Main Criteria: Forward

Secondary Criteria: Idaho Content Standards, Illinois Learning Standards, Indiana Academic Standards, Iowa Student Standards, Kansas Academic Standards, Kentucky Academic Standards, Louisiana Academic Standards, Maine Learning Results, Maryland College and Career-Ready Standards, Massachusetts Curriculum Frameworks, Mathematics, Michigan Academic Standards, Minnesota Academic Standards, Mississippi College & Career Readiness Standards, Missouri Learning Standards, Montana Content Standards

Subjects: Mathematics, Science, Technology Education

Grades: 5, 6, 7, 8, Key Stage 2, Key Stage 3

Forward

Solar Water Disinfection (SODIS)

Idaho Content Standards

Mathematics

Grade **5** - Adopted: **2022**

STANDARD / COURSE		Fifth Grade Standards for Mathematical Practice
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.1.	Make sense of problems and persevere in solving them.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.2.	Reason abstractly and quantitatively.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.3.	Construct viable arguments and critique the reasoning of others.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.4.	Model with mathematics.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.5.	Use appropriate tools strategically.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.7.	Look for and make use of structure.
STANDARD / COURSE	**5.MD.**	**Measurement and Data**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**5.MD.C.**	**Geometric measurement: Understand concepts of volume and relate volume to multiplication and to addition.**
GLE / BIG IDEA	5.MD.C.4.	Use concrete and/or visual models to measure the volume of rectangular prisms in cubic units by counting cubic cm, cubic in, cubic ft, and nonstandard units.
STANDARD / COURSE	**5.MD.**	**Measurement and Data**

CONTENT KNOWLEDGE AND SKILLS / GOAL	**5.MD.C.**	**Geometric measurement: Understand concepts of volume and relate volume to multiplication and to addition.**
GLE / BIG IDEA	**5.MD.C.5.**	**Relate volume to the operations of multiplication and addition and solve real-world and mathematical problems involving volume.**
OBJECTIVE	5.MD.C.5.a.	Find the volume of a right rectangular prism with whole-number edge lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base.
OBJECTIVE	5.MD.C.5.b.	Apply the formulas □□=□□×□□×□ and □□=□□×□ (where □□ stands for the area of the base) for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths, and in the context of solving real-world and mathematical problems.

Idaho Content Standards

Mathematics

Grade **6** - Adopted: **2022**

STANDARD / COURSE		**Sixth Grade Standards for Mathematical Practice**
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.1.	Make sense of problems and persevere in solving them.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.2.	Reason abstractly and quantitatively.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.3.	Construct viable arguments and critique the reasoning of others.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.4.	Model with mathematics.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.5.	Use appropriate tools strategically.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.7.	Look for and make use of structure.
STANDARD / COURSE	**6.G.**	**Geometry**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**6.G.A.**	**Solve real-world and mathematical problems involving area, surface area, and volume.**

GLE / BIG IDEA	6.G.A.2.	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas □=lwh and □=□□ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

Idaho Content Standards

Mathematics

Grade **7** - Adopted: **2022**

STANDARD / COURSE		**Seventh Grade Standards for Mathematical Practice**
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.1.	Make sense of problems and persevere in solving them.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.2.	Reason abstractly and quantitatively.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.3.	Construct viable arguments and critique the reasoning of others.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.4.	Model with mathematics.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.5.	Use appropriate tools strategically.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.7.	Look for and make use of structure.
STANDARD / COURSE	**7.G.**	**Geometry**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**7.G.B.**	**Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.**
GLE / BIG IDEA	7.G.B.6.	Generalize strategies for finding area, volume, and surface areas of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. Solve real-world and mathematical problems in each of these areas.

Idaho Content Standards

Mathematics

Grade **8** - Adopted: **2022**

STANDARD / COURSE		**Eighth Grade Standards for Mathematical Practice**

CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.1.	Make sense of problems and persevere in solving them.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.2.	Reason abstractly and quantitatively.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.3.	Construct viable arguments and critique the reasoning of others.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.4.	Model with mathematics.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.5.	Use appropriate tools strategically.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.7.	Look for and make use of structure.
STANDARD / COURSE	**8.G.**	**Geometry**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**8.G.C.**	**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.**
GLE / BIG IDEA	8.G.C.9.	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Idaho Content Standards

Science

Grade **6** - Adopted: **2022**

STANDARD / COURSE	**MS-PS.**	**Physical Science**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**MS-PS-4.**	**Waves**
GLE / BIG IDEA	MS-PS-4.3.	Present qualitative scientific and technical information to support the claim that digitized signals (0s and 1s) can be used to encode and transmit information.
STANDARD / COURSE	**MS-ESS.**	**Earth and Space Science**

CONTENT KNOWLEDGE AND SKILLS / GOAL	**MS-ESS-3.**	**Earth and Human Activity**
GLE / BIG IDEA	MS-ESS-3.4.	Construct an argument based on evidence for how changes in human population and per-capita consumption of natural resources positively and negatively affect Earth's systems.

Idaho Content Standards

Science

Grade **7** - Adopted: **2022**

STANDARD / COURSE	**MS-PS.**	**Physical Science**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**MS-PS-4.**	**Waves**
GLE / BIG IDEA	MS-PS-4.3.	Present qualitative scientific and technical information to support the claim that digitized signals (0s and 1s) can be used to encode and transmit information.

STANDARD / COURSE	**MS-ESS.**	**Earth and Space Science**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**MS-ESS-3.**	**Earth and Human Activity**
GLE / BIG IDEA	MS-ESS-3.4.	Construct an argument based on evidence for how changes in human population and per-capita consumption of natural resources positively and negatively affect Earth's systems.

Idaho Content Standards

Science

Grade **8** - Adopted: **2022**

STANDARD / COURSE	**MS-PS.**	**Physical Science**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**MS-PS-4.**	**Waves**
GLE / BIG IDEA	MS-PS-4.3.	Present qualitative scientific and technical information to support the claim that digitized signals (0s and 1s) can be used to encode and transmit information.

STANDARD / COURSE	**MS-ESS.**	**Earth and Space Science**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**MS-ESS-3.**	**Earth and Human Activity**
GLE / BIG IDEA	MS-ESS-3.4.	Construct an argument based on evidence for how changes in human population and per-capita consumption of natural resources positively and negatively affect Earth's systems.

Idaho Content Standards

Technology Education

Grade **5** - Adopted: **2017**

STANDARD / COURSE	ID.ICT.3-5.3.	STANDARD 3: KNOWLEDGE CONSTRUCTOR
CONTENT KNOWLEDGE AND SKILLS / GOAL		Goal 3: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
GLE / BIG IDEA	ICT.3-5.3.d.	Students explore real-world problems and issues and collaborate with others to find answers or solutions.

STANDARD / COURSE	ID.ICT.3-5.5.	STANDARD 5: COMPUTATIONAL THINKER
CONTENT KNOWLEDGE AND SKILLS / GOAL		Goal 5: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.
GLE / BIG IDEA	ICT.3-5.5.a.	Students explore or solve problems by selecting technology for data analysis, modeling and algorithmic thinking, with guidance from an educator.
GLE / BIG IDEA	ICT.3-5.5.c.	Students break down problems into smaller parts, identify key information, and propose solutions.
GLE / BIG IDEA	ICT.3-5.5.d.	Students understand and explore basic concepts related to automation, patterns and algorithmic thinking.

STANDARD / COURSE	ID.CS.3-5.	COMPUTER SCIENCE
CONTENT KNOWLEDGE AND SKILLS / GOAL	3-5.IC.	Impacts of Computing (IC)
GLE / BIG IDEA		Fostering an Inclusive Computing Culture
OBJECTIVE	3-5.IC.02.	Explore the connections between computer science and other fields. (Grades 3-5)

STANDARD / COURSE	ID.CS.3-5.	COMPUTER SCIENCE
CONTENT KNOWLEDGE AND SKILLS / GOAL	3-5.AP.	Algorithms and Programming (AP)
GLE / BIG IDEA		Creating Computational Artifacts
OBJECTIVE	3-5.AP.02.	Construct and test problem solutions using a block-based visual programming language, both independently and collaboratively (e.g. pair programming). (Grades K-5)

STANDARD / COURSE	ID.CS.3-5.	COMPUTER SCIENCE
CONTENT KNOWLEDGE AND SKILLS / GOAL	3-5.AP.	Algorithms and Programming (AP)
GLE / BIG IDEA		Testing and Refining Computational Artifacts

OBJECTIVE	3-5.AP.05.	Understand, explain and debug the sequencing in an algorithm. (Grades 3-5)

STANDARD / COURSE	**ID.CS.3-5.**	**COMPUTER SCIENCE**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**3-5.AP.**	**Algorithms and Programming (AP)**
GLE / BIG IDEA		**Creating Computational Artifacts**

OBJECTIVE	3-5.AP.06.	Construct and test problem solutions using a block-based visual programming language, both independently and collaboratively (e.g. pair programming). (Grades K-5)

STANDARD / COURSE	**ID.CS.3-5.**	**COMPUTER SCIENCE**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**3-5.AP.**	**Algorithms and Programming (AP)**
GLE / BIG IDEA		**Developing and Using Abstractions**

OBJECTIVE	3-5.AP.07.	Construct an algorithm to accomplish a task, both independently and collaboratively. (Grades K-5)

Idaho Content Standards

Technology Education

Grade **6** - Adopted: **2017**

STANDARD / COURSE	**ID.ICT.6-8.3.**	**STANDARD 3: KNOWLEDGE CONSTRUCTOR**
CONTENT KNOWLEDGE AND SKILLS / GOAL		**Goal 3: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.**

GLE / BIG IDEA	ICT.6-8.3.d.	Students explore real-world issues and problems and actively pursue an understanding of them and solutions for them.

STANDARD / COURSE	**ID.ICT.6-8.4.**	**STANDARD 4: INNOVATIVE DESIGNER**
CONTENT KNOWLEDGE AND SKILLS / GOAL		**Goal 4: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.**

GLE / BIG IDEA	ICT.6-8.4.b.	Students select and use digital tools to support a design process and expand their understanding to identify constraints and trade-offs and to weigh risks.

GLE / BIG IDEA	ICT.6-8.4.d.	Students demonstrate an ability to persevere and handle greater ambiguity as they work to solve open-ended problems.

STANDARD / COURSE	**ID.ICT.6-8.5.**	**STANDARD 5: COMPUTATIONAL THINKER**

CONTENT KNOWLEDGE AND SKILLS / GOAL		**Goal 5: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.**
GLE / BIG IDEA	ICT.6-8.5.a.	Students practice defining problems to solve by computing for data analysis, modeling or algorithmic thinking.
GLE / BIG IDEA	ICT.6-8.5.b.	Students find or organize data and use technology to analyze and represent it to solve problems and make decisions and trade-offs and to weigh risks.
GLE / BIG IDEA	ICT.6-8.5.c.	Students break problems into component parts, identify key pieces and use that information to problem solve.
GLE / BIG IDEA	ICT.6-8.5.d.	Students demonstrate an understanding of how automation works and use algorithmic thinking to design and automate solutions.
STANDARD / COURSE	**ID.CS.6-8.**	**COMPUTER SCIENCE**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**6-8.AP.**	**Algorithms and Programming (AP)**
GLE / BIG IDEA		**Communicating About Computing**
OBJECTIVE	6-8.AP.02.	Compare different algorithms that may be used to solve the same problem by time and space efficiency. (Grades 6-8)

Idaho Content Standards

Technology Education

Grade **7** - Adopted: **2017**

STANDARD / COURSE	**ID.ICT.6-8.3.**	**STANDARD 3: KNOWLEDGE CONSTRUCTOR**
CONTENT KNOWLEDGE AND SKILLS / GOAL		**Goal 3: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.**
GLE / BIG IDEA	ICT.6-8.3.d.	Students explore real-world issues and problems and actively pursue an understanding of them and solutions for them.
STANDARD / COURSE	**ID.ICT.6-8.4.**	**STANDARD 4: INNOVATIVE DESIGNER**
CONTENT KNOWLEDGE AND SKILLS / GOAL		**Goal 4: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.**
GLE / BIG IDEA	ICT.6-8.4.b.	Students select and use digital tools to support a design process and expand their understanding to identify constraints and trade-offs and to weigh risks.
STANDARD / COURSE	**ID.ICT.6-8.5.**	**STANDARD 5: COMPUTATIONAL THINKER**

CONTENT KNOWLEDGE AND SKILLS / GOAL		**Goal 5: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.**
GLE / BIG IDEA	ICT.6-8.5.a.	Students practice defining problems to solve by computing for data analysis, modeling or algorithmic thinking.
GLE / BIG IDEA	ICT.6-8.5.b.	Students find or organize data and use technology to analyze and represent it to solve problems and make decisions and trade-offs and to weigh risks.
GLE / BIG IDEA	ICT.6-8.5.c.	Students break problems into component parts, identify key pieces and use that information to problem solve.
GLE / BIG IDEA	ICT.6-8.5.d.	Students demonstrate an understanding of how automation works and use algorithmic thinking to design and automate solutions.

STANDARD / COURSE	**ID.CS.6-8.**	**COMPUTER SCIENCE**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**6-8.AP.**	**Algorithms and Programming (AP)**
GLE / BIG IDEA		**Communicating About Computing**
OBJECTIVE	6-8.AP.02.	Compare different algorithms that may be used to solve the same problem by time and space efficiency. (Grades 6-8)

Idaho Content Standards

Technology Education

Grade **8** - Adopted: **2017**

STANDARD / COURSE	**ID.ICT.6-8.3.**	**STANDARD 3: KNOWLEDGE CONSTRUCTOR**
CONTENT KNOWLEDGE AND SKILLS / GOAL		**Goal 3: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.**
GLE / BIG IDEA	ICT.6-8.3.d.	Students explore real-world issues and problems and actively pursue an understanding of them and solutions for them.

STANDARD / COURSE	**ID.ICT.6-8.4.**	**STANDARD 4: INNOVATIVE DESIGNER**
CONTENT KNOWLEDGE AND SKILLS / GOAL		**Goal 4: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.**
GLE / BIG IDEA	ICT.6-8.4.b.	Students select and use digital tools to support a design process and expand their understanding to identify constraints and trade-offs and to weigh risks.

STANDARD / COURSE	**ID.ICT.6-8.5.**	**STANDARD 5: COMPUTATIONAL THINKER**

CONTENT KNOWLEDGE AND SKILLS / GOAL		**Goal 5: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.**
GLE / BIG IDEA	ICT.6-8.5.a.	Students practice defining problems to solve by computing for data analysis, modeling or algorithmic thinking.
GLE / BIG IDEA	ICT.6-8.5.b.	Students find or organize data and use technology to analyze and represent it to solve problems and make decisions and trade-offs and to weigh risks.
GLE / BIG IDEA	ICT.6-8.5.c.	Students break problems into component parts, identify key pieces and use that information to problem solve.
GLE / BIG IDEA	ICT.6-8.5.d.	Students demonstrate an understanding of how automation works and use algorithmic thinking to design and automate solutions.
STANDARD / COURSE	**ID.CS.6-8.**	**COMPUTER SCIENCE**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**6-8.AP.**	**Algorithms and Programming (AP)**
GLE / BIG IDEA		**Communicating About Computing**
OBJECTIVE	6-8.AP.02.	Compare different algorithms that may be used to solve the same problem by time and space efficiency. (Grades 6-8)

Illinois Learning Standards

Mathematics

Grade **5** - Adopted: **2010**

STATE GOAL / DISCIPLINARY CONCEPT	**IL.K-12.MP.**	**Mathematical Practices**
LEARNING STANDARD / DISCIPLINE	K-12.MP.1.	Make sense of problems and persevere in solving them.
LEARNING STANDARD / DISCIPLINE	K-12.MP.2.	Reason abstractly and quantitatively.
LEARNING STANDARD / DISCIPLINE	K-12.MP.3.	Construct viable arguments and critique the reasoning of others.
LEARNING STANDARD / DISCIPLINE	K-12.MP.4.	Model with mathematics.
LEARNING STANDARD / DISCIPLINE	K-12.MP.5.	Use appropriate tools strategically.

LEARNING STANDARD / DISCIPLINE	K-12.MP.7.	Look for and make use of structure.

STATE GOAL / DISCIPLINARY CONCEPT	**IL.5.MD.**	**Measurement and Data**
LEARNING STANDARD / DISCIPLINE		**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
DESCRIPTOR / CONTENT DISCIPLINE	CC.5.MD.4.	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

STATE GOAL / DISCIPLINARY CONCEPT	**IL.5.MD.**	**Measurement and Data**
LEARNING STANDARD / DISCIPLINE		**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
DESCRIPTOR / CONTENT DISCIPLINE	**CC.5.MD.5.**	**Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.**
STANDARD	CC.5.MD.5.a.	Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
STANDARD	CC.5.MD.5.b.	Apply the formulas V = l x w x h and V = b x h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.

Illinois Learning Standards

Mathematics

Grade **6** - Adopted: **2010**

STATE GOAL / DISCIPLINARY CONCEPT	**IL.K-12.MP.**	**Mathematical Practices**
LEARNING STANDARD / DISCIPLINE	K-12.MP.1.	Make sense of problems and persevere in solving them.
LEARNING STANDARD / DISCIPLINE	K-12.MP.2.	Reason abstractly and quantitatively.
LEARNING STANDARD / DISCIPLINE	K-12.MP.3.	Construct viable arguments and critique the reasoning of others.
LEARNING STANDARD / DISCIPLINE	K-12.MP.4.	Model with mathematics.

LEARNING STANDARD / DISCIPLINE	K-12.MP.5.	Use appropriate tools strategically.
LEARNING STANDARD / DISCIPLINE	K-12.MP.7.	Look for and make use of structure.
STATE GOAL / DISCIPLINARY CONCEPT	**IL.6.G.**	**Geometry**
LEARNING STANDARD / DISCIPLINE		**Solve real-world and mathematical problems involving area, surface area, and volume.**
DESCRIPTOR / CONTENT DISCIPLINE	CC.6.G.2.	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

Illinois Learning Standards

Mathematics

Grade **7** - Adopted: **2010**

STATE GOAL / DISCIPLINARY CONCEPT	**IL.K-12.MP.**	**Mathematical Practices**
LEARNING STANDARD / DISCIPLINE	K-12.MP.1.	Make sense of problems and persevere in solving them.
LEARNING STANDARD / DISCIPLINE	K-12.MP.2.	Reason abstractly and quantitatively.
LEARNING STANDARD / DISCIPLINE	K-12.MP.3.	Construct viable arguments and critique the reasoning of others.
LEARNING STANDARD / DISCIPLINE	K-12.MP.4.	Model with mathematics.
LEARNING STANDARD / DISCIPLINE	K-12.MP.5.	Use appropriate tools strategically.
LEARNING STANDARD / DISCIPLINE	K-12.MP.7.	Look for and make use of structure.

Illinois Learning Standards

Mathematics

Grade **8** - Adopted: **2010**

STATE GOAL / DISCIPLINARY CONCEPT	**IL.K-12.MP.**	**Mathematical Practices**

LEARNING STANDARD / DISCIPLINE	K-12.MP.1.	Make sense of problems and persevere in solving them.
LEARNING STANDARD / DISCIPLINE	K-12.MP.2.	Reason abstractly and quantitatively.
LEARNING STANDARD / DISCIPLINE	K-12.MP.3.	Construct viable arguments and critique the reasoning of others.
LEARNING STANDARD / DISCIPLINE	K-12.MP.4.	Model with mathematics.
LEARNING STANDARD / DISCIPLINE	K-12.MP.5.	Use appropriate tools strategically.
LEARNING STANDARD / DISCIPLINE	K-12.MP.7.	Look for and make use of structure.
STATE GOAL / DISCIPLINARY CONCEPT	**IL.8.G.**	**Geometry**
LEARNING STANDARD / DISCIPLINE		**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.**
DESCRIPTOR / CONTENT DISCIPLINE	CC.8.G.9.	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Illinois Learning Standards

Science

Grade **5** - Adopted: **2014**

STATE GOAL / DISCIPLINARY CONCEPT	**IL.3-5-ETS.**	**ENGINEERING DESIGN**
LEARNING STANDARD / DISCIPLINE	**3-5-ETS1.**	**Engineering Design**
DESCRIPTOR / CONTENT DISCIPLINE		**Students who demonstrate understanding can:**
STANDARD	3-5-ETS1-1.	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
STANDARD	3-5-ETS1-2.	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
STANDARD	3-5-ETS1-3.	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Illinois Learning Standards

Science

Grade **6** - Adopted: **2014**

STATE GOAL / DISCIPLINARY CONCEPT	**IL.MS-ESS.**	**EARTH AND SPACE SCIENCE**
LEARNING STANDARD / DISCIPLINE	**MS-ESS3.**	**Earth and Human Activity**
DESCRIPTOR / CONTENT DISCIPLINE		**Students who demonstrate understanding can:**
STANDARD	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

STATE GOAL / DISCIPLINARY CONCEPT	**IL.MS-ETS.**	**ENGINEERING DESIGN**
LEARNING STANDARD / DISCIPLINE	**MS-ETS1.**	**Engineering Design**
DESCRIPTOR / CONTENT DISCIPLINE		**Students who demonstrate understanding can:**
STANDARD	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
STANDARD	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
STANDARD	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **6** - Adopted: **2010**

STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
LEARNING STANDARD / DISCIPLINE		**Key Ideas and Details**
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**

LEARNING STANDARD / DISCIPLINE		**Craft and Structure**
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
LEARNING STANDARD / DISCIPLINE		**Integration of Knowledge and Ideas**
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
LEARNING STANDARD / DISCIPLINE		**Range of Reading and Level of Text Complexity**
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.
STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
LEARNING STANDARD / DISCIPLINE		**Text Types and Purposes**
DESCRIPTOR / CONTENT DISCIPLINE	**CC.6-8.WHST.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
STANDARD	CC.6-8.WHST.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic.
STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
LEARNING STANDARD / DISCIPLINE		**Production and Distribution of Writing**
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.WHST.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.WHST.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Illinois Learning Standards

Science

Grade **7** - Adopted: **2014**

STATE GOAL / DISCIPLINARY CONCEPT	**IL.MS-ESS.**	**EARTH AND SPACE SCIENCE**
LEARNING STANDARD / DISCIPLINE	**MS-ESS3.**	**Earth and Human Activity**
DESCRIPTOR / CONTENT DISCIPLINE		**Students who demonstrate understanding can:**
STANDARD	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

STATE GOAL / DISCIPLINARY CONCEPT	**IL.MS-ETS.**	**ENGINEERING DESIGN**
LEARNING STANDARD / DISCIPLINE	**MS-ETS1.**	**Engineering Design**
DESCRIPTOR / CONTENT DISCIPLINE		**Students who demonstrate understanding can:**
STANDARD	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
STANDARD	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
STANDARD	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **7** - Adopted: **2010**

STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
LEARNING STANDARD / DISCIPLINE		**Key Ideas and Details**
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
LEARNING STANDARD / DISCIPLINE		**Craft and Structure**
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
LEARNING STANDARD / DISCIPLINE		**Integration of Knowledge and Ideas**
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
LEARNING STANDARD / DISCIPLINE		**Range of Reading and Level of Text Complexity**
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
LEARNING STANDARD / DISCIPLINE		**Text Types and Purposes**
DESCRIPTOR / CONTENT DISCIPLINE	**CC.6-8.WHST.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
STANDARD	CC.6-8.WHST.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic.

STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
LEARNING STANDARD / DISCIPLINE		**Production and Distribution of Writing**

DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.WHST.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.WHST.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Illinois Learning Standards

Science

Grade **8** - Adopted: **2014**

STATE GOAL / DISCIPLINARY CONCEPT	**IL.MS-ESS.**	**EARTH AND SPACE SCIENCE**
LEARNING STANDARD / DISCIPLINE	**MS-ESS3.**	**Earth and Human Activity**
DESCRIPTOR / CONTENT DISCIPLINE		**Students who demonstrate understanding can:**
STANDARD	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

STATE GOAL / DISCIPLINARY CONCEPT	**IL.MS-ETS.**	**ENGINEERING DESIGN**
LEARNING STANDARD / DISCIPLINE	**MS-ETS1.**	**Engineering Design**
DESCRIPTOR / CONTENT DISCIPLINE		**Students who demonstrate understanding can:**
STANDARD	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
STANDARD	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
STANDARD	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **8** - Adopted: **2010**

STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
LEARNING STANDARD / DISCIPLINE		**Key Ideas and Details**
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
LEARNING STANDARD / DISCIPLINE		**Craft and Structure**
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
LEARNING STANDARD / DISCIPLINE		**Integration of Knowledge and Ideas**
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.RST.**	**Reading Standards for Literacy in Science and Technical Subjects**
LEARNING STANDARD / DISCIPLINE		**Range of Reading and Level of Text Complexity**
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.RST.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.
STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**
LEARNING STANDARD / DISCIPLINE		**Text Types and Purposes**
DESCRIPTOR / CONTENT DISCIPLINE	**CC.6-8.WHST.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
STANDARD	CC.6-8.WHST.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic.
STATE GOAL / DISCIPLINARY CONCEPT	**IL.6-8.WHST.**	**Writing Standards for Literacy in Science and Technical Subjects**

LEARNING STANDARD / DISCIPLINE		**Production and Distribution of Writing**
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.WHST.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
DESCRIPTOR / CONTENT DISCIPLINE	CC.6-8.WHST.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Illinois Learning Standards

Technology Education

Grade **5** - Adopted: **2022**

STATE GOAL / DISCIPLINARY CONCEPT		**Illinois Computer Science Standards**
LEARNING STANDARD / DISCIPLINE		**Computer Science Practices**
DESCRIPTOR / CONTENT DISCIPLINE	3	Recognizing and defining computational problems.
DESCRIPTOR / CONTENT DISCIPLINE	5	Creating computational artifacts.
DESCRIPTOR / CONTENT DISCIPLINE	6	Testing and refining computational artifacts.

STATE GOAL / DISCIPLINARY CONCEPT		**Illinois Computer Science Standards**
LEARNING STANDARD / DISCIPLINE		**Computer Science Standards**
DESCRIPTOR / CONTENT DISCIPLINE	**3-5.CS.**	**Computing Systems**
STANDARD		**Troubleshooting**
EXPECTATION	3-5.CS.03.	Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies.

STATE GOAL / DISCIPLINARY CONCEPT		**Illinois Computer Science Standards**
LEARNING STANDARD / DISCIPLINE		**Computer Science Standards**
DESCRIPTOR / CONTENT DISCIPLINE	**3-5.DA.**	**Data and Analysis**
STANDARD		**Interference and Models**

EXPECTATION	3-5.DA.07.	Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.

STATE GOAL / DISCIPLINARY CONCEPT		**Illinois Computer Science Standards**
LEARNING STANDARD / DISCIPLINE		**Computer Science Standards**
DESCRIPTOR / CONTENT DISCIPLINE	**3-5.AP.**	**Algorithms and Programming**
STANDARD		**Algorithms**
EXPECTATION	3-5.AP.08.	Compare and refine multiple algorithms for the same task and determine which is the most appropriate.

STATE GOAL / DISCIPLINARY CONCEPT		**Illinois Computer Science Standards**
LEARNING STANDARD / DISCIPLINE		**Computer Science Standards**
DESCRIPTOR / CONTENT DISCIPLINE	**3-5.AP.**	**Algorithms and Programming**
STANDARD		**Modularity**
EXPECTATION	3-5.AP.11.	Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.

STATE GOAL / DISCIPLINARY CONCEPT		**Illinois Computer Science Standards**
LEARNING STANDARD / DISCIPLINE		**Computer Science Standards**
DESCRIPTOR / CONTENT DISCIPLINE	**3-5.ET.**	**Emerging and Future Technologies**
STANDARD	3-5.ET.E.	Create new or original work by applying emerging technologies.

Grade **5** - Adopted: **2016**

STATE GOAL / DISCIPLINARY CONCEPT		**ISTE Standards for Students**
LEARNING STANDARD / DISCIPLINE	**IL.ISTE-S.3.**	**Knowledge Constructors: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.**
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.3.d.	Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

STATE GOAL / DISCIPLINARY CONCEPT		**ISTE Standards for Students**

LEARNING STANDARD / DISCIPLINE	**IL.ISTE-S.4.**	**Innovative Designers: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.**
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.4.a.	Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.4.b.	Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
STATE GOAL / DISCIPLINARY CONCEPT		**ISTE Standards for Students**
LEARNING STANDARD / DISCIPLINE	**IL.ISTE-S.5.**	**Computational Thinkers: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.**
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.5.a.	Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions.
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.5.b.	Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.5.d.	Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Illinois Learning Standards

Technology Education

Grade **6** - Adopted: **2022**

STATE GOAL / DISCIPLINARY CONCEPT		**Illinois Computer Science Standards**
LEARNING STANDARD / DISCIPLINE		**Computer Science Practices**
DESCRIPTOR / CONTENT DISCIPLINE	3	Recognizing and defining computational problems.
DESCRIPTOR / CONTENT DISCIPLINE	5	Creating computational artifacts.
DESCRIPTOR / CONTENT DISCIPLINE	6	Testing and refining computational artifacts.
STATE GOAL / DISCIPLINARY CONCEPT		**Illinois Computer Science Standards**

LEARNING STANDARD / DISCIPLINE		**Computer Science Standards**
DESCRIPTOR / CONTENT DISCIPLINE	**6-8.CS.**	**Computing Systems**
STANDARD		**Troubleshooting**
EXPECTATION	6-8.CS.03.	Systematically identify and fix problems with computing devices and their components.

STATE GOAL / DISCIPLINARY CONCEPT		**Illinois Computer Science Standards**
LEARNING STANDARD / DISCIPLINE		**Computer Science Standards**
DESCRIPTOR / CONTENT DISCIPLINE	**6-8.AP.**	**Algorithms and Programming**
STANDARD		**Algorithms**
EXPECTATION	6-8.AP.11.	Use flowcharts or pseudocode to address complex problems as algorithms.

STATE GOAL / DISCIPLINARY CONCEPT		**Illinois Computer Science Standards**
LEARNING STANDARD / DISCIPLINE		**Computer Science Standards**
DESCRIPTOR / CONTENT DISCIPLINE	**6-8.AP.**	**Algorithms and Programming**
STANDARD		**Modularity**
EXPECTATION	6-8.AP.14.	Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.

STATE GOAL / DISCIPLINARY CONCEPT		**Illinois Computer Science Standards**
LEARNING STANDARD / DISCIPLINE		**Computer Science Standards**
DESCRIPTOR / CONTENT DISCIPLINE	**6-8.IC.**	**Impacts of Computing**
STANDARD		**Social Interactions**
EXPECTATION	6-8.IC.23.	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact.

STATE GOAL / DISCIPLINARY CONCEPT		**Illinois Computer Science Standards**

LEARNING STANDARD / DISCIPLINE		**Computer Science Standards**
DESCRIPTOR / CONTENT DISCIPLINE	**6-8.ET.**	**Emerging and Future Technologies**
STANDARD	6-8.ET.E.	Create new or original work by applying emerging technologies.

Grade **6** - Adopted: **2016**

STATE GOAL / DISCIPLINARY CONCEPT		**ISTE Standards for Students**
LEARNING STANDARD / DISCIPLINE	**IL.ISTE-S.3.**	**Knowledge Constructors: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.**
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.3.d.	Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

STATE GOAL / DISCIPLINARY CONCEPT		**ISTE Standards for Students**
LEARNING STANDARD / DISCIPLINE	**IL.ISTE-S.4.**	**Innovative Designers: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.**
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.4.a.	Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.4.b.	Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

STATE GOAL / DISCIPLINARY CONCEPT		**ISTE Standards for Students**
LEARNING STANDARD / DISCIPLINE	**IL.ISTE-S.5.**	**Computational Thinkers: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.**
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.5.a.	Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions.
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.5.b.	Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.5.d.	Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Illinois Learning Standards

Technology Education

Grade **7** - Adopted: **2022**

STATE GOAL / DISCIPLINARY CONCEPT		Illinois Computer Science Standards
LEARNING STANDARD / DISCIPLINE		**Computer Science Practices**
DESCRIPTOR / CONTENT DISCIPLINE	3	Recognizing and defining computational problems.
DESCRIPTOR / CONTENT DISCIPLINE	5	Creating computational artifacts.
DESCRIPTOR / CONTENT DISCIPLINE	6	Testing and refining computational artifacts.

STATE GOAL / DISCIPLINARY CONCEPT		Illinois Computer Science Standards
LEARNING STANDARD / DISCIPLINE		**Computer Science Standards**
DESCRIPTOR / CONTENT DISCIPLINE	**6-8.CS.**	**Computing Systems**
STANDARD		**Troubleshooting**
EXPECTATION	6-8.CS.03.	Systematically identify and fix problems with computing devices and their components.

STATE GOAL / DISCIPLINARY CONCEPT		Illinois Computer Science Standards
LEARNING STANDARD / DISCIPLINE		**Computer Science Standards**
DESCRIPTOR / CONTENT DISCIPLINE	**6-8.AP.**	**Algorithms and Programming**
STANDARD		**Algorithms**
EXPECTATION	6-8.AP.11.	Use flowcharts or pseudocode to address complex problems as algorithms.

STATE GOAL / DISCIPLINARY CONCEPT		Illinois Computer Science Standards
LEARNING STANDARD / DISCIPLINE		**Computer Science Standards**
DESCRIPTOR / CONTENT DISCIPLINE	**6-8.AP.**	**Algorithms and Programming**
STANDARD		**Modularity**

EXPECTATION	6-8.AP.14.	Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.

STATE GOAL / DISCIPLINARY CONCEPT		**Illinois Computer Science Standards**
LEARNING STANDARD / DISCIPLINE		**Computer Science Standards**
DESCRIPTOR / CONTENT DISCIPLINE	**6-8.IC.**	**Impacts of Computing**
STANDARD		**Social Interactions**
EXPECTATION	6-8.IC.23.	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact.

STATE GOAL / DISCIPLINARY CONCEPT		**Illinois Computer Science Standards**
LEARNING STANDARD / DISCIPLINE		**Computer Science Standards**
DESCRIPTOR / CONTENT DISCIPLINE	**6-8.ET.**	**Emerging and Future Technologies**
STANDARD	6-8.ET.E.	Create new or original work by applying emerging technologies.

Grade **7** - Adopted: **2016**

STATE GOAL / DISCIPLINARY CONCEPT		**ISTE Standards for Students**
LEARNING STANDARD / DISCIPLINE	**IL.ISTE-S.3.**	**Knowledge Constructors: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.**
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.3.d.	Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

STATE GOAL / DISCIPLINARY CONCEPT		**ISTE Standards for Students**
LEARNING STANDARD / DISCIPLINE	**IL.ISTE-S.4.**	**Innovative Designers: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.**
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.4.a.	Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.4.b.	Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

STATE GOAL / DISCIPLINARY CONCEPT		ISTE Standards for Students
LEARNING STANDARD / DISCIPLINE	**IL.ISTE-S.5.**	**Computational Thinkers: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.**
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.5.a.	Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions.
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.5.b.	Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.5.d.	Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Illinois Learning Standards

Technology Education

Grade **8** - Adopted: **2022**

STATE GOAL / DISCIPLINARY CONCEPT		Illinois Computer Science Standards
LEARNING STANDARD / DISCIPLINE		**Computer Science Practices**
DESCRIPTOR / CONTENT DISCIPLINE	3	Recognizing and defining computational problems.
DESCRIPTOR / CONTENT DISCIPLINE	5	Creating computational artifacts.
DESCRIPTOR / CONTENT DISCIPLINE	6	Testing and refining computational artifacts.

STATE GOAL / DISCIPLINARY CONCEPT		Illinois Computer Science Standards
LEARNING STANDARD / DISCIPLINE		**Computer Science Standards**
DESCRIPTOR / CONTENT DISCIPLINE	**6-8.CS.**	**Computing Systems**
STANDARD		**Troubleshooting**
EXPECTATION	6-8.CS.03.	Systematically identify and fix problems with computing devices and their components.

STATE GOAL / DISCIPLINARY CONCEPT		Illinois Computer Science Standards
LEARNING STANDARD / DISCIPLINE		Computer Science Standards
DESCRIPTOR / CONTENT DISCIPLINE	6-8.AP.	Algorithms and Programming
STANDARD		Algorithms
EXPECTATION	6-8.AP.11.	Use flowcharts or pseudocode to address complex problems as algorithms.

STATE GOAL / DISCIPLINARY CONCEPT		Illinois Computer Science Standards
LEARNING STANDARD / DISCIPLINE		Computer Science Standards
DESCRIPTOR / CONTENT DISCIPLINE	6-8.AP.	Algorithms and Programming
STANDARD		Modularity
EXPECTATION	6-8.AP.14.	Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.

STATE GOAL / DISCIPLINARY CONCEPT		Illinois Computer Science Standards
LEARNING STANDARD / DISCIPLINE		Computer Science Standards
DESCRIPTOR / CONTENT DISCIPLINE	6-8.IC.	Impacts of Computing
STANDARD		Social Interactions
EXPECTATION	6-8.IC.23.	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact.

STATE GOAL / DISCIPLINARY CONCEPT		Illinois Computer Science Standards
LEARNING STANDARD / DISCIPLINE		Computer Science Standards
DESCRIPTOR / CONTENT DISCIPLINE	6-8.ET.	Emerging and Future Technologies
STANDARD	6-8.ET.E.	Create new or original work by applying emerging technologies.

STATE GOAL / DISCIPLINARY CONCEPT		ISTE Standards for Students
LEARNING STANDARD / DISCIPLINE	**IL.ISTE-S.3.**	**Knowledge Constructors: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.**
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.3.d.	Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

STATE GOAL / DISCIPLINARY CONCEPT		ISTE Standards for Students
LEARNING STANDARD / DISCIPLINE	**IL.ISTE-S.4.**	**Innovative Designers: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.**
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.4.a.	Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.4.b.	Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

STATE GOAL / DISCIPLINARY CONCEPT		ISTE Standards for Students
LEARNING STANDARD / DISCIPLINE	**IL.ISTE-S.5.**	**Computational Thinkers: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.**
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.5.a.	Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions.
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.5.b.	Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
DESCRIPTOR / CONTENT DISCIPLINE	ISTE-S.5.d.	Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Indiana Academic Standards

Mathematics

Grade **5** - Adopted: **2023**

STANDARD / STRAND		Mathematics Process Standards
PROFICIENCY STATEMENT / SUBSTRAND	PS.1:	Make sense of problems and persevere in solving them.

PROFICIENCY STATEMENT / SUBSTRAND	PS.2:	Reason abstractly and quantitatively.
PROFICIENCY STATEMENT / SUBSTRAND	PS.3:	Construct viable arguments and critique the reasoning of others.
PROFICIENCY STATEMENT / SUBSTRAND	PS.4:	Model with mathematics.
PROFICIENCY STATEMENT / SUBSTRAND	PS.5:	Use appropriate tools strategically.
PROFICIENCY STATEMENT / SUBSTRAND	PS.7:	Look for and make use of structure.
STANDARD / STRAND		**Grade 5 Mathematics**
PROFICIENCY STATEMENT / SUBSTRAND		**Measurement – Learning Outcome: Students investigate the volume of rectangular prisms and solve real-world problems through the development and application of area formulas for rectangles, triangles, parallelograms, and trapezoids. Students investigate and convert measurements within the Customary and metric measurement systems.**
INDICATOR / STANDARD	5.M.4.	Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths or multiplying the height by the area of the base. (E)
INDICATOR / STANDARD	5.M.5.	Apply the formulas V = l × w × h and V = B × h for right rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths to solve real-world problems and other mathematical problems. (E)

Indiana Academic Standards

Mathematics

Grade **6** - Adopted: **2023**

STANDARD / STRAND		**Mathematics Process Standards**
PROFICIENCY STATEMENT / SUBSTRAND	PS.1:	Make sense of problems and persevere in solving them.
PROFICIENCY STATEMENT / SUBSTRAND	PS.2:	Reason abstractly and quantitatively.
PROFICIENCY STATEMENT / SUBSTRAND	PS.3:	Construct viable arguments and critique the reasoning of others.
PROFICIENCY STATEMENT / SUBSTRAND	PS.4:	Model with mathematics.

PROFICIENCY STATEMENT / SUBSTRAND	PS.5:	Use appropriate tools strategically.
PROFICIENCY STATEMENT / SUBSTRAND	PS.7:	Look for and make use of structure.
STANDARD / STRAND		**Grade 6 Mathematics**
PROFICIENCY STATEMENT / SUBSTRAND		**Geometry and Measurement – Learning Outcome: Students find areas of complex shapes and find volumes of rectangular prisms.**
INDICATOR / STANDARD	6.GM.4.	Find the volume of a right rectangular prism with fractional edge lengths using unit cubes of the appropriate unit fraction edge lengths (e.g., using technology or concrete materials) and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = lwh and V = Bh to find volumes of right rectangular prisms with fractional edge lengths to solve real-world and other mathematical problems. (E)

Indiana Academic Standards

Mathematics

Grade **7** - Adopted: **2023**

STANDARD / STRAND		**Mathematics Process Standards**
PROFICIENCY STATEMENT / SUBSTRAND	PS.1:	Make sense of problems and persevere in solving them.
PROFICIENCY STATEMENT / SUBSTRAND	PS.2:	Reason abstractly and quantitatively.
PROFICIENCY STATEMENT / SUBSTRAND	PS.3:	Construct viable arguments and critique the reasoning of others.
PROFICIENCY STATEMENT / SUBSTRAND	PS.4:	Model with mathematics.
PROFICIENCY STATEMENT / SUBSTRAND	PS.5:	Use appropriate tools strategically.
PROFICIENCY STATEMENT / SUBSTRAND	PS.7:	Look for and make use of structure.
STANDARD / STRAND		**Grade 7 Mathematics**
PROFICIENCY STATEMENT / SUBSTRAND		**Geometry and Measurement – Learning Outcome: Students use scale drawings, the area and circumference of circles, and the volume of cylinders and other three-dimensional solids to solve real-world problems.**

INDICATOR / STANDARD	7.GM.3.	Solve real-world and other mathematical problems involving volume of cylinders and three-dimensional objects composed of right rectangular prisms. (E)

Indiana Academic Standards

Mathematics

Grade **8** - Adopted: **2023**

STANDARD / STRAND		Mathematics Process Standards
PROFICIENCY STATEMENT / SUBSTRAND	PS.1:	Make sense of problems and persevere in solving them.
PROFICIENCY STATEMENT / SUBSTRAND	PS.2:	Reason abstractly and quantitatively.
PROFICIENCY STATEMENT / SUBSTRAND	PS.3:	Construct viable arguments and critique the reasoning of others.
PROFICIENCY STATEMENT / SUBSTRAND	PS.4:	Model with mathematics.
PROFICIENCY STATEMENT / SUBSTRAND	PS.5:	Use appropriate tools strategically.
PROFICIENCY STATEMENT / SUBSTRAND	PS.7:	Look for and make use of structure.

STANDARD / STRAND		Grade 8 Mathematics
PROFICIENCY STATEMENT / SUBSTRAND		**Geometry and Measurement – Learning Outcome: Students explore transformations in the coordinate plane and are also expected to understand and explain the Pythagorean Theorem, its converse, and to use this relationship to solve problems and find distance on the coordinate plane.**
INDICATOR / STANDARD	8.GM.2.	Solve real-world and other mathematical problems involving volume of cones, spheres, and pyramids and surface area of spheres. (E)

Indiana Academic Standards

Science

Grade **5** - Adopted: **2023**

STANDARD / STRAND		Science and Engineering Practices
PROFICIENCY STATEMENT / SUBSTRAND	SEP.2.	Developing and using models
PROFICIENCY STATEMENT / SUBSTRAND	SEP.6.	Constructing explanations (for science) and designing solutions (for engineering)

PROFICIENCY STATEMENT / SUBSTRAND	SEP.8.	Obtaining, evaluating, and communicating information

STANDARD / STRAND		**Grade 5**
PROFICIENCY STATEMENT / SUBSTRAND	**3-5-ETS1-1.**	**Engineering Design**
INDICATOR / STANDARD	3-5-ETS1-1.	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

STANDARD / STRAND		**Grade 5**
PROFICIENCY STATEMENT / SUBSTRAND	**3-5-ETS1-2.**	**Engineering Design**
INDICATOR / STANDARD	3-5-ETS1-2.	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

STANDARD / STRAND		**Grade 5**
PROFICIENCY STATEMENT / SUBSTRAND	**3-5-ETS1-3.**	**Engineering Design**
INDICATOR / STANDARD	3-5-ETS1-3.	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Indiana Academic Standards

Science

Grade **6** - Adopted: **2023**

STANDARD / STRAND		**Science and Engineering Practices**
PROFICIENCY STATEMENT / SUBSTRAND	SEP.2.	Developing and using models
PROFICIENCY STATEMENT / SUBSTRAND	SEP.6.	Constructing explanations (for science) and designing solutions (for engineering)
PROFICIENCY STATEMENT / SUBSTRAND	SEP.8.	Obtaining, evaluating, and communicating information

STANDARD / STRAND		**Grade 6**
PROFICIENCY STATEMENT / SUBSTRAND	**MS-ETS1-1.**	**Engineering Design**

INDICATOR / STANDARD	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

STANDARD / STRAND		**Grade 6**
PROFICIENCY STATEMENT / SUBSTRAND	**MS-ETS1-2.**	**Engineering Design**
INDICATOR / STANDARD	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

STANDARD / STRAND		**Grade 6**
PROFICIENCY STATEMENT / SUBSTRAND	**MS-ETS1-4.**	**Engineering Design**
INDICATOR / STANDARD	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Indiana Academic Standards

Science

Grade **7** - Adopted: **2023**

STANDARD / STRAND		**Science and Engineering Practices**
PROFICIENCY STATEMENT / SUBSTRAND	SEP.2.	Developing and using models
PROFICIENCY STATEMENT / SUBSTRAND	SEP.6.	Constructing explanations (for science) and designing solutions (for engineering)
PROFICIENCY STATEMENT / SUBSTRAND	SEP.8.	Obtaining, evaluating, and communicating information

STANDARD / STRAND		**Grade 7**
PROFICIENCY STATEMENT / SUBSTRAND	**MS-ETS1-1.**	**Engineering Design**
INDICATOR / STANDARD	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

STANDARD / STRAND		**Grade 7**
PROFICIENCY STATEMENT / SUBSTRAND	**MS-ETS1-2.**	**Engineering Design**

INDICATOR / STANDARD	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
STANDARD / STRAND		**Grade 7**
PROFICIENCY STATEMENT / SUBSTRAND	**MS-ETS1-4.**	**Engineering Design**
INDICATOR / STANDARD	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Indiana Academic Standards

Science

Grade **8** - Adopted: **2023**

STANDARD / STRAND		**Science and Engineering Practices**
PROFICIENCY STATEMENT / SUBSTRAND	SEP.2.	Developing and using models
PROFICIENCY STATEMENT / SUBSTRAND	SEP.6.	Constructing explanations (for science) and designing solutions (for engineering)
PROFICIENCY STATEMENT / SUBSTRAND	SEP.8.	Obtaining, evaluating, and communicating information
STANDARD / STRAND		**Grade 8**
PROFICIENCY STATEMENT / SUBSTRAND	**MS-ESS3-4.**	**Earth and Human Activity**
INDICATOR / STANDARD	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
STANDARD / STRAND		**Grade 8**
PROFICIENCY STATEMENT / SUBSTRAND	**MS-ETS1-1.**	**Engineering Design**
INDICATOR / STANDARD	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
STANDARD / STRAND		**Grade 8**
PROFICIENCY STATEMENT / SUBSTRAND	**MS-ETS1-2.**	**Engineering Design**

INDICATOR / STANDARD	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

STANDARD / STRAND		**Grade 8**
PROFICIENCY STATEMENT / SUBSTRAND	**MS-ETS1-4.**	**Engineering Design**

INDICATOR / STANDARD	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Indiana Academic Standards

Technology Education

Grade **5** - Adopted: **2023**

STANDARD / STRAND		**Computer Science**
PROFICIENCY STATEMENT / SUBSTRAND		**Data & Information**
INDICATOR / STANDARD		**Learning Outcome: Students select aspects and portions of data to be transformed, clustered, and categorized to provide views and insights about the data.**

EXPECTATION / INDICATOR	3-5.DI.1.	Decompose problems and subproblems into parts as a means to solving complex problems. (E)

STANDARD / STRAND		**Computer Science**
PROFICIENCY STATEMENT / SUBSTRAND		**Computing Devices & Systems**
INDICATOR / STANDARD		**Learning Outcome: Students identify similarities between computing systems to troubleshoot common problems and choose appropriate combinations of hardware and software to accomplish desired tasks.**

EXPECTATION / INDICATOR	3-5.CD.2.	Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies. (E)

STANDARD / STRAND		**Computer Science**
PROFICIENCY STATEMENT / SUBSTRAND		**Programs & Algorithms**
INDICATOR / STANDARD		**Learning Outcome: Students collaboratively engage in computer program development with consideration of documenting design choices and giving appropriate attributions.**

EXPECTATION / INDICATOR	3-5.PA.1.	Collaborate with peers to implement problem-solving steps to create a variety of programming solutions. (E)

Indiana Academic Standards

Technology Education

Grade **6** - Adopted: **2023**

STANDARD / STRAND		**Computer Science**

PROFICIENCY STATEMENT / SUBSTRAND		**Data & Information**
INDICATOR / STANDARD		**Learning Outcome: Students identify and implement multiple means of representing complex algorithms to communicate how applications store data as a representation understandable by people.**
EXPECTATION / INDICATOR	6-8.DI.1.	Decompose (i.e., break down) problems into smaller, more manageable subsets by applying the algorithmic problem solving steps to make the possible solutions easier to follow, test, and debug. (E)
EXPECTATION / INDICATOR	6-8.DI.4.	Create visuals such as flowcharts, diagrams, and pseudocode to represent complex problems as algorithms. (E)
STANDARD / STRAND		**Computer Science**
PROFICIENCY STATEMENT / SUBSTRAND		**Computing Devices & Systems**
INDICATOR / STANDARD		**Learning Outcome: Students explain trade-offs, functionality, and accessibility of computer systems to improve the human-computer interaction.**
EXPECTATION / INDICATOR	6-8.CD.1.	Design projects that combine hardware and software components to collect and exchange data. (E)
EXPECTATION / INDICATOR	6-8.CD.2.	Systematically identify and fix problems (i.e., troubleshoot) with computing devices and their components (e.g., checklist, decision tree, flowchart).
STANDARD / STRAND		**Computer Science**
PROFICIENCY STATEMENT / SUBSTRAND		**Impact & Culture**
INDICATOR / STANDARD		**Learning Outcome: Students explain that society is faced with trade-offs due to the increasing globalization and automation that computing brings, as well as describe these trade-offs using multiple viewpoints from a diverse audience.**
EXPECTATION / INDICATOR	6-8.IC.3.	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact.

