

Computer Integrated Mathematics

The objective of this course is to integrate technology and mathematics in a practical way. Students are exposed to real world technologies and situations and learn to apply their mathematics knowledge. Students continue to improve and learn mathematical skills for their post high school years.

Content Strands :

Numbers and Operations
Geometry and Measurement
Functions and Algebra

Process Strands :

Problem-solving, Reasoning , and Proof
Communications, Representations, and Connections

MAJOR STEMS:

Introduction – Technical Drafting
Tessellations and Transformations
Bridge Building
Graphic Design
Animation
Architecture Design
Civil Design

Computer Integrated Mathematics COURSE COMPETENCIES

1. Demonstrates understanding of real numbers
2. Uses a variety of mental computation strategies to solve problems
3. Makes estimates
4. Uses properties of angle relationships

5. Applies the concepts of congruency
6. Applies the concepts of similarity
7. Solves problems involving perimeter, circumferences, or area
8. Uses the units of measure appropriately and consistently when solving problems, making conversions within or across systems
9. Solves problems on and off the coordinate plane
10. Demonstrates conceptual understanding of spatial reasoning and visualization
11. Identifies, extends, and generalizes a variety of patterns
12. Demonstrates conceptual understanding of algebraic expressions

Computer Integrated Mathematics COURSE PROCESS SKILLS

1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content.
2. Students will use mathematical reasoning and proof.
3. Students will communicate their understanding of mathematics.
4. Students will create and use representations to communicate mathematical ideas and to solve problems.
5. Students will recognize, explore, and develop mathematical connections.

Numbers and Operations – Stem 1

Introduction – Technical Drafting

Topics	Estimates; angles; fractions; parallel and perpendicular lines; similarity; congruence, conversions
Competencies	<ol style="list-style-type: none"> 1. Demonstrates understanding of real numbers 3. Makes estimates 4. Uses properties of angle relationships 5. Applies the concepts of congruency

	<p>6. Applies the concepts of similarity</p> <p>8. Uses the units of measure appropriately and consistently when solving problems, making conversions within or across systems</p> <p>9. Solves problems on and off the coordinate plane</p>
<p>Knowledge/Skills</p>	<p>Make realistic estimates of measurements</p> <p>Measure and identify angles and their properties</p> <p>Understand properties of fractions including adding and subtracting</p> <p>Understand the properties of parallel and perpendicular lines</p> <p>Understand the similarity properties of polygons</p> <p>Use the properties of congruence related to geometric figures</p> <p>Make conversions between fractions and decimals</p>
<p>Process Skills</p>	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning and proof. 3. Students will communicate their understanding of mathematics. 4. Students will create and use representations to communicate mathematical ideas and to solve problems. 5. Students will recognize, explore, and develop mathematical connections.

Geometry and Measurements –Stem 2

Tessellations and Transformations

Topics	Rotations, reflections, translations, patterns
Competencies	4. Uses properties of angle relationships 10. Demonstrates conceptual understanding of spatial reasoning and visualization 11. Identifies, extends, and generalizes a variety of patterns
Knowledge/Skills	Rotate geometric figures Reflect geometric figures Translate geometric figures Recognize and create patterns
Process Skills	1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 3. Students will communicate their understanding of mathematics 4. Students will create and use representations to communicate mathematical ideas and to solve problems. 5. Students will recognize, explore, and develop mathematical connections.

Geometry and Measurement - Stem 3

Bridge Building

Topics	Triangles; equality; conceptual design versus physical design; problems with variables
Competencies	1. Demonstrates understanding of real numbers 4. Uses properties of angle relationships

	<p>10. Demonstrates conceptual understanding of spatial reasoning and visualization</p> <p>11. Identifies, extends, and generalizes a variety of patterns</p> <p>12. Demonstrates conceptual understanding of algebraic expressions</p>
Knowledge/Skills	<p>Use the properties of triangles</p> <p>Use equality to balance and create a stable bridge</p> <p>Create a concept bridge on the computer</p> <p>Create a physical model bridge</p> <p>Solve problems with multiple variables and problems with different constants</p>
Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning and proof. 3. Students will communicate their understanding of mathematics. 4. Students will create and use representations to communicate mathematical ideas and to solve problems. 5. Students will recognize, explore, and develop mathematical connections.

Functions and Algebra - Stem 4

Graphic Design

Topics	Measurements and conversions, similarity, special relationships
Competencies	<p>1. Demonstrates understanding of real numbers</p> <p>9. Demonstrates conceptual understanding of algebraic expressions</p> <p>10. Demonstrates conceptual understanding of equality</p>
Knowledge/Skills	<p>Use different forms of measurements and convert between the measurements</p> <p>Use similarity in text and picture size</p> <p>Understand special relationships and how people are effected</p>
Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning and proof. 3. Students will communicate their understanding of mathematics. 4. Students will create and use representations to communicate mathematical ideas and to solve problems. 5. Students will recognize, explore, and develop mathematical connections.

Functions and Algebra - Stem 5

Animation

Topics	X, Y, and Z coordinates; graphing; 3-D design; geometric figures
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Competencies	<p>7. Solves problems involving perimeter, circumferences, or area</p> <p>9. Solves problems on and off the coordinate plane</p> <p>10. Demonstrates conceptual understanding of spatial reasoning and visualization</p>
Knowledge/Skills	<p>Use X, Y, and Z coordinates to create figures and animation</p> <p>Graph on multiple coordinate planes</p> <p>Create 3-D designs</p> <p>Use geomtric figures and properties to creae animation</p>
Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning and proof. 3. Students will communicate their understanding of mathematics. 4. Students will create and use representations to communicate mathematical ideas and to solve problems. 5. Students will recognize, explore, and develop mathematical connections.

Geometry and Measurement - Stem 6

Architecture Design

Topics	Angles; parallel and perpendicular lines; perimeter; area; spatial relationships
Competencies	<ol style="list-style-type: none"> 1. Demonstrates understanding of real numbers 4. Uses properties of angle relationships

	<p>7. Solves problems involving perimeter, circumferences, or area</p> <p>8. Uses the units of measure appropriately and consistently when solving problems, making conversions within or across systems</p> <p>9. Solves problems on and off the coordinate plane</p> <p>10. Demonstrates conceptual understanding of spatial reasoning and visualization</p>
Knowledge/Skills	<p>Use angles and their relationships in creating characteristics of a house</p> <p>Use parallel and perpendicular lines in design</p> <p>Find perimeters and areas</p> <p>Understand the spatial relationships of house design</p>
Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning and proof. 3. Students will communicate their understanding of mathematics. 4. Students will create and use representations to communicate mathematical ideas and to solve problems. 5. Students will recognize, explore, and develop mathematical connections.

Geometry and Measurement Stem 7

Civil Design

Topics	Angles; measurement and distance; graphing
Competencies	<ol style="list-style-type: none"> 1. Demonstrates understanding of real numbers 4. Uses properties of angle relationships 8. Uses the units of measure appropriately and consistently when solving problems, making conversions within or across systems 9. Solves problems on and off the coordinate plane 10. Demonstrates conceptual understanding of spatial reasoning and visualization
Knowledge/Skills	<p>Use the properties of complementary and supplementary angles</p> <p>Find the measurement and distance between different points in space</p> <p>Graph on a coordinate plane</p> <p>Create lines of varying elevations</p>
Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning and proof. 3. Students will communicate their understanding of mathematics. 4. Students will create and use representations to communicate mathematical ideas and to solve problems. 5. Students will recognize, explore, and develop mathematical connections.

Numbers and Operations - Stem 8

Topics	
Competencies	
Knowledge/Skills	
Process Skills	