 9 – TG pp. 49-54 <i>How can math rules help you solve equations?</i> |
| 7. Check the reasonableness of results of computations. | Lesson 2 – TG pp. 7-12 <i>How do numbers tell a story?</i> Lesson 22 – TG pp. 127-132 <i>How do you compare facts and information?</i> |
| Estimation | |
| 1. Judge without counting whether a set of objects has less than, more than, or the same number of objects as a reference set. | CAVS Grades K-2 TG Lesson 3 – TG pp. 13-18 <i>How do numbers work together?</i> Lesson 23 – TG pp. 133-138 <i>What do you think will happen?</i> Lesson 24 – TG pp. 139-144 <i>How do we solve problems?</i> |
| 2. Construct and use a variety of estimation strategies (e.g., rounding and mental math) for estimating both quantities and the result of computations. | Lesson 1 – TG pp. 1-6 <i>How can you put numbers in order?</i> Lesson 23 – TG pp. 133-138 <i>Do you think it will happen?</i> |
| 3. Recognize when an estimate is appropriate, and understand the usefulness of an estimate as distinct from an exact answer. | Lesson 23 – TG pp. 133-138 <i>Do you think it will happen?</i> Lesson 24 – TG pp. 139-144 <i>How can you solve problems?</i> |
| 4. Use estimation to determine whether the result of a computation (either by calculator or by hand) is reasonable. | Lesson 23 – TG pp. 133-138 <i>Do you think it will happen?</i> Lesson 24 – TG pp. 139-144 <i>How can you solve problems?</i> |
| 4.2 Geometry and Measurement | |
| All students will develop spatial sense and the ability to use geometric properties, relationships, and measurement to model, describe and analyze phenomena. | |
| Geometric Properties | |
| 1. Identify and describe spatial relationships of two or more objects in space. <ul style="list-style-type: none"> • Direction, orientation, and perspectives (e.g., which object is on your left when you are standing here?) | CAVS Grades K-2 TG Lesson 11 – TG pp. 61-66 <i>How far? How long?</i> Lesson 16 – TG pp. 91-96 <i>Where are you?</i> |

| 4.0 Mathematics Core Curriculum Content Standards | CAVS Math Grades 3-5 Teacher's Guide Examples/Lessons |
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| <ul style="list-style-type: none"> Relative shapes and sizes | Lesson 17 – TG pp. 97-102 <i>Where are you now?</i> Lesson 18 – TG pp. 103-108 <i>Which way do you go?</i> CAVS Grades 3-5 TG Lesson 16 – TG pp. 91-96 <i>How do we describe shapes with straight sides?</i> Lesson 17 – TG pp. 97-102 <i>How do we describe shapes with three sides?</i> |
| 2. Use properties of standard three-dimensional and two-dimensional shapes to identify, classify, and describe them. <ul style="list-style-type: none"> Vertex, edge, face, side, angle 3D figures - cube, rectangular prism, sphere, cone, cylinder, and pyramid 2D figures - square, rectangle, circle, triangle, pentagon, hexagon, octagon | Lesson 16 – TG pp. 91-96 <i>How do we describe shapes with straight sides?</i> Lesson 17 – TG pp. 97-102 <i>How do we describe shapes with three sides?</i> Lesson 19 – TG pp. 109-114 <i>What attributes do solid shapes share?</i> |
| 3. Identify and describe relationships among two-dimensional shapes. <ul style="list-style-type: none"> Same size, same shape Lines of symmetry | Lesson 16 – TG pp. 91-96 <i>How do we describe shapes with straight sides?</i> Lesson 18 – TG pp. 103-108 <i>How do we draw different shapes?</i> |
| 4. Understand and apply concepts involving lines, angles, and circles. <ul style="list-style-type: none"> Line, line segment, endpoint | Lesson 16 – TG pp. 91-96 <i>How do we describe shapes with straight sides?</i> Lesson 17 – TG pp. 97-102 <i>How do we describe shapes with three sides?</i> |
| 5. Recognize, describe, extend, and create space-filling patterns | Lesson 7 – TG pp. 37-42 <i>What is a pattern?</i> |
| Transforming Shapes | |
| 1. Describe and use geometric transformations (slide, flip, turn). | Lesson 20 – TG pp. 115-120 <i>How can you change shapes?</i> |
| 2. Investigate the occurrence of geometry in nature and art. | Lesson 16 – TG pp. 91-96 <i>How do we describe shapes with straight sides?</i> Lesson 20 – TG pp. 115-120 <i>How can you change shapes?</i> |
| Coordinate Geometry | |

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| 4.0 Mathematics Core Curriculum Content Standards | CAVS Math Grades 3-5 Teacher's Guide Examples/Lessons |
| 1. Locate and name points in the first quadrant on a coordinate grid. | Lesson 8 – TG pp. 43-48 <i>How can you use models?</i> |
| Units of Measurement | |
| 1. Understand that everyday objects have a variety of attributes, each of which can be measured in many ways. | Lesson 10 – TG pp. 55-60 <i>What do you use to measure things?</i> Lesson 11 – TG pp. 61-66 <i>How do you measure?</i> Lesson 12 – TG pp. 67-72 <i>How do you measure flat shapes?</i> Lesson 13 – TG pp. 73-78 <i>How do you measure solid shapes?</i> |
| 2. Select and use appropriate standard units of measure and measurement tools to solve real-life problems. <ul style="list-style-type: none"> • Length - fractions of an inch (1/4, 1/2), mile, decimeter, kilometer • Area - square inch, square centimeter • Weight - ounce • Capacity - fluid ounce, cup, gallon, milliliter | Lesson 10 – TG pp. 55-60 <i>What do you use to measure things?</i> Lesson 11 – TG pp. 61-66 <i>How do you measure?</i> Lesson 12 – TG pp. 67-72 <i>How do you measure flat shapes?</i> Lesson 13 – TG pp. 73-78 <i>How do you measure solid shapes?</i> Lesson 14 – TG pp. 79-84 <i>What are units of measurement?</i> |
| 3. Incorporate estimation in measurement activities (e.g., estimate before measuring). | Lesson 10 – TG pp. 55-60 <i>What do you use to measure things?</i> Lesson 13 – TG pp. 73-78 <i>How do you measure solid shapes?</i> |
| Measuring Geometric Objects | |
| 1. Determine the area of simple two-dimensional shapes on a square grid. | Lesson 12 – TG pp. 67-72 <i>How do you measure flat shapes?</i> |
| 2. Determine the perimeter of simple shapes by measuring all of the sides. | Lesson 12 – TG pp. 67-72 <i>How do you measure flat shapes?</i> |
| 3. Measure and compare the volume of three-dimensional objects using materials such as rice or cubes. | Lesson 13 – TG pp. 73-78 <i>How do you measure solid shapes?</i> Lesson 19 – TG pp. 109-114 <i>What attributes do solid shapes share?</i> |
| 4.3 Patterns and Algebra | |
| All students will represent and analyze relationships among variable quantities and solve problems involving patterns, functions, and algebraic concepts and processes. | |

| 4.0 Mathematics Core Curriculum Content Standards | CAVS Math Grades 3-5 Teacher's Guide Examples/Lessons |
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| Patterns | |
| 1. Recognize, describe, extend, and create patterns. <ul style="list-style-type: none"> • Descriptions using words and number sentences/expressions • Whole number patterns that grow or shrink as a result of repeatedly adding, subtracting, multiplying by, or dividing by a fixed number (e.g., 5, 8, 11, . . . or 800, 400, 200, . . .) | Lesson 7 – TG pp. 37-42 <i>What is a pattern?</i> |
| Functions and Relationships | |
| 1. Use concrete and pictorial models to explore the basic concept of a function. <ul style="list-style-type: none"> • Input/output tables, T-charts | Lesson 8 – TG pp. 43-48 <i>How can you use models?</i> |
| Modeling | |
| 1. Recognize and describe change in quantities. <ul style="list-style-type: none"> • Graphs representing change over time (e.g., temperature, height) | Lesson 8 – TG pp. 43-48 <i>How can you use models?</i> Lesson 10 – TG pp. 55-60 <i>What do you use to measure things?</i> |
| 2. Construct and solve simple open sentences involving addition or subtraction (e.g., $3 + 6 = \underline{\quad}$, $n = 15 - 3$, $3 + \underline{\quad} = 3$, $16 - c = 7$). | Lesson 9 – TG pp. 49-54 <i>How can math rules help you solve equations?</i> |
| Procedures | |
| 1. Understand and apply the properties of operations and numbers. <ul style="list-style-type: none"> • Commutative (e.g., $3 \times 7 = 7 \times 3$) • Identity element for multiplication is 1 (e.g., $1 \times 8 = 8$) • Any number multiplied by zero is zero | Lesson 2 – TG pp. 7-12 <i>How do numbers tell a story?</i> Lesson 3 – TG pp. 13-18 <i>How do we count large amounts?</i> Lesson 9 – TG pp. 49-54 <i>How can math rules help you solve equations?</i> |
| 2. Understand and use the concepts of equals, less than, and greater than to describe relations between numbers. <ul style="list-style-type: none"> • Symbols ($=$, $<$, $>$) | CAVS Grades K-2 TG Lesson 3 – TG pp. 13-18 <i>How do numbers work together?</i> |

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| 4.0 Mathematics Core Curriculum Content Standards | CAVS Math Grades 3-5 Teacher's Guide Examples/Lessons |
| 4.4 Data Analysis, Probability, and Discrete Mathematics All students will develop an understanding of the concepts and techniques of data analysis, probability, and discrete mathematics, and will use them to model situations, solve problems, and analyze and draw appropriate inferences from data. | |
| Data Analysis or Statistics | |
| 1. Collect, generate, organize, and display data in response to questions, claims, or curiosity. <ul style="list-style-type: none"> Data collected from the classroom environment | Lesson 21 – TG pp. 121-126 <i>Why do you need information?</i> Lesson 22 – TG pp. 127-132 <i>How do you compare facts and information?</i> |
| 2. Read, interpret, construct, analyze, generate questions about, and draw inferences from displays of data. <ul style="list-style-type: none"> Pictograph, bar graph, table | Lesson 21 – TG pp. 121-126 <i>Why do you need information?</i> Lesson 22 – TG pp. 127-132 <i>How do you compare facts and information?</i> |
| Probability | |
| 1. Use everyday events and chance devices, such as dice, coins, and unevenly divided spinners, to explore concepts of probability. <ul style="list-style-type: none"> Likely, unlikely, certain, impossible More likely, less likely, equally likely | Lesson 23 – TG pp. 133-138 <i>Do you think it will happen?</i> Lesson 24 – TG pp. 139-144 <i>How can you solve problems?</i> |
| 2. Predict probabilities in a variety of situations (e.g., given the number of items of each color in a bag, what is the probability that an item picked will have a particular color). <ul style="list-style-type: none"> What students think will happen (intuitive) Collect data and use that data to predict the probability (experimental) | Lesson 23 – TG pp. 133-138 <i>Do you think it will happen?</i> Lesson 24 – TG pp. 139-144 <i>How can you solve problems?</i> |
| Discrete Mathematics—Systematic Listing and Counting | |
| 1. Represent and classify data according to attributes, such as shape or color, and relationships. <ul style="list-style-type: none"> Venn diagrams Numerical and alphabetical order | Lesson 21 – TG pp. 121-126 <i>Why do you need information?</i> |

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| 4.0 Mathematics Core Curriculum Content Standards | CAVS Math Grades 3-5 Teacher's Guide Examples/Lessons |
| 2. Represent all possibilities for a simple counting situation in an organized way and draw conclusions from this representation. <ul style="list-style-type: none"> Organized lists, charts | Lesson 21 – TG pp. 121-126 <i>Why do you need information?</i> Lesson 22 – TG pp. 127-132 <i>How do you compare facts and information?</i> |
| Discrete Mathematics—Vertex-Edge Graphs and Algorithms | |
| 1. Follow, devise, and describe practical sets of directions (e.g., to add two 2-digit numbers). | Lesson 2 – TG pp. 7-12 <i>How do numbers tell a story?</i> Lesson 24 – TG pp. 139-144 <i>How can you solve problems?</i> |
| 2. Explore vertex-edge graphs <ul style="list-style-type: none"> Vertex, edge Path | Lesson 17 – TG pp. 97-102 <i>How do we describe shapes with three sides?</i> |
| 3. Find the smallest number of colors needed to color a map. | Lesson 6 – TG pp. 31-36 <i>How else can you show less than one whole?</i> |
| 4.5 Mathematical Processes | |
| All students will use mathematical processes of problem solving, communication, connections, reasoning, representations, and technology to solve problems and communicate mathematical ideas. | |
| Problem Solving | |
| 1. Learn mathematics through problem solving, inquiry, and discovery. | Lesson 9 – TG pp. 49-54 <i>How can math rules help you solve equations?</i> Lesson 24 – TG pp. 139-144 <i>How can you solve problems?</i> |
| 2. Solve problems that arise in mathematics and in other contexts (cf. workplace readiness standard 8.3). <ul style="list-style-type: none"> Open-ended problems Non-routine problems Problems with multiple solutions Problems that can be solved in several ways | Lesson 22 – TG pp. 127-132 <i>How do you compare facts and information?</i> Lesson 23 – TG pp. 133-138 <i>Do you think it will happen?</i> Lesson 24 – TG pp. 139-144 <i>How can you solve problems?</i> |
| 3. Select and apply a variety of appropriate problem-solving strategies (e.g., "try a simpler problem" or "make a diagram") to solve problems. | Lesson 24 – TG pp. 139-144 <i>How can you solve problems?</i> |

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| 4. Pose problems of various types and levels of difficulty. | Lesson 24 – TG pp. 139-144 <i>How can you solve problems?</i> |
| 5. Monitor their progress and reflect on the process of their problem solving activity. | Lessons 1-24 Each lesson has a <i>Lesson Review</i> page for teachers to monitor progress and problem solving activity. |
| Communication | |
| 1. Use communication to organize and clarify their mathematical thinking. <ul style="list-style-type: none"> • Reading and writing • Discussion, listening, and questioning | Lessons 1-24 <i>Whole Group, Small Group, and Paired Activities</i> |
| 2. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others, both orally and in writing. | Lessons 1-24 <i>Whole Group, Small Group, and Paired Activities</i> |
| 3. Analyze and evaluate the mathematical thinking and strategies of others. | Lessons 1-24 <i>Paired Activities</i> |
| 4. Use the language of mathematics to express mathematical ideas precisely. | Lessons 1-24 <i>Paired Activities</i> |
| Connections | |
| 1. Recognize recurring themes across mathematical domains (e.g., patterns in number, algebra, and geometry). | Lesson 1 – TG pp. 1-6 <i>How can you put numbers in order?</i> Lesson 7 – TG pp. 37-42 <i>What is a pattern?</i> Lesson 19 – TG pp. 109-114 <i>What attributes do solid shapes share?</i> |
| 2. Use connections among mathematical ideas to explain concepts (e.g., two linear equations have a unique solution because the lines they represent intersect at a single point). | Lesson 8 – TG pp. 43-48 <i>How can you use models?</i> |
| 3. Recognize that mathematics is used in a variety of contexts outside of mathematics. | Lesson 15 – TG pp. 85-90 <i>How long does it take?</i> Lesson 23 – TG pp. 133-138 <i>Do you think it will happen?</i> |
| 4. Apply mathematics in practical situations and in other disciplines. | Lesson 10 – TG pp. 55-60 <i>What do you use to measure things?</i> Lesson 15 – TG pp. 85-90 <i>How long does it take?</i> |

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| 5. Trace the development of mathematical concepts over time and across cultures (cf. world languages and social studies standards). | Lesson 11 – TG pp. 61-66 <i>How do you measure?</i> Lesson 14 – TG pp. 79-84 <i>What are units of measurement?</i> |
| 6. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole. | Lesson 9 – TG pp. 49-54 <i>How can math rules help you solve equations?</i> |
| Reasoning | |
| 1. Recognize that mathematical facts, procedures, and claims must be justified. | Lesson 3 – TG pp. 13-18 <i>How do we count large amounts?</i> Lesson 4 – TG pp. 19-24 <i>How do we make equal groups?</i> |
| 2. Use reasoning to support their mathematical conclusions and problem solutions. | Lesson 24 – TG pp. 139-144 <i>How can you solve problems?</i> |
| 3. Select and use various types of reasoning and methods of proof. | Lesson 22 – TG pp. 127-132 <i>How do you compare facts and information?</i> |
| 4. Rely on reasoning, rather than answer keys, teachers, or peers, to check the correctness of their problem solutions. | Lesson 11 – TG pp. 61-66 <i>How do you measure?</i> Lesson 23 – TG pp. 133-138 <i>Do you think it will happen?</i> |
| 5. Make and investigate mathematical conjectures. <ul style="list-style-type: none"> • Counterexamples as a means of disproving conjectures • Verifying conjectures using informal reasoning or proofs. | Lesson 23 – TG pp. 133-138 <i>Do you think it will happen?</i> |
| 6. Evaluate examples of mathematical reasoning and determine whether they are valid. | Lesson 2 – TG pp. 7-12 <i>How do numbers tell a story?</i> Lesson 9 – TG pp. 49-54 <i>How can math rules help you solve equations?</i> |
| Representations | |
| 1. Create and use representations to organize, record, and communicate mathematical ideas. <ul style="list-style-type: none"> • Concrete representations (e.g., base-ten blocks or algebra tiles) • Pictorial representations (e.g., diagrams, charts, or tables) • Symbolic representations (e.g., a formula) • Graphical representations (e.g., a line graph) | Lesson 16 – TG pp. 91-96 <i>How do we describe shapes with straight sides?</i> Lesson 17 – TG pp. 97-102 <i>How do we describe shapes with three sides?</i> Lesson 21 – TG pp. 121-126 <i>Why do you need information?</i> |

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| 2. Select, apply, and translate among mathematical representations to solve problems. | Lesson 4 – TG pp. 19-24 <i>How do we make equal groups?</i> Lesson 6 – TG pp. 31-36 <i>How else can you show less than one whole?</i> |
| 3. Use representations to model and interpret physical, social, and mathematical phenomena. | Lesson 8 – TG pp. 43-48 <i>How can you use models?</i> |
| Technology | |
| 1. Use technology to gather, analyze, and communicate mathematical information. | The skills and practices taught in each lesson of CAVS can easily transition to computer, calculator, and technology laboratory. Students transfer learning from the lesson to the technology process after achievement of appropriate skill level. For example: Lesson 20 – TG pp. 115-120 <i>How can you change shapes?</i> Lesson 21 – TG pp. 121-126 <i>Why do you need information?</i> |
| 2. Use computer spreadsheets, software, and graphing utilities to organize and display quantitative information. | |
| 3. Use graphing calculators and computer software to investigate properties of functions and their graphs. | |
| 4. Use calculators as problem-solving tools (e.g., to explore patterns, to validate solutions). | |
| 5. Use computer software to make and verify conjectures about geometric objects. | |
| 6. Use computer-based laboratory technology for mathematical applications in the sciences. | |