Indiana Academic Standards

Technology Education

Grade **7** - Adopted: **2023**

STANDARD / STRAND		**Computer Science**
PROFICIENCY STATEMENT / SUBSTRAND		**Data & Information**
INDICATOR / STANDARD		**Learning Outcome: Students identify and implement multiple means of representing complex algorithms to communicate how applications store data as a representation understandable by people.**
EXPECTATION / INDICATOR	6-8.DI.1.	Decompose (i.e., break down) problems into smaller, more manageable subsets by applying the algorithmic problem solving steps to make the possible solutions easier to follow, test, and debug. (E)
EXPECTATION / INDICATOR	6-8.DI.4.	Create visuals such as flowcharts, diagrams, and pseudocode to represent complex problems as algorithms. (E)

STANDARD / STRAND		**Computer Science**
PROFICIENCY STATEMENT / SUBSTRAND		**Computing Devices & Systems**
INDICATOR / STANDARD		**Learning Outcome: Students explain trade-offs, functionality, and accessibility of computer systems to improve the human-computer interaction.**
EXPECTATION / INDICATOR	6-8.CD.1.	Design projects that combine hardware and software components to collect and exchange data. (E)
EXPECTATION / INDICATOR	6-8.CD.2.	Systematically identify and fix problems (i.e., troubleshoot) with computing devices and their components (e.g., checklist, decision tree, flowchart).

STANDARD / STRAND		**Computer Science**
PROFICIENCY STATEMENT / SUBSTRAND		**Impact & Culture**
INDICATOR / STANDARD		**Learning Outcome: Students explain that society is faced with trade-offs due to the increasing globalization and automation that computing brings, as well as describe these trade-offs using multiple viewpoints from a diverse audience.**
EXPECTATION / INDICATOR	6-8.IC.3.	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact.

Indiana Academic Standards

Technology Education

Grade **8** - Adopted: **2023**

STANDARD / STRAND		**Computer Science**
PROFICIENCY STATEMENT / SUBSTRAND		**Data & Information**
INDICATOR / STANDARD		**Learning Outcome: Students identify and implement multiple means of representing complex algorithms to communicate how applications store data as a representation understandable by people.**
EXPECTATION / INDICATOR	6-8.DI.1.	Decompose (i.e., break down) problems into smaller, more manageable subsets by applying the algorithmic problem solving steps to make the possible solutions easier to follow, test, and debug. (E)
EXPECTATION / INDICATOR	6-8.DI.4.	Create visuals such as flowcharts, diagrams, and pseudocode to represent complex problems as algorithms. (E)

STANDARD / STRAND		**Computer Science**
PROFICIENCY STATEMENT / SUBSTRAND		**Computing Devices & Systems**
INDICATOR / STANDARD		**Learning Outcome: Students explain trade-offs, functionality, and accessibility of computer systems to improve the human-computer interaction.**
EXPECTATION / INDICATOR	6-8.CD.1.	Design projects that combine hardware and software components to collect and exchange data. (E)

EXPECTATION / INDICATOR	6-8.CD.2.	Systematically identify and fix problems (i.e., troubleshoot) with computing devices and their components (e.g., checklist, decision tree, flowchart).

STANDARD / STRAND		**Computer Science**
PROFICIENCY STATEMENT / SUBSTRAND		**Impact & Culture**
INDICATOR / STANDARD		**Learning Outcome: Students explain that society is faced with trade-offs due to the increasing globalization and automation that computing brings, as well as describe these trade-offs using multiple viewpoints from a diverse audience.**
EXPECTATION / INDICATOR	6-8.IC.3.	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact.

Iowa Student Standards

Mathematics

Grade **5** - Adopted: **2012**

STRAND / COURSE		**Mathematical Practices**
ESSENTIAL CONCEPT AND/OR SKILL	1	Make sense of problems and persevere in solving them.
ESSENTIAL CONCEPT AND/OR SKILL	2	Reason abstractly and quantitatively.
ESSENTIAL CONCEPT AND/OR SKILL	3	Construct viable arguments and critique the reasoning of others.
ESSENTIAL CONCEPT AND/OR SKILL	4	Model with mathematics.
ESSENTIAL CONCEPT AND/OR SKILL	5	Use appropriate tools strategically.
ESSENTIAL CONCEPT AND/OR SKILL	7	Look for and make use of structure.

STRAND / COURSE	**5.MD.**	**Measurement and Data 5.MD**
ESSENTIAL CONCEPT AND/OR SKILL	**5.MD.C.**	**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition. (5.MD.C)**
DETAILED DESCRIPTOR	5.MD.C.4.	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. (5.MD.C.4) (DOK 1,2)

STRAND / COURSE	**5.MD.**	**Measurement and Data 5.MD**

ESSENTIAL CONCEPT AND/OR SKILL	**5.MD.C.**	**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition. (5.MD.C)**
DETAILED DESCRIPTOR	**5.MD.C.5.**	**Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.**
GRADE LEVEL EXPECTATION	5.MD.C.5.a.	Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
GRADE LEVEL EXPECTATION	5.MD.C.5.b.	Apply the formulas V = l × w × h and V = b × h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.

Iowa Student Standards

Mathematics

Grade **6** - Adopted: **2012**

STRAND / COURSE		**Mathematical Practices**
ESSENTIAL CONCEPT AND/OR SKILL	1	Make sense of problems and persevere in solving them.
ESSENTIAL CONCEPT AND/OR SKILL	2	Reason abstractly and quantitatively.
ESSENTIAL CONCEPT AND/OR SKILL	3	Construct viable arguments and critique the reasoning of others.
ESSENTIAL CONCEPT AND/OR SKILL	4	Model with mathematics.
ESSENTIAL CONCEPT AND/OR SKILL	5	Use appropriate tools strategically.
ESSENTIAL CONCEPT AND/OR SKILL	7	Look for and make use of structure.
STRAND / COURSE	**6.G.**	**Geometry 6.G**
ESSENTIAL CONCEPT AND/OR SKILL	**6.G.A.**	**Solve real-world and mathematical problems involving area, surface area, and volume. (6.G.A)**

DETAILED DESCRIPTOR	6.G.A.2.	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. (6.G.A.2) (DOK 1,2)

Iowa Student Standards
Mathematics
Grade **7** - Adopted: **2012**

STRAND / COURSE		Mathematical Practices
ESSENTIAL CONCEPT AND/OR SKILL	1	Make sense of problems and persevere in solving them.
ESSENTIAL CONCEPT AND/OR SKILL	2	Reason abstractly and quantitatively.
ESSENTIAL CONCEPT AND/OR SKILL	3	Construct viable arguments and critique the reasoning of others.
ESSENTIAL CONCEPT AND/OR SKILL	4	Model with mathematics.
ESSENTIAL CONCEPT AND/OR SKILL	5	Use appropriate tools strategically.
ESSENTIAL CONCEPT AND/OR SKILL	7	Look for and make use of structure.

Iowa Student Standards
Mathematics
Grade **8** - Adopted: **2012**

STRAND / COURSE		Mathematical Practices
ESSENTIAL CONCEPT AND/OR SKILL	1	Make sense of problems and persevere in solving them.
ESSENTIAL CONCEPT AND/OR SKILL	2	Reason abstractly and quantitatively.
ESSENTIAL CONCEPT AND/OR SKILL	3	Construct viable arguments and critique the reasoning of others.

ESSENTIAL CONCEPT AND/OR SKILL	4	Model with mathematics.
ESSENTIAL CONCEPT AND/OR SKILL	5	Use appropriate tools strategically.
ESSENTIAL CONCEPT AND/OR SKILL	7	Look for and make use of structure.

STRAND / COURSE	**8.G.**	**Geometry 8.G**
ESSENTIAL CONCEPT AND/OR SKILL	**8.G.C.**	**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. (8.G.C)**
DETAILED DESCRIPTOR	8.G.C.9.	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. (8.G.C.9) (DOK 1,2)

Iowa Student Standards

Science

Grade **5** - Adopted: **2015**

STRAND / COURSE	**IA.3-5-ETS1.**	**Engineering Design**
ESSENTIAL CONCEPT AND/OR SKILL		**Students who demonstrate understanding can:**
DETAILED DESCRIPTOR	3-5-ETS1-1.	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
DETAILED DESCRIPTOR	3-5-ETS1-2.	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
DETAILED DESCRIPTOR	3-5-ETS1-3.	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Iowa Student Standards

Science

Grade **6** - Adopted: **2015**

STRAND / COURSE	**IA.MS-ETS1.**	**Engineering Design**
ESSENTIAL CONCEPT AND/OR SKILL		**Students who demonstrate understanding can:**
DETAILED DESCRIPTOR	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
DETAILED DESCRIPTOR	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

DETAILED DESCRIPTOR	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **6** - Adopted: **2016**

STRAND / COURSE	IA.CC.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
ESSENTIAL CONCEPT AND/OR SKILL		Key Ideas and Details
DETAILED DESCRIPTOR	RST.6-8.2.	Determine the central ideas or conclusions of a distinct from prior knowledge or opinions. (RST.6-8.2.)
DETAILED DESCRIPTOR	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. (RST.6-8.3.)

STRAND / COURSE	IA.CC.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
ESSENTIAL CONCEPT AND/OR SKILL		Craft and Structure
DETAILED DESCRIPTOR	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics. (RST.6-8.4.)
DETAILED DESCRIPTOR	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic. (RST.6-8.5.)

STRAND / COURSE	IA.CC.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
ESSENTIAL CONCEPT AND/OR SKILL		Integration of Knowledge and Ideas
DETAILED DESCRIPTOR	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. (RST.6-8.9.)

STRAND / COURSE	IA.CC.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
ESSENTIAL CONCEPT AND/OR SKILL		Range of Reading and Level of Text Complexity
DETAILED DESCRIPTOR	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently. (RST.6-8.10.)

STRAND / COURSE	IA.CC.WHST.6-8.	Writing Standards for Literacy Science, and Technical Subjects
ESSENTIAL CONCEPT AND/OR SKILL		Text Types and Purposes
DETAILED DESCRIPTOR	WHST.6-8.2.	Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
GRADE LEVEL EXPECTATION	WHST.6-8.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic. (WHST.6-8.2.)

STRAND / COURSE	IA.CC.WHST.6-8.	Writing Standards for Literacy Science, and Technical Subjects
ESSENTIAL CONCEPT AND/OR SKILL		**Production and Distribution of Writing**
DETAILED DESCRIPTOR	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (WHST.6-8.4.)
DETAILED DESCRIPTOR	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently. (WHST.6-8.6.)

Iowa Student Standards

Science

Grade **7** - Adopted: **2015**

STRAND / COURSE	IA.MS-ETS1.	Engineering Design
ESSENTIAL CONCEPT AND/OR SKILL		**Students who demonstrate understanding can:**
DETAILED DESCRIPTOR	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
DETAILED DESCRIPTOR	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
DETAILED DESCRIPTOR	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **7** - Adopted: **2016**

STRAND / COURSE	IA.CC.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
ESSENTIAL CONCEPT AND/OR SKILL		**Key Ideas and Details**
DETAILED DESCRIPTOR	RST.6-8.2.	Determine the central ideas or conclusions of a distinct from prior knowledge or opinions. (RST.6-8.2.)
DETAILED DESCRIPTOR	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. (RST.6-8.3.)

STRAND / COURSE	IA.CC.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
ESSENTIAL CONCEPT AND/OR SKILL		**Craft and Structure**
DETAILED DESCRIPTOR	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics. (RST.6-8.4.)
DETAILED DESCRIPTOR	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic. (RST.6-8.5.)

STRAND / COURSE	**IA.CC.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
ESSENTIAL CONCEPT AND/OR SKILL		**Integration of Knowledge and Ideas**
DETAILED DESCRIPTOR	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. (RST.6-8.9.)

STRAND / COURSE	**IA.CC.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
ESSENTIAL CONCEPT AND/OR SKILL		**Range of Reading and Level of Text Complexity**
DETAILED DESCRIPTOR	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently. (RST.6-8.10.)

STRAND / COURSE	**IA.CC.WHST.6-8.**	**Writing Standards for Literacy Science, and Technical Subjects**
ESSENTIAL CONCEPT AND/OR SKILL		**Text Types and Purposes**
DETAILED DESCRIPTOR	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
GRADE LEVEL EXPECTATION	WHST.6-8.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic. (WHST.6-8.2.)

STRAND / COURSE	**IA.CC.WHST.6-8.**	**Writing Standards for Literacy Science, and Technical Subjects**
ESSENTIAL CONCEPT AND/OR SKILL		**Production and Distribution of Writing**
DETAILED DESCRIPTOR	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (WHST.6-8.4.)
DETAILED DESCRIPTOR	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently. (WHST.6-8.6.)

Iowa Student Standards

Science

Grade **8** - Adopted: **2015**

STRAND / COURSE	**IA.MS-PS4.**	**Waves and Their Applications in Technologies for Information Transfer**
ESSENTIAL CONCEPT AND/OR SKILL		**Students who demonstrate understanding can:**
DETAILED DESCRIPTOR	MS-PS4-3.	Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.

STRAND / COURSE	**IA.MS-ESS3.**	**Earth and Human Activity**

ESSENTIAL CONCEPT AND/OR SKILL		**Students who demonstrate understanding can:**
DETAILED DESCRIPTOR	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
STRAND / COURSE	**IA.MS-ETS1.**	**Engineering Design**
ESSENTIAL CONCEPT AND/OR SKILL		**Students who demonstrate understanding can:**
DETAILED DESCRIPTOR	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
DETAILED DESCRIPTOR	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
DETAILED DESCRIPTOR	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **8** - Adopted: **2016**

STRAND / COURSE	**IA.CC.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
ESSENTIAL CONCEPT AND/OR SKILL		**Key Ideas and Details**
DETAILED DESCRIPTOR	RST.6-8.2.	Determine the central ideas or conclusions of a distinct from prior knowledge or opinions. (RST.6-8.2.)
DETAILED DESCRIPTOR	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. (RST.6-8.3.)
STRAND / COURSE	**IA.CC.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
ESSENTIAL CONCEPT AND/OR SKILL		**Craft and Structure**
DETAILED DESCRIPTOR	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics. (RST.6-8.4.)
DETAILED DESCRIPTOR	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic. (RST.6-8.5.)
STRAND / COURSE	**IA.CC.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
ESSENTIAL CONCEPT AND/OR SKILL		**Integration of Knowledge and Ideas**
DETAILED DESCRIPTOR	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. (RST.6-8.9.)

STRAND / COURSE	**IA.CC.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
ESSENTIAL CONCEPT AND/OR SKILL		**Range of Reading and Level of Text Complexity**
DETAILED DESCRIPTOR	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently. (RST.6-8.10.)

STRAND / COURSE	**IA.CC.WHST.6-8.**	**Writing Standards for Literacy Science, and Technical Subjects**
ESSENTIAL CONCEPT AND/OR SKILL		**Text Types and Purposes**
DETAILED DESCRIPTOR	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
GRADE LEVEL EXPECTATION	WHST.6-8.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic. (WHST.6-8.2.)

STRAND / COURSE	**IA.CC.WHST.6-8.**	**Writing Standards for Literacy Science, and Technical Subjects**
ESSENTIAL CONCEPT AND/OR SKILL		**Production and Distribution of Writing**
DETAILED DESCRIPTOR	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (WHST.6-8.4.)
DETAILED DESCRIPTOR	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently. (WHST.6-8.6.)

Iowa Student Standards
Technology Education
Grade **5** - Adopted: **2018**

STRAND / COURSE		**CSTA K-12 Computer Science Standards**
ESSENTIAL CONCEPT AND/OR SKILL	**CSTA.1B.**	**Level 1B (Ages 8-11)**
DETAILED DESCRIPTOR	**1B-AP.**	**Algorithms & Programming**
GRADE LEVEL EXPECTATION		**Program Development**
EXAMPLE	1B-AP-13.	Use an iterative process to plan the development of a program by including others'' perspectives and considering user preferences. (P1.1, P5.1)
EXAMPLE	1B-AP-16.	Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development. (P2.2)
EXAMPLE	1B-AP-17.	Describe choices made during program development using code comments, presentations, and demonstrations. (P7.2)

STRAND / COURSE		CSTA K-12 Computer Science Standards
ESSENTIAL CONCEPT AND/OR SKILL	CSTA.1 B.	Level 1B (Ages 8-11)
DETAILED DESCRIPTOR	1B-IC.	Impacts of Computing
GRADE LEVEL EXPECTATION		Culture
EXAMPLE	1B-IC-19.	Brainstorm ways to improve the accessibility and usability of technology products for the diverse needs and wants of users. (P1.2)

STRAND / COURSE		CSTA K-12 Computer Science Standards
ESSENTIAL CONCEPT AND/OR SKILL	CSTA.1 B.	Level 1B (Ages 8-11)
DETAILED DESCRIPTOR	1B-IC.	Impacts of Computing
GRADE LEVEL EXPECTATION		Social Interactions
EXAMPLE	1B-IC-20.	Seek diverse perspectives for the purpose of improving computational artifacts. (P1.1)

Iowa Student Standards
Technology Education
Grade **6** - Adopted: **2018**

STRAND / COURSE		CSTA K-12 Computer Science Standards
ESSENTIAL CONCEPT AND/OR SKILL	CSTA.2.	Level 2 (Ages 11-14)
DETAILED DESCRIPTOR	2-AP.	Algorithms & Programming
GRADE LEVEL EXPECTATION		Algorithms
EXAMPLE	2-AP-10.	Use flowcharts and/or pseudocode to address complex problems as algorithms. (P4.4, P4.1)

STRAND / COURSE		CSTA K-12 Computer Science Standards
ESSENTIAL CONCEPT AND/OR SKILL	CSTA.2.	Level 2 (Ages 11-14)
DETAILED DESCRIPTOR	2-AP.	Algorithms & Programming
GRADE LEVEL EXPECTATION		Modularity
EXAMPLE	2-AP-13.	Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. (P3.2)

STRAND / COURSE		CSTA K-12 Computer Science Standards

ESSENTIAL CONCEPT AND/OR SKILL	**CSTA.2.**	**Level 2 (Ages 11-14)**
DETAILED DESCRIPTOR	**2-AP.**	**Algorithms & Programming**
GRADE LEVEL EXPECTATION		**Program Development**
EXAMPLE	2-AP-15.	Seek and incorporate feedback from team members and users to refine a solution that meets user needs. (P2.3, P1.1)

STRAND / COURSE		**CSTA K-12 Computer Science Standards**
ESSENTIAL CONCEPT AND/OR SKILL	**CSTA.2.**	**Level 2 (Ages 11-14)**
DETAILED DESCRIPTOR	**2-IC.**	**Impacts of Computing**
GRADE LEVEL EXPECTATION		**Social Interactions**
EXAMPLE	2-IC-22.	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact. (P2.4, P5.2)

Iowa Student Standards

Technology Education

Grade **7** - Adopted: **2018**

STRAND / COURSE		**CSTA K-12 Computer Science Standards**
ESSENTIAL CONCEPT AND/OR SKILL	**CSTA.2.**	**Level 2 (Ages 11-14)**
DETAILED DESCRIPTOR	**2-AP.**	**Algorithms & Programming**
GRADE LEVEL EXPECTATION		**Algorithms**
EXAMPLE	2-AP-10.	Use flowcharts and/or pseudocode to address complex problems as algorithms. (P4.4, P4.1)

STRAND / COURSE		**CSTA K-12 Computer Science Standards**
ESSENTIAL CONCEPT AND/OR SKILL	**CSTA.2.**	**Level 2 (Ages 11-14)**
DETAILED DESCRIPTOR	**2-AP.**	**Algorithms & Programming**
GRADE LEVEL EXPECTATION		**Modularity**
EXAMPLE	2-AP-13.	Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. (P3.2)

STRAND / COURSE		**CSTA K-12 Computer Science Standards**

ESSENTIAL CONCEPT AND/OR SKILL	**CSTA.2.**	**Level 2 (Ages 11-14)**
DETAILED DESCRIPTOR	**2-AP.**	**Algorithms & Programming**
GRADE LEVEL EXPECTATION		**Program Development**
EXAMPLE	2-AP-15.	Seek and incorporate feedback from team members and users to refine a solution that meets user needs. (P2.3, P1.1)

STRAND / COURSE		**CSTA K-12 Computer Science Standards**
ESSENTIAL CONCEPT AND/OR SKILL	**CSTA.2.**	**Level 2 (Ages 11-14)**
DETAILED DESCRIPTOR	**2-IC.**	**Impacts of Computing**
GRADE LEVEL EXPECTATION		**Social Interactions**
EXAMPLE	2-IC-22.	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact. (P2.4, P5.2)

Iowa Student Standards
Technology Education
Grade **8** - Adopted: **2018**

STRAND / COURSE		**CSTA K-12 Computer Science Standards**
ESSENTIAL CONCEPT AND/OR SKILL	**CSTA.2.**	**Level 2 (Ages 11-14)**
DETAILED DESCRIPTOR	**2-AP.**	**Algorithms & Programming**
GRADE LEVEL EXPECTATION		**Algorithms**
EXAMPLE	2-AP-10.	Use flowcharts and/or pseudocode to address complex problems as algorithms. (P4.4, P4.1)

STRAND / COURSE		**CSTA K-12 Computer Science Standards**
ESSENTIAL CONCEPT AND/OR SKILL	**CSTA.2.**	**Level 2 (Ages 11-14)**
DETAILED DESCRIPTOR	**2-AP.**	**Algorithms & Programming**
GRADE LEVEL EXPECTATION		**Modularity**
EXAMPLE	2-AP-13.	Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. (P3.2)

STRAND / COURSE		**CSTA K-12 Computer Science Standards**

ESSENTIAL CONCEPT AND/OR SKILL	**CSTA.2.**	**Level 2 (Ages 11-14)**
DETAILED DESCRIPTOR	**2-AP.**	**Algorithms & Programming**
GRADE LEVEL EXPECTATION		**Program Development**
EXAMPLE	2-AP-15.	Seek and incorporate feedback from team members and users to refine a solution that meets user needs. (P2.3, P1.1)

STRAND / COURSE		**CSTA K-12 Computer Science Standards**
ESSENTIAL CONCEPT AND/OR SKILL	**CSTA.2.**	**Level 2 (Ages 11-14)**
DETAILED DESCRIPTOR	**2-IC.**	**Impacts of Computing**
GRADE LEVEL EXPECTATION		**Social Interactions**
EXAMPLE	2-IC-22.	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact. (P2.4, P5.2)

Kansas Academic Standards

Mathematics

Grade **5** - Adopted: **2017**

STANDARD	**MP.**	**Standards for Mathematical Practice**
BENCHMARK	MP.1.	Make sense of problems and persevere in solving them.
BENCHMARK	MP.2.	Reason abstractly and quantitatively.
BENCHMARK	MP.3.	Construct viable arguments and critique the reasoning of others.
BENCHMARK	MP.4.	Model with mathematics.
BENCHMARK	MP.5.	Use appropriate tools strategically.
BENCHMARK	MP.7.	Look for and make use of structure.

STANDARD	**5.MD.**	**Measurement and Data**
BENCHMARK		**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
INDICATOR / PROFICIENCY LEVEL	5.MD.4.	Measure volumes by counting unit cubes such as cubic cm, cubic in, cubic ft. or nonstandard cubic units.

STANDARD	**5.MD.**	**Measurement and Data**
BENCHMARK		**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**

INDICATOR / PROFICIENCY LEVEL	5.MD.5.	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.
INDICATOR	5.MD.5a.	Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent three-dimensional whole-number products as volumes, (e.g. to represent the associative property of multiplication.)
INDICATOR	5.MD.5b.	Apply the formulas V = l x w x h and V = B x h (B represents the area of the base) for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.

Kansas Academic Standards

Mathematics

Grade **6** - Adopted: **2017**

STANDARD	MP.	Standards for Mathematical Practice
BENCHMARK	MP.1.	Make sense of problems and persevere in solving them.
BENCHMARK	MP.2.	Reason abstractly and quantitatively.
BENCHMARK	MP.3.	Construct viable arguments and critique the reasoning of others.
BENCHMARK	MP.4.	Model with mathematics.
BENCHMARK	MP.5.	Use appropriate tools strategically.
BENCHMARK	MP.7.	Look for and make use of structure.
STANDARD	**6.G.**	**Geometry**
BENCHMARK		**Solve real-world and mathematical problems involving area, surface area, and volume.**
INDICATOR / PROFICIENCY LEVEL	6.G.2.	Find the volume of a right rectangular prism with fractional edge lengths by applying the formulas V = lwh and V = Bh (B is the area of the base and h is the height) to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. (Builds on the 5th grade concept of packing unit cubes to find the volume of a rectangular prism with whole number edge lengths.)

Kansas Academic Standards

Mathematics

Grade **7** - Adopted: **2017**

STANDARD	MP.	Standards for Mathematical Practice
BENCHMARK	MP.1.	Make sense of problems and persevere in solving them.
BENCHMARK	MP.2.	Reason abstractly and quantitatively.
BENCHMARK	MP.3.	Construct viable arguments and critique the reasoning of others.
BENCHMARK	MP.4.	Model with mathematics.

BENCHMARK	MP.5.	Use appropriate tools strategically.
BENCHMARK	MP.7.	Look for and make use of structure.
STANDARD	**7.G.**	**Geometry**
BENCHMARK		**Solve real-life and mathematical problems involving area, surface area, and volume.**
INDICATOR / PROFICIENCY LEVEL	**7.G.5.**	**Investigate the relationship between three-dimensional geometric shapes;**
INDICATOR	7.G.5a.	Generalize the volume formula for prisms and cylinders (V = Bh where B is the base and h is the height).

Kansas Academic Standards

Mathematics

Grade **8** - Adopted: **2017**

STANDARD	**MP.**	**Standards for Mathematical Practice**
BENCHMARK	MP.1.	Make sense of problems and persevere in solving them.
BENCHMARK	MP.2.	Reason abstractly and quantitatively.
BENCHMARK	MP.3.	Construct viable arguments and critique the reasoning of others.
BENCHMARK	MP.4.	Model with mathematics.
BENCHMARK	MP.5.	Use appropriate tools strategically.
BENCHMARK	MP.7.	Look for and make use of structure.
BENCHMARK	MP.8.	Look for and express regularity in repeated reasoning.

Kansas Academic Standards

Science

Grade **5** - Adopted: **2013**

STANDARD	**KS.3-5-ETS.**	**ENGINEERING DESIGN**
BENCHMARK	**3-5-ETS1.**	**Engineering Design**
INDICATOR / PROFICIENCY LEVEL		**Students who demonstrate understanding can:**
INDICATOR	3-5-ETS1-1.	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
INDICATOR	3-5-ETS1-2.	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
INDICATOR	3-5-ETS1-3.	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Kansas Academic Standards

Science

Grade **6** - Adopted: **2013**

STANDARD	**KS.MS-ESS.**	**EARTH AND SPACE SCIENCE**
BENCHMARK	**MS-ESS3.**	**Earth and Human Activity**
INDICATOR / PROFICIENCY LEVEL		**Students who demonstrate understanding can:**
INDICATOR	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

STANDARD	**KS.MS-ETS.**	**ENGINEERING DESIGN**
BENCHMARK	**MS-ETS1.**	**Engineering Design**
INDICATOR / PROFICIENCY LEVEL		**Students who demonstrate understanding can:**
INDICATOR	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
INDICATOR	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
INDICATOR	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **6** - Adopted: **2010**

STANDARD	**KS.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Key Ideas and Details**
INDICATOR / PROFICIENCY LEVEL	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
INDICATOR / PROFICIENCY LEVEL	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

STANDARD	**KS.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Craft and Structure**
INDICATOR / PROFICIENCY LEVEL	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.

INDICATOR / PROFICIENCY LEVEL	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

STANDARD	**KS.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Integration of Knowledge and Ideas**

INDICATOR / PROFICIENCY LEVEL	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

STANDARD	**KS.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Range of Reading and Level of Text Complexity**

INDICATOR / PROFICIENCY LEVEL	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

STANDARD	**KS.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Text Types and Purposes**
INDICATOR / PROFICIENCY LEVEL	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**

INDICATOR	WHST.6-8.2(d)	Use precise language and domain-specific vocabulary to inform about or explain the topic.

STANDARD	**KS.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Production and Distribution of Writing**

INDICATOR / PROFICIENCY LEVEL	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

INDICATOR / PROFICIENCY LEVEL	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Kansas Academic Standards

Science

Grade **7** - Adopted: **2013**

STANDARD	**KS.MS-ESS.**	**EARTH AND SPACE SCIENCE**
BENCHMARK	**MS-ESS3.**	**Earth and Human Activity**
INDICATOR / PROFICIENCY LEVEL		**Students who demonstrate understanding can:**

INDICATOR	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

STANDARD	**KS.MS-ETS.**	**ENGINEERING DESIGN**
BENCHMARK	**MS-ETS1.**	**Engineering Design**
INDICATOR / PROFICIENCY LEVEL		**Students who demonstrate understanding can:**
INDICATOR	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
INDICATOR	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
INDICATOR	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **7** - Adopted: **2010**

STANDARD	**KS.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Key Ideas and Details**
INDICATOR / PROFICIENCY LEVEL	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
INDICATOR / PROFICIENCY LEVEL	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

STANDARD	**KS.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Craft and Structure**
INDICATOR / PROFICIENCY LEVEL	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
INDICATOR / PROFICIENCY LEVEL	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

STANDARD	**KS.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Integration of Knowledge and Ideas**
INDICATOR / PROFICIENCY LEVEL	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

STANDARD	**KS.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Range of Reading and Level of Text Complexity**
INDICATOR / PROFICIENCY LEVEL	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

STANDARD	**KS.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Text Types and Purposes**
INDICATOR / PROFICIENCY LEVEL	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
INDICATOR	WHST.6-8.2(d)	Use precise language and domain-specific vocabulary to inform about or explain the topic.

STANDARD	**KS.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Production and Distribution of Writing**
INDICATOR / PROFICIENCY LEVEL	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
INDICATOR / PROFICIENCY LEVEL	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Kansas Academic Standards

Science

Grade **8** - Adopted: **2013**

STANDARD	**KS.MS-ESS.**	**EARTH AND SPACE SCIENCE**
BENCHMARK	**MS-ESS3.**	**Earth and Human Activity**
INDICATOR / PROFICIENCY LEVEL		**Students who demonstrate understanding can:**
INDICATOR	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

STANDARD	**KS.MS-ETS.**	**ENGINEERING DESIGN**
BENCHMARK	**MS-ETS1.**	**Engineering Design**
INDICATOR / PROFICIENCY LEVEL		**Students who demonstrate understanding can:**

INDICATOR	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
INDICATOR	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
INDICATOR	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **8** - Adopted: **2010**

STANDARD	**KS.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Key Ideas and Details**
INDICATOR / PROFICIENCY LEVEL	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
INDICATOR / PROFICIENCY LEVEL	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
STANDARD	**KS.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Craft and Structure**
INDICATOR / PROFICIENCY LEVEL	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
INDICATOR / PROFICIENCY LEVEL	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
STANDARD	**KS.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Integration of Knowledge and Ideas**
INDICATOR / PROFICIENCY LEVEL	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
STANDARD	**KS.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Range of Reading and Level of Text Complexity**
INDICATOR / PROFICIENCY LEVEL	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.
STANDARD	**KS.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**

BENCHMARK		**Text Types and Purposes**
INDICATOR / PROFICIENCY LEVEL	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
INDICATOR	WHST.6-8.2(d)	Use precise language and domain-specific vocabulary to inform about or explain the topic.

STANDARD	**KS.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
BENCHMARK		**Production and Distribution of Writing**
INDICATOR / PROFICIENCY LEVEL	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
INDICATOR / PROFICIENCY LEVEL	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Kansas Academic Standards

Technology Education

Grade **5** - Adopted: **2019**

STANDARD		**Computer Science Standards – Grade 5**
BENCHMARK		**Algorithms and Programming**
INDICATOR / PROFICIENCY LEVEL		**Modularity**
INDICATOR	5.AP.M.02.	With grade appropriate complexity, modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.

STANDARD		**Computer Science Standards – Grade 5**
BENCHMARK		**Algorithms and Programming**
INDICATOR / PROFICIENCY LEVEL		**Program Development**
INDICATOR	5.AP.PD.04.	Take on varying roles collaborating with peers to give feedback at different stages of program development, including design and implementation.

Kansas Academic Standards

Technology Education

Grade **6** - Adopted: **2019**

STANDARD		**Computer Science Standards - Middle Grades**
BENCHMARK		**Algorithms and Programing**
INDICATOR / PROFICIENCY LEVEL		**Program Development**
INDICATOR	MG.AP.PD.01.	Seek and incorporate feedback from team members and users to refine a solution to a problem that meets the needs of diverse users.

STANDARD		**Computer Science Standards - Middle Grades**
BENCHMARK		**Impacts of Computing**
INDICATOR / PROFICIENCY LEVEL		**Community Partnerships**
INDICATOR	MG.IC.CP.01.	Formulate a computer-science based solution for a problem or issue by gathering input from local / regional industry members.

Kansas Academic Standards

Technology Education

Grade **7** - Adopted: **2019**

STANDARD		**Computer Science Standards - Middle Grades**
BENCHMARK		**Algorithms and Programing**
INDICATOR / PROFICIENCY LEVEL		**Program Development**
INDICATOR	MG.AP.PD.01.	Seek and incorporate feedback from team members and users to refine a solution to a problem that meets the needs of diverse users.

STANDARD		**Computer Science Standards - Middle Grades**
BENCHMARK		**Impacts of Computing**
INDICATOR / PROFICIENCY LEVEL		**Community Partnerships**
INDICATOR	MG.IC.CP.01.	Formulate a computer-science based solution for a problem or issue by gathering input from local / regional industry members.

Kansas Academic Standards

Technology Education

Grade **8** - Adopted: **2019**

STANDARD		**Computer Science Standards - Middle Grades**
BENCHMARK		**Algorithms and Programing**
INDICATOR / PROFICIENCY LEVEL		**Program Development**
INDICATOR	MG.AP.PD.01.	Seek and incorporate feedback from team members and users to refine a solution to a problem that meets the needs of diverse users.

STANDARD		**Computer Science Standards - Middle Grades**
BENCHMARK		**Impacts of Computing**
INDICATOR / PROFICIENCY LEVEL		**Community Partnerships**
INDICATOR	MG.IC.CP.01.	Formulate a computer-science based solution for a problem or issue by gathering input from local / regional industry members.

Kentucky Academic Standards

Mathematics

Grade **5** - Adopted: **2019**

STRAND		Standards for Mathematical Practices
CATEGORY / GOAL	MP.1.	Make sense of problems and persevere in solving them.
CATEGORY / GOAL	MP.2.	Reason abstractly and quantitatively.
CATEGORY / GOAL	MP.3.	Construct viable arguments and critique the reasoning of others.
CATEGORY / GOAL	MP.4.	Model with mathematics.
CATEGORY / GOAL	MP.5.	Use appropriate tools strategically.
CATEGORY / GOAL	MP.7.	Look for and make use of structure.

STRAND		Measurement and Data
CATEGORY / GOAL		**Cluster: Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
STANDARD / ORGANIZER	KY.5.MD.4.	Measure volumes by counting unit cubic cm, cubic in, cubic ft. and improvised units. (MP.5, MP.6)

STRAND		Measurement and Data
CATEGORY / GOAL		**Cluster: Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
STANDARD / ORGANIZER	**KY.5.MD.5.**	**Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. (MP.1, MP.4, MP.8)**
EXPECTATION	KY.5.MD.5.a.	Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes.
EXPECTATION	KY.5.MD.5.b.	Apply the formulas V=l×w×h and V=B×h for rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.

Kentucky Academic Standards

Mathematics

Grade **6** - Adopted: **2019**

STRAND		Standards for Mathematical Practices
CATEGORY / GOAL	MP.1.	Make sense of problems and persevere in solving them.
CATEGORY / GOAL	MP.2.	Reason abstractly and quantitatively.

CATEGORY / GOAL	MP.3.	Construct viable arguments and critique the reasoning of others.
CATEGORY / GOAL	MP.4.	Model with mathematics.
CATEGORY / GOAL	MP.5.	Use appropriate tools strategically.
CATEGORY / GOAL	MP.7.	Look for and make use of structure.
STRAND		**Geometry**
CATEGORY / GOAL		**Cluster: Solve real-world and mathematical problems involving area, surface area and volume.**
STANDARD / ORGANIZER	KY.6.G.2.	Find the volume of a right rectangular prism with rational number edge lengths. Apply the formulas V=lwh and V=Bh to find volumes of right rectangular prisms with rational number edge lengths in the context of solving real-world and mathematical problems. (MP.2, MP.5, MP.6)

Kentucky Academic Standards

Mathematics

Grade **7** - Adopted: **2019**

STRAND		**Standards for Mathematical Practices**
CATEGORY / GOAL	MP.1.	Make sense of problems and persevere in solving them.
CATEGORY / GOAL	MP.2.	Reason abstractly and quantitatively.
CATEGORY / GOAL	MP.3.	Construct viable arguments and critique the reasoning of others.
CATEGORY / GOAL	MP.4.	Model with mathematics.
CATEGORY / GOAL	MP.5.	Use appropriate tools strategically.
CATEGORY / GOAL	MP.7.	Look for and make use of structure.

Kentucky Academic Standards

Mathematics

Grade **8** - Adopted: **2019**

STRAND		**Standards for Mathematical Practices**
CATEGORY / GOAL	MP.1.	Make sense of problems and persevere in solving them.

CATEGORY / GOAL	MP.2.	Reason abstractly and quantitatively.
CATEGORY / GOAL	MP.3.	Construct viable arguments and critique the reasoning of others.
CATEGORY / GOAL	MP.4.	Model with mathematics.
CATEGORY / GOAL	MP.5.	Use appropriate tools strategically.
CATEGORY / GOAL	MP.7.	Look for and make use of structure.
CATEGORY / GOAL	MP.8.	Look for and express regularity in repeated reasoning.
STRAND		**Geometry**
CATEGORY / GOAL		**Cluster: Solve real-world and mathematical problems involving volume of cylinders, cones and spheres.**
STANDARD / ORGANIZER	KY.8.G.9.	Apply the formulas for the volumes and surface areas of cones, cylinders and spheres and use them to solve real-world and mathematical problems. (MP.1, MP.7, MP.8)

Kentucky Academic Standards

Science

Grade **5** - Adopted: **2022**

STRAND		**3-5 Engineering Design**
CATEGORY / GOAL	3-5-ETS1-1.	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
CATEGORY / GOAL	3-5-ETS1-2.	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
CATEGORY / GOAL	3-5-ETS1-3.	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Kentucky Academic Standards

Science

Grade **6** - Adopted: **2022**

STRAND		**6-8 Engineering Design**
CATEGORY / GOAL	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
CATEGORY / GOAL	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

CATEGORY / GOAL	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Kentucky Academic Standards

Science

Grade **7** - Adopted: **2022**

STRAND		6-8 Engineering Design
CATEGORY / GOAL	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
CATEGORY / GOAL	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
CATEGORY / GOAL	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Kentucky Academic Standards

Science

Grade **8** - Adopted: **2022**

STRAND		Eighth Grade
CATEGORY / GOAL	8-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
STRAND		**6-8 Engineering Design**
CATEGORY / GOAL	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
CATEGORY / GOAL	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
CATEGORY / GOAL	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Kentucky Academic Standards

Technology Education

Grade **5** - Adopted: **2018**

STRAND		Kentucky Academic Standards (KAS) for Computer Science
CATEGORY / GOAL		**Algorithms and Programming**
STANDARD / ORGANIZER	**E-AP-01.**	**Create, follow, compare and refine algorithms for a task. Algorithms (step-by-step instructions) are common in many primary classrooms. Just as people use algorithms to complete daily routines, they can program computers to use algorithms to complete different tasks. Algorithms are commonly implemented using a precise language that computers can interpret. Different algorithms can be used to perform the same task. While the end results may be similar, the paths may be different. Students should be able to look at different ways to solve the same task and decide which would be the best solution. Algorithms can be expressed in non-computer languages, including natural language, flowcharts, and pseudocode.**
EXPECTATION		**Algorithms**

INDICATOR	E-AP-01.5.	Modify a set of algorithms and discuss how multiple paths can lead to the same solution.

Grade **5** - Adopted: **2015**

STRAND		**Technology – Intermediate**
CATEGORY / GOAL		**Big Idea: Information, Communication and Productivity – Students demonstrate a sound understanding of the nature and operations of technology systems. Students use technology to learn, to communicate, increase productivity and become competent users of technology. Students manage and create effective oral, written and multimedia communication in a variety of forms and contexts.**
STANDARD / ORGANIZER		**Academic Expectations**
EXPECTATION	I.BI1.AE.6.1.	Students connect knowledge and experiences from different subject areas.

STRAND		**Technology – Intermediate**
CATEGORY / GOAL		**Big Idea: Research, Inquiry/Problem-Solving and Innovation – Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.**
STANDARD / ORGANIZER		**Academic Expectations**
EXPECTATION	I.BI3.AE.5.5.	Students use problem-solving processes to develop solutions to relatively complex problems.
EXPECTATION	I.BI3.AE.6.1.	Students connect knowledge and experiences from different subject areas.

STRAND		**Technology – Intermediate**
CATEGORY / GOAL		**Big Idea: Research, Inquiry/Problem-Solving and Innovation – Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.**
STANDARD / ORGANIZER		**Intermediate Enduring Knowledge – Understandings**
EXPECTATION	I.BI3.EK.1.	Technology assists in gathering, organizing and evaluating information from a variety of sources to answer essential questions.
EXPECTATION	I.BI3.EK.2.	Technology supports critical thinking skills used in inquiry/problem solving to make informed decisions.
EXPECTATION	I.BI3.EK.3.	Technology is used to produce an innovative product or system.

STRAND		**Technology – Intermediate**
CATEGORY / GOAL		**Big Idea: Research, Inquiry/Problem-Solving and Innovation – Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.**
STANDARD / ORGANIZER		**Intermediate Skills and Concepts – Inquiry/Problem-solving**
EXPECTATION	I.BI3.SC2.2.	Use technology to solve problems using critical thinking and problem-solving strategies.

EXPECTATION	I.BI3.SC2.3.	Solve content-specific problems using a combination of technologies.

STRAND		**Technology – Intermediate**
CATEGORY / GOAL		**Big Idea: Research, Inquiry/Problem-Solving and Innovation – Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.**
STANDARD / ORGANIZER		**Intermediate Skills and Concepts – Innovation**
EXPECTATION	I.BI3.SC3.1.	Use technology to organize and develop creative solutions, ideas or product.

Kentucky Academic Standards

Technology Education

Grade **6** - Adopted: **2015**

STRAND		**Technology – Middle**
CATEGORY / GOAL		**Big Idea: Information, Communication and Productivity – Students demonstrate a sound understanding of the nature and operations of technology systems. Students use technology to learn, to communicate, increase productivity and become competent users of technology. Students manage and create effective oral, written and multimedia communication in a variety of forms and contexts.**
STANDARD / ORGANIZER		**Academic Expectations**
EXPECTATION	M.BI1.AE.6.1.	Students connect knowledge and experiences from different subject areas.

STRAND		**Technology – Middle**
CATEGORY / GOAL		**Big Idea: Research, Inquiry/Problem-Solving and Innovation – Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.**
STANDARD / ORGANIZER		**Academic Expectations**
EXPECTATION	M.BI3.AE.5.5.	Students use problem-solving processes to develop solutions to relatively complex problems.
EXPECTATION	M.BI3.AE.6.1.	Students connect knowledge and experiences from different subject areas.

STRAND		**Technology – Middle**
CATEGORY / GOAL		**Big Idea: Research, Inquiry/Problem-Solving and Innovation – Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.**
STANDARD / ORGANIZER		**Middle Enduring Knowledge – Understandings**
EXPECTATION	M.BI3.EK.2.	Technology supports critical thinking skills used in inquiry/problem solving to make informed decisions.
EXPECTATION	M.BI3.EK.4.	Technology is used to analyze real world data through inquiry/problem solving in order to produce results.

EXPECTATION	M.BI3.EK.5.	Technology problem solving strategies is applied to innovative design for authentic, creative and real-world applications.

STRAND		**Technology – Middle**
CATEGORY / GOAL		**Big Idea: Research, Inquiry/Problem-Solving and Innovation – Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.**
STANDARD / ORGANIZER		**Middle Skills and Concepts – Inquiry/Problem-solving**

EXPECTATION	M.BI3.SC2.1.	Use appropriate technology and strategies to solve content-specific problems in the real-world.

Kentucky Academic Standards

Technology Education

Grade **7** - Adopted: **2015**

STRAND		**Technology – Middle**
CATEGORY / GOAL		**Big Idea: Information, Communication and Productivity – Students demonstrate a sound understanding of the nature and operations of technology systems. Students use technology to learn, to communicate, increase productivity and become competent users of technology. Students manage and create effective oral, written and multimedia communication in a variety of forms and contexts.**
STANDARD / ORGANIZER		**Academic Expectations**

EXPECTATION	M.BI1.AE.6.1.	Students connect knowledge and experiences from different subject areas.

STRAND		**Technology – Middle**
CATEGORY / GOAL		**Big Idea: Research, Inquiry/Problem-Solving and Innovation – Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.**
STANDARD / ORGANIZER		**Academic Expectations**

EXPECTATION	M.BI3.AE.5.5.	Students use problem-solving processes to develop solutions to relatively complex problems.

EXPECTATION	M.BI3.AE.6.1.	Students connect knowledge and experiences from different subject areas.

STRAND		**Technology – Middle**
CATEGORY / GOAL		**Big Idea: Research, Inquiry/Problem-Solving and Innovation – Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.**
STANDARD / ORGANIZER		**Middle Enduring Knowledge – Understandings**

EXPECTATION	M.BI3.EK.2.	Technology supports critical thinking skills used in inquiry/problem solving to make informed decisions.

EXPECTATION	M.BI3.EK.4.	Technology is used to analyze real world data through inquiry/problem solving in order to produce results.

EXPECTATION	M.BI3.EK.5.	Technology problem solving strategies is applied to innovative design for authentic, creative and real-world applications.

STRAND		**Technology – Middle**
CATEGORY / GOAL		**Big Idea: Research, Inquiry/Problem-Solving and Innovation – Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.**
STANDARD / ORGANIZER		**Middle Skills and Concepts – Inquiry/Problem-solving**

EXPECTATION	M.BI3.SC2.1.	Use appropriate technology and strategies to solve content-specific problems in the real-world.

Kentucky Academic Standards

Technology Education

Grade **8** - Adopted: **2015**

STRAND		**Technology – Middle**
CATEGORY / GOAL		**Big Idea: Information, Communication and Productivity – Students demonstrate a sound understanding of the nature and operations of technology systems. Students use technology to learn, to communicate, increase productivity and become competent users of technology. Students manage and create effective oral, written and multimedia communication in a variety of forms and contexts.**
STANDARD / ORGANIZER		**Academic Expectations**

EXPECTATION	M.BI1.AE.6.1.	Students connect knowledge and experiences from different subject areas.

STRAND		**Technology – Middle**
CATEGORY / GOAL		**Big Idea: Research, Inquiry/Problem-Solving and Innovation – Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.**
STANDARD / ORGANIZER		**Academic Expectations**

EXPECTATION	M.BI3.AE.5.5.	Students use problem-solving processes to develop solutions to relatively complex problems.

EXPECTATION	M.BI3.AE.6.1.	Students connect knowledge and experiences from different subject areas.

STRAND		**Technology – Middle**
CATEGORY / GOAL		**Big Idea: Research, Inquiry/Problem-Solving and Innovation – Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.**
STANDARD / ORGANIZER		**Middle Enduring Knowledge – Understandings**

EXPECTATION	M.BI3.EK.2.	Technology supports critical thinking skills used in inquiry/problem solving to make informed decisions.

EXPECTATION	M.BI3.EK.4.	Technology is used to analyze real world data through inquiry/problem solving in order to produce results.

EXPECTATION	M.BI3.EK.5.	Technology problem solving strategies is applied to innovative design for authentic, creative and real-world applications.

STRAND		**Technology – Middle**
CATEGORY / GOAL		**Big Idea: Research, Inquiry/Problem-Solving and Innovation – Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.**
STANDARD / ORGANIZER		**Middle Skills and Concepts – Inquiry/Problem-solving**
EXPECTATION	M.BI3.SC2.1.	Use appropriate technology and strategies to solve content-specific problems in the real-world.

Louisiana Academic Standards

Mathematics

Grade **5** - Adopted: **2016/Updated 2017**

STRAND		**Standards for Mathematical Practice**
TITLE	MP.1.	Make sense of problems and persevere in solving them.
TITLE	MP.2.	Reason abstractly and quantitatively.
TITLE	MP.3.	Construct viable arguments and critique the reasoning of others.
TITLE	MP.4.	Model with mathematics.
TITLE	MP.5.	Use appropriate tools strategically.
TITLE	MP.7.	Look for and make use of structure.

STRAND	**5.MD.**	**Measurement and Data**
TITLE	**5.MD.C.**	**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
PERFORMANCE EXPECTATION	5.MD.C.4.	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

STRAND	**5.MD.**	**Measurement and Data**
TITLE	**5.MD.C.**	**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
PERFORMANCE EXPECTATION	**5.MD.C.5.**	**Relate volume to the operations of multiplication and addition and solve real-world and mathematical problems involving volume.**
INDICATOR	5.MD.C.5.a.	Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
INDICATOR	5.MD.C.5.b.	Apply the formulas V = l × w × h and V = B × h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real-world and mathematical problems.

Louisiana Academic Standards

Mathematics

Grade **6** - Adopted: **2016/Updated 2017**

STRAND		Standards for Mathematical Practice
TITLE	MP.1.	Make sense of problems and persevere in solving them.
TITLE	MP.2.	Reason abstractly and quantitatively.
TITLE	MP.3.	Construct viable arguments and critique the reasoning of others.
TITLE	MP.4.	Model with mathematics.
TITLE	MP.5.	Use appropriate tools strategically.
TITLE	MP.7.	Look for and make use of structure.
STRAND	**6.G.**	**Geometry**
TITLE	**6.G.A.**	**Solve real-world and mathematical problems involving area, surface area, and volume.**
PERFORMANCE EXPECTATION	6.G.A.2.	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = lwh and V = Bh to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

Louisiana Academic Standards

Mathematics

Grade **7** - Adopted: **2016/Updated 2017**

STRAND		Standards for Mathematical Practice
TITLE	MP.1.	Make sense of problems and persevere in solving them.
TITLE	MP.2.	Reason abstractly and quantitatively.
TITLE	MP.3.	Construct viable arguments and critique the reasoning of others.
TITLE	MP.4.	Model with mathematics.
TITLE	MP.5.	Use appropriate tools strategically.
TITLE	MP.7.	Look for and make use of structure.

Louisiana Academic Standards

Mathematics

Grade **8** - Adopted: **2016/Updated 2017**

STRAND		Standards for Mathematical Practice
TITLE	MP.1.	Make sense of problems and persevere in solving them.

TITLE	MP.2.	Reason abstractly and quantitatively.
TITLE	MP.3.	Construct viable arguments and critique the reasoning of others.
TITLE	MP.4.	Model with mathematics.
TITLE	MP.5.	Use appropriate tools strategically.
TITLE	MP.7.	Look for and make use of structure.
STRAND	**8.G.**	**Geometry**
TITLE	**8.G.C.**	**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.**
PERFORMANCE EXPECTATION	8.G.C.9.	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Louisiana Academic Standards
Science
Grade **6** - Adopted: **2017**

STRAND	**LA.SC.6.**	**Science – Grade 6**
TITLE	**6-MS-ESS1.**	**EARTH'S PLACE IN THE UNIVERSE**
PERFORMANCE EXPECTATION	6-MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Louisiana Academic Standards
Technology Education
Grade **5** - Adopted: **2008**

STRAND	**LA.ET.**	**Educational Technology**
TITLE		**PreK-12 Educational Technology Content Standards**
PERFORMANCE EXPECTATION	ET.4.	Critical Thinking, Problem Solving, and Decision Making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
STRAND	**LA.ET.**	**Educational Technology**
TITLE		**Performance Indicators for Grades 3-5**
PERFORMANCE EXPECTATION	ET.E.	Identify and investigate a world issue and generate a possible solution using digital tools and resources. (3, 4)

Louisiana Academic Standards
Technology Education
Grade **6** - Adopted: **2008**

STRAND	**LA.ET.**	**Educational Technology**
TITLE		**PreK-12 Educational Technology Content Standards**

PERFORMANCE EXPECTATION	ET.4.	Critical Thinking, Problem Solving, and Decision Making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

Louisiana Academic Standards

Technology Education

Grade **7** - Adopted: **2008**

STRAND	LA.ET.	Educational Technology
TITLE		PreK-12 Educational Technology Content Standards
PERFORMANCE EXPECTATION	ET.4.	Critical Thinking, Problem Solving, and Decision Making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

Louisiana Academic Standards

Technology Education

Grade **8** - Adopted: **2008**

STRAND	LA.ET.	Educational Technology
TITLE		PreK-12 Educational Technology Content Standards
PERFORMANCE EXPECTATION	ET.4.	Critical Thinking, Problem Solving, and Decision Making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

Maine Learning Results

Mathematics

Grade **5** - Adopted: **2020/Implemented 2020**

STRAND / DOMAIN		Standards for Mathematical Practice
CATEGORY / PERFORMANCE INDICATOR	MP1.	Make sense of problems and persevere in solving them: Students will plan strategies to use and persevere in solving math problems.
CATEGORY / PERFORMANCE INDICATOR	MP2.	Reason abstractly and quantitatively: Students will think about numbers in many ways and make sense of numerical relationships as they solve problems.
CATEGORY / PERFORMANCE INDICATOR	MP3.	Construct viable arguments and critique the reasoning of others: Students will explain their thinking and make sense of the thinking of others.
CATEGORY / PERFORMANCE INDICATOR	MP4.	Model with mathematics: Students will use representations to show their thinking in a variety of ways.
CATEGORY / PERFORMANCE INDICATOR	MP5.	Use appropriate tools strategically: Students will use math tools such as tables, diagrams, and technology to explore and deepen their understanding of concepts.
CATEGORY / PERFORMANCE INDICATOR	MP7.	Look for and make use of structure: Students will use their current mathematical understandings to identify patterns and structure to make sense of new learning.

STRAND / DOMAIN		**Statistical Reasoning – Measurement & Data**
CATEGORY / PERFORMANCE INDICATOR	**SR.C.7**	**Understand concepts of Geometric measurement: involving perimeter, area, and volume.**
STANDARD	5.MD.C.4:	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.

STRAND / DOMAIN		**Statistical Reasoning – Measurement & Data**
CATEGORY / PERFORMANCE INDICATOR	**SR.C.7**	**Understand concepts of Geometric measurement: involving perimeter, area, and volume.**
STANDARD	**5.MD.C.5:**	**Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. When finding volumes of objects answers will be in cubic units.**
EXPECTATION	5.MD.C.5a:	Find the volume of a right rectangular prism with whole -number edge lengths by packing it with unit cubes and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
EXPECTATION	5.MD.C.5b:	Apply the formulas V = l × w × h and V = B × h (where B stands for the area of the base) for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.

Maine Learning Results

Mathematics

Grade **6** - Adopted: **2020/Implemented 2020**

STRAND / DOMAIN		**Standards for Mathematical Practice**
CATEGORY / PERFORMANCE INDICATOR	MP1.	Make sense of problems and persevere in solving them: Students will plan strategies to use and persevere in solving math problems.
CATEGORY / PERFORMANCE INDICATOR	MP2.	Reason abstractly and quantitatively: Students will think about numbers in many ways and make sense of numerical relationships as they solve problems.
CATEGORY / PERFORMANCE INDICATOR	MP3.	Construct viable arguments and critique the reasoning of others: Students will explain their thinking and make sense of the thinking of others.
CATEGORY / PERFORMANCE INDICATOR	MP4.	Model with mathematics: Students will use representations to show their thinking in a variety of ways.
CATEGORY / PERFORMANCE INDICATOR	MP5.	Use appropriate tools strategically: Students will use math tools such as tables, diagrams, and technology to explore and deepen their understanding of concepts.
CATEGORY / PERFORMANCE INDICATOR	MP7.	Look for and make use of structure: Students will use their current mathematical understandings to identify patterns and structure to make sense of new learning.

STRAND / DOMAIN		Geometric Reasoning – Geometry
CATEGORY / PERFORMANCE INDICATOR	GR.EA.1	Solve real-world and mathematical problems involving angle measure, area, surface area, and volume.
STANDARD	6.G.A.2:	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = B h (where B stands for the area of the base) to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

Maine Learning Results

Mathematics

Grade **7** - Adopted: **2020/Implemented 2020**

STRAND / DOMAIN		Standards for Mathematical Practice
CATEGORY / PERFORMANCE INDICATOR	MP1.	Make sense of problems and persevere in solving them: Students will plan strategies to use and persevere in solving math problems.
CATEGORY / PERFORMANCE INDICATOR	MP2.	Reason abstractly and quantitatively: Students will think about numbers in many ways and make sense of numerical relationships as they solve problems.
CATEGORY / PERFORMANCE INDICATOR	MP3.	Construct viable arguments and critique the reasoning of others: Students will explain their thinking and make sense of the thinking of others.
CATEGORY / PERFORMANCE INDICATOR	MP4.	Model with mathematics: Students will use representations to show their thinking in a variety of ways.
CATEGORY / PERFORMANCE INDICATOR	MP5.	Use appropriate tools strategically: Students will use math tools such as tables, diagrams, and technology to explore and deepen their understanding of concepts.
CATEGORY / PERFORMANCE INDICATOR	MP7.	Look for and make use of structure: Students will use their current mathematical understandings to identify patterns and structure to make sense of new learning.

Maine Learning Results

Mathematics

Grade **8** - Adopted: **2020/Implemented 2020**

STRAND / DOMAIN		Standards for Mathematical Practice
CATEGORY / PERFORMANCE INDICATOR	MP1.	Make sense of problems and persevere in solving them: Students will plan strategies to use and persevere in solving math problems.
CATEGORY / PERFORMANCE INDICATOR	MP2.	Reason abstractly and quantitatively: Students will think about numbers in many ways and make sense of numerical relationships as they solve problems.

CATEGORY / PERFORMANCE INDICATOR	MP3.	Construct viable arguments and critique the reasoning of others: Students will explain their thinking and make sense of the thinking of others.
CATEGORY / PERFORMANCE INDICATOR	MP4.	Model with mathematics: Students will use representations to show their thinking in a variety of ways.
CATEGORY / PERFORMANCE INDICATOR	MP5.	Use appropriate tools strategically: Students will use math tools such as tables, diagrams, and technology to explore and deepen their understanding of concepts.
CATEGORY / PERFORMANCE INDICATOR	MP7.	Look for and make use of structure: Students will use their current mathematical understandings to identify patterns and structure to make sense of new learning.
STRAND / DOMAIN		**Geometric Reasoning – Geometry**
CATEGORY / PERFORMANCE INDICATOR	**GR.EA.1**	**Solve real-world and mathematical problems involving angle measure, area, surface area, and volume.**
STANDARD	8.G.C.9:	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Maine Learning Results

Science

Grade **5** - Adopted: **2019**

STRAND / DOMAIN	**NGSS.3-5-ETS.**	**ENGINEERING DESIGN**
CATEGORY / PERFORMANCE INDICATOR	**3-5-ETS1.**	**Engineering Design**
STANDARD		**Students who demonstrate understanding can:**
EXPECTATION	3-5-ETS1-1.	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
EXPECTATION	3-5-ETS1-2.	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
EXPECTATION	3-5-ETS1-3.	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Maine Learning Results

Science

Grade **6** - Adopted: **2019**

STRAND / DOMAIN	**NGSS.MS-ESS.**	**EARTH AND SPACE SCIENCE**
CATEGORY / PERFORMANCE INDICATOR	**MS-ESS3.**	**Earth and Human Activity**
STANDARD		**Students who demonstrate understanding can:**

EXPECTATION	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

STRAND / DOMAIN	NGSS.MS-ETS.	ENGINEERING DESIGN
CATEGORY / PERFORMANCE INDICATOR	MS-ETS1.	Engineering Design
STANDARD		Students who demonstrate understanding can:
EXPECTATION	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
EXPECTATION	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
EXPECTATION	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Maine Learning Results

Science

Grade **7** - Adopted: **2019**

STRAND / DOMAIN	NGSS.MS-ESS.	EARTH AND SPACE SCIENCE
CATEGORY / PERFORMANCE INDICATOR	MS-ESS3.	Earth and Human Activity
STANDARD		Students who demonstrate understanding can:
EXPECTATION	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

STRAND / DOMAIN	NGSS.MS-ETS.	ENGINEERING DESIGN
CATEGORY / PERFORMANCE INDICATOR	MS-ETS1.	Engineering Design
STANDARD		Students who demonstrate understanding can:
EXPECTATION	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
EXPECTATION	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
EXPECTATION	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Maine Learning Results

Science

Grade **8** - Adopted: **2019**

STRAND / DOMAIN	**NGSS.MS-ESS.**	**EARTH AND SPACE SCIENCE**
CATEGORY / PERFORMANCE INDICATOR	**MS-ESS3.**	**Earth and Human Activity**
STANDARD		**Students who demonstrate understanding can:**
EXPECTATION	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

STRAND / DOMAIN	**NGSS.MS-ETS.**	**ENGINEERING DESIGN**
CATEGORY / PERFORMANCE INDICATOR	**MS-ETS1.**	**Engineering Design**
STANDARD		**Students who demonstrate understanding can:**
EXPECTATION	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
EXPECTATION	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
EXPECTATION	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Maryland College and Career-Ready Standards

Mathematics

Grade **5** - Adopted: **2010**

STRAND / TOPIC / STANDARD		**Grade 5 Math**
TOPIC / INDICATOR	**5.MD.**	**Measurement and Data**
INDICATOR / PROFICIENCY LEVEL	**5.MD.C.**	**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
OBJECTIVE	5.MD.C.4.	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

STRAND / TOPIC / STANDARD		**Grade 5 Math**
TOPIC / INDICATOR	**5.MD.**	**Measurement and Data**
INDICATOR / PROFICIENCY LEVEL	**5.MD.C.**	**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
OBJECTIVE	**5.MD.C.5.**	**Relate volume to the operations of multiplication and addition, and solve real world and mathematical problems involving volume**

EXPECTATION	5.MD.C.5 a.	Find the volume of a right rectangular prism with whole- number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent three-fold whole-number products as volumes, e.g., to represent the associative property of multiplication
EXPECTATION	5.MD.C.5 b.	Apply the formulas V =(l)(w)(h) and V = (b)(h) for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems

Maryland College and Career-Ready Standards

Mathematics

Grade **6** - Adopted: **2010**

STRAND / TOPIC / STANDARD		**Grade 6 Math**
TOPIC / INDICATOR	**6.G.**	**Geometry**
INDICATOR / PROFICIENCY LEVEL	**6.G.A.**	**Solve real-world and mathematical problems involving area, surface area, and volume.**
OBJECTIVE	6.G.A.2.	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = lwh and V = Bh to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

Maryland College and Career-Ready Standards

Mathematics

Grade **8** - Adopted: **2010**

STRAND / TOPIC / STANDARD		**Grade 8 Math**
TOPIC / INDICATOR	**8.G.**	**Geometry**
INDICATOR / PROFICIENCY LEVEL	**8.G.C.**	**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres**
OBJECTIVE	8.G.C.9.	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Maryland College and Career-Ready Standards

Science

Grade **5** - Adopted: **2013**

STRAND / TOPIC / STANDARD	**NGSS.3-5-ETS.**	**ENGINEERING DESIGN**
TOPIC / INDICATOR	**3-5-ETS1.**	**Engineering Design**
INDICATOR / PROFICIENCY LEVEL		**Students who demonstrate understanding can:**
OBJECTIVE	3-5-ETS1-1.	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

OBJECTIVE	3-5-ETS1-2.	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
OBJECTIVE	3-5-ETS1-3.	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Maryland College and Career-Ready Standards

Science

Grade **6** - Adopted: **2013**

STRAND / TOPIC / STANDARD	NGSS.MS-ESS.	EARTH AND SPACE SCIENCE
TOPIC / INDICATOR	MS-ESS3.	Earth and Human Activity
INDICATOR / PROFICIENCY LEVEL		Students who demonstrate understanding can:
OBJECTIVE	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

STRAND / TOPIC / STANDARD	NGSS.MS-ETS.	ENGINEERING DESIGN
TOPIC / INDICATOR	MS-ETS1.	Engineering Design
INDICATOR / PROFICIENCY LEVEL		Students who demonstrate understanding can:
OBJECTIVE	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
OBJECTIVE	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
OBJECTIVE	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Maryland College and Career-Ready Standards

Science

Grade **7** - Adopted: **2013**

STRAND / TOPIC / STANDARD	NGSS.MS-ESS.	EARTH AND SPACE SCIENCE
TOPIC / INDICATOR	MS-ESS3.	Earth and Human Activity
INDICATOR / PROFICIENCY LEVEL		Students who demonstrate understanding can:
OBJECTIVE	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

STRAND / TOPIC / STANDARD	NGSS.MS-ETS.	ENGINEERING DESIGN
TOPIC / INDICATOR	MS-ETS1.	Engineering Design
INDICATOR / PROFICIENCY LEVEL		Students who demonstrate understanding can:
OBJECTIVE	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
OBJECTIVE	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
OBJECTIVE	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Maryland College and Career-Ready Standards

Science

Grade **8** - Adopted: **2013**

STRAND / TOPIC / STANDARD	NGSS.MS-ESS.	EARTH AND SPACE SCIENCE
TOPIC / INDICATOR	MS-ESS3.	Earth and Human Activity
INDICATOR / PROFICIENCY LEVEL		Students who demonstrate understanding can:
OBJECTIVE	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

STRAND / TOPIC / STANDARD	NGSS.MS-ETS.	ENGINEERING DESIGN
TOPIC / INDICATOR	MS-ETS1.	Engineering Design
INDICATOR / PROFICIENCY LEVEL		Students who demonstrate understanding can:
OBJECTIVE	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
OBJECTIVE	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
OBJECTIVE	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Maryland College and Career-Ready Standards

Technology Education

Grade **6** - Adopted: **2016**

STRAND / TOPIC / STANDARD		Maryland Technology Education Standards: Grades 6-8
TOPIC / INDICATOR		**Standard Three: Engineering Design and Development – Students will demonstrate knowledge of and apply the engineering design process to develop solutions to problems.**
INDICATOR / PROFICIENCY LEVEL		**Engineering design and development includes but is not limited to research and development, invention and innovation, problem solving, and using and maintaining technological products and systems.**
OBJECTIVE		**Explain how the design process is an iterative, systematic approach to problem solving that includes collaboratively:**
EXPECTATION		Defining a problem – students will be able to employ technical reading and writing skills to develop concise problem statement.
EXPECTATION		Selecting an Approach – students will be able to employ a decision matrix to select the best approach to solve the problem.
EXPECTATION		Testing and Evaluating Design Using Specifications – students will be able to use establish specifications to assess their design product.

STRAND / TOPIC / STANDARD		Maryland Technology Education Standards: Grades 6-8
TOPIC / INDICATOR		**Standard Three: Engineering Design and Development – Students will demonstrate knowledge of and apply the engineering design process to develop solutions to problems.**
INDICATOR / PROFICIENCY LEVEL		**Engineering design and development includes but is not limited to research and development, invention and innovation, problem solving, and using and maintaining technological products and systems.**
OBJECTIVE		Discriminate between ethical and unethical engineering practices.

STRAND / TOPIC / STANDARD		Maryland Technology Education Standards: Grades 6-8
TOPIC / INDICATOR		**Standard Four: Core Technologies and The Designed World – Students will demonstrate knowledge of the core technologies that underpin the designed world and major enterprises that produce the goods and services of the designed world. Core technologies include but are not limited to biotechnology, electrical, electronics, fluid, material, mechanical, optical, structural, and thermal technologies. Major enterprises include medical, agriculture, biotechnology, energy and power, information and communication, transportation, and manufacturing and construction technologies.**
INDICATOR / PROFICIENCY LEVEL		**Analyze the function of select core technologies in the designed world.**
OBJECTIVE		**Agricultural Technologies**
EXPECTATION		Design, develop, use, manage, maintain, and assess a closed system that supports living organisms (e.g. terrarium, hydroponics station).

STRAND / TOPIC / STANDARD		Maryland Technology Education Standards: Grades 6-8
TOPIC / INDICATOR		**Standard Four: Core Technologies and The Designed World – Students will demonstrate knowledge of the core technologies that underpin the designed world and major enterprises that produce the goods and services of the designed world. Core technologies include but are not limited to biotechnology, electrical, electronics, fluid, material, mechanical, optical, structural, and thermal technologies. Major enterprises include medical, agriculture, biotechnology, energy and power, information and communication, transportation, and manufacturing and construction technologies.**

INDICATOR / PROFICIENCY LEVEL		**Analyze the function of select core technologies in the designed world.**
OBJECTIVE		**Biotechnology**
EXPECTATION		Explore applications of biotechnology.
STRAND / TOPIC / STANDARD		**Maryland Technology Education Standards: Grades 6-8**
TOPIC / INDICATOR		**Standard Four: Core Technologies and The Designed World – Students will demonstrate knowledge of the core technologies that underpin the designed world and major enterprises that produce the goods and services of the designed world. Core technologies include but are not limited to biotechnology, electrical, electronics, fluid, material, mechanical, optical, structural, and thermal technologies. Major enterprises include medical, agriculture, biotechnology, energy and power, information and communication, transportation, and manufacturing and construction technologies.**
INDICATOR / PROFICIENCY LEVEL		**Analyze the function of select core technologies in the designed world.**
OBJECTIVE		**Energy and Power Technologies**
EXPECTATION		Design, construct, and test a device that either minimizes or maximizes energy transfer (MS-PS3-3).
STRAND / TOPIC / STANDARD		**Maryland Technology Education Standards: Grades 6-8**
TOPIC / INDICATOR		**Standard Five: Computational Thinking and Computer Science Applications – Students will be able to apply computational thinking skills and computer science applications as tools to develop solutions to engineering problems.**
INDICATOR / PROFICIENCY LEVEL		Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems.
INDICATOR / PROFICIENCY LEVEL		Use the basic steps in algorithmic problem solving to design solutions to problems.
INDICATOR / PROFICIENCY LEVEL		Implement problem solutions using a programming language.
INDICATOR / PROFICIENCY LEVEL		Analyze how computational thinking and computer programing can be used as tools for problem solving.

Maryland College and Career-Ready Standards

Technology Education

Grade **7** - Adopted: **2016**

STRAND / TOPIC / STANDARD		**Maryland Technology Education Standards: Grades 6-8**
TOPIC / INDICATOR		**Standard Three: Engineering Design and Development – Students will demonstrate knowledge of and apply the engineering design process to develop solutions to problems.**
INDICATOR / PROFICIENCY LEVEL		**Engineering design and development includes but is not limited to research and development, invention and innovation, problem solving, and using and maintaining technological products and systems.**

OBJECTIVE		**Explain how the design process is an iterative, systematic approach to problem solving that includes collaboratively:**
EXPECTATION		Defining a problem – students will be able to employ technical reading and writing skills to develop concise problem statement.
EXPECTATION		Selecting an Approach – students will be able to employ a decision matrix to select the best approach to solve the problem.
EXPECTATION		Testing and Evaluating Design Using Specifications – students will be able to use establish specifications to assess their design product.
STRAND / TOPIC / STANDARD		**Maryland Technology Education Standards: Grades 6-8**
TOPIC / INDICATOR		**Standard Three: Engineering Design and Development – Students will demonstrate knowledge of and apply the engineering design process to develop solutions to problems.**
INDICATOR / PROFICIENCY LEVEL		**Engineering design and development includes but is not limited to research and development, invention and innovation, problem solving, and using and maintaining technological products and systems.**
OBJECTIVE		Discriminate between ethical and unethical engineering practices.
STRAND / TOPIC / STANDARD		**Maryland Technology Education Standards: Grades 6-8**
TOPIC / INDICATOR		**Standard Four: Core Technologies and The Designed World – Students will demonstrate knowledge of the core technologies that underpin the designed world and major enterprises that produce the goods and services of the designed world. Core technologies include but are not limited to biotechnology, electrical, electronics, fluid, material, mechanical, optical, structural, and thermal technologies. Major enterprises include medical, agriculture, biotechnology, energy and power, information and communication, transportation, and manufacturing and construction technologies.**
INDICATOR / PROFICIENCY LEVEL		**Analyze the function of select core technologies in the designed world.**
OBJECTIVE		**Agricultural Technologies**
EXPECTATION		Design, develop, use, manage, maintain, and assess a closed system that supports living organisms (e.g. terrarium, hydroponics station).
STRAND / TOPIC / STANDARD		**Maryland Technology Education Standards: Grades 6-8**
TOPIC / INDICATOR		**Standard Four: Core Technologies and The Designed World – Students will demonstrate knowledge of the core technologies that underpin the designed world and major enterprises that produce the goods and services of the designed world. Core technologies include but are not limited to biotechnology, electrical, electronics, fluid, material, mechanical, optical, structural, and thermal technologies. Major enterprises include medical, agriculture, biotechnology, energy and power, information and communication, transportation, and manufacturing and construction technologies.**
INDICATOR / PROFICIENCY LEVEL		**Analyze the function of select core technologies in the designed world.**
OBJECTIVE		**Biotechnology**
EXPECTATION		Explore applications of biotechnology.
STRAND / TOPIC / STANDARD		**Maryland Technology Education Standards: Grades 6-8**

TOPIC / INDICATOR		**Standard Four: Core Technologies and The Designed World – Students will demonstrate knowledge of the core technologies that underpin the designed world and major enterprises that produce the goods and services of the designed world. Core technologies include but are not limited to biotechnology, electrical, electronics, fluid, material, mechanical, optical, structural, and thermal technologies. Major enterprises include medical, agriculture, biotechnology, energy and power, information and communication, transportation, and manufacturing and construction technologies.**
INDICATOR / PROFICIENCY LEVEL		**Analyze the function of select core technologies in the designed world.**
OBJECTIVE		**Energy and Power Technologies**
EXPECTATION		Design, construct, and test a device that either minimizes or maximizes energy transfer (MS-PS3-3).

STRAND / TOPIC / STANDARD		**Maryland Technology Education Standards: Grades 6-8**
TOPIC / INDICATOR		**Standard Five: Computational Thinking and Computer Science Applications – Students will be able to apply computational thinking skills and computer science applications as tools to develop solutions to engineering problems.**
INDICATOR / PROFICIENCY LEVEL		Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems.
INDICATOR / PROFICIENCY LEVEL		Use the basic steps in algorithmic problem solving to design solutions to problems.
INDICATOR / PROFICIENCY LEVEL		Implement problem solutions using a programming language.
INDICATOR / PROFICIENCY LEVEL		Analyze how computational thinking and computer programing can be used as tools for problem solving.

Maryland College and Career-Ready Standards

Technology Education

Grade **8** - Adopted: **2016**

STRAND / TOPIC / STANDARD		**Maryland Technology Education Standards: Grades 6-8**
TOPIC / INDICATOR		**Standard Three: Engineering Design and Development – Students will demonstrate knowledge of and apply the engineering design process to develop solutions to problems.**
INDICATOR / PROFICIENCY LEVEL		**Engineering design and development includes but is not limited to research and development, invention and innovation, problem solving, and using and maintaining technological products and systems.**
OBJECTIVE		**Explain how the design process is an iterative, systematic approach to problem solving that includes collaboratively:**
EXPECTATION		Defining a problem – students will be able to employ technical reading and writing skills to develop concise problem statement.
EXPECTATION		Selecting an Approach – students will be able to employ a decision matrix to select the best approach to solve the problem.

EXPECTATION		Testing and Evaluating Design Using Specifications – students will be able to use establish specifications to assess their design product.

STRAND / TOPIC / STANDARD		**Maryland Technology Education Standards: Grades 6-8**
TOPIC / INDICATOR		**Standard Three: Engineering Design and Development – Students will demonstrate knowledge of and apply the engineering design process to develop solutions to problems.**
INDICATOR / PROFICIENCY LEVEL		**Engineering design and development includes but is not limited to research and development, invention and innovation, problem solving, and using and maintaining technological products and systems.**

OBJECTIVE		Discriminate between ethical and unethical engineering practices.

STRAND / TOPIC / STANDARD		**Maryland Technology Education Standards: Grades 6-8**
TOPIC / INDICATOR		**Standard Four: Core Technologies and The Designed World – Students will demonstrate knowledge of the core technologies that underpin the designed world and major enterprises that produce the goods and services of the designed world. Core technologies include but are not limited to biotechnology, electrical, electronics, fluid, material, mechanical, optical, structural, and thermal technologies. Major enterprises include medical, agriculture, biotechnology, energy and power, information and communication, transportation, and manufacturing and construction technologies.**
INDICATOR / PROFICIENCY LEVEL		**Analyze the function of select core technologies in the designed world.**
OBJECTIVE		**Agricultural Technologies**

EXPECTATION		Design, develop, use, manage, maintain, and assess a closed system that supports living organisms (e.g. terrarium, hydroponics station).

STRAND / TOPIC / STANDARD		**Maryland Technology Education Standards: Grades 6-8**
TOPIC / INDICATOR		**Standard Four: Core Technologies and The Designed World – Students will demonstrate knowledge of the core technologies that underpin the designed world and major enterprises that produce the goods and services of the designed world. Core technologies include but are not limited to biotechnology, electrical, electronics, fluid, material, mechanical, optical, structural, and thermal technologies. Major enterprises include medical, agriculture, biotechnology, energy and power, information and communication, transportation, and manufacturing and construction technologies.**
INDICATOR / PROFICIENCY LEVEL		**Analyze the function of select core technologies in the designed world.**
OBJECTIVE		**Biotechnology**

EXPECTATION		Explore applications of biotechnology.

STRAND / TOPIC / STANDARD		**Maryland Technology Education Standards: Grades 6-8**
TOPIC / INDICATOR		**Standard Four: Core Technologies and The Designed World – Students will demonstrate knowledge of the core technologies that underpin the designed world and major enterprises that produce the goods and services of the designed world. Core technologies include but are not limited to biotechnology, electrical, electronics, fluid, material, mechanical, optical, structural, and thermal technologies. Major enterprises include medical, agriculture, biotechnology, energy and power, information and communication, transportation, and manufacturing and construction technologies.**
INDICATOR / PROFICIENCY LEVEL		**Analyze the function of select core technologies in the designed world.**

OBJECTIVE		Energy and Power Technologies
EXPECTATION		Design, construct, and test a device that either minimizes or maximizes energy transfer (MS-PS3-3).
STRAND / TOPIC / STANDARD		**Maryland Technology Education Standards: Grades 6-8**
TOPIC / INDICATOR		**Standard Five: Computational Thinking and Computer Science Applications – Students will be able to apply computational thinking skills and computer science applications as tools to develop solutions to engineering problems.**
INDICATOR / PROFICIENCY LEVEL		Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems.
INDICATOR / PROFICIENCY LEVEL		Use the basic steps in algorithmic problem solving to design solutions to problems.
INDICATOR / PROFICIENCY LEVEL		Implement problem solutions using a programming language.
INDICATOR / PROFICIENCY LEVEL		Analyze how computational thinking and computer programing can be used as tools for problem solving.

Massachusetts Curriculum Frameworks

Mathematics

Grade **5** - Adopted: **2017**

FOCUS / COURSE	MA.MP.	Mathematical Practice
STRAND	MP.1.	Make sense of problems and persevere in solving them.
STRAND	MP.2.	Reason abstractly and quantitatively.
STRAND	MP.3.	Construct viable arguments and critique the reasoning of others.
STRAND	MP.4.	Model with mathematics.
STRAND	MP.5.	Use appropriate tools strategically.
STRAND	MP.7.	Look for and make use of structure.
FOCUS / COURSE	**MA.5.MD.**	**Measurement and Data**
STRAND	**5.MD.C.**	**Geometric measurement: Understand concepts of volume and relate volume to multiplication and to addition.**
STANDARD / CONCEPT / SKILL	5.MD.C.4.	Measure volumes by counting unit cubes, using cubic cm, cubic in., cubic ft., and non-standard units.

FOCUS / COURSE	**MA.5.MD.**	**Measurement and Data**
STRAND	**5.MD.C.**	**Geometric measurement: Understand concepts of volume and relate volume to multiplication and to addition.**
STANDARD / CONCEPT / SKILL	**5.MD.C.5.**	**Relate volume to the operations of multiplication and addition and solve real-world and mathematical problems involving volume.**
INDICATOR	5.MD.C.5.a.	Find the volume of a right rectangular prism with whole-number edge lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
INDICATOR	5.MD.C.5.b.	Apply the formula V = l x w x h and V = B x h (where B stands for the area of the base) for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real-world and mathematical problems.

Massachusetts Curriculum Frameworks

Mathematics

Grade **6** - Adopted: **2017**

FOCUS / COURSE	**MA.MP.**	**Mathematical Practice**
STRAND	MP.1.	Make sense of problems and persevere in solving them.
STRAND	MP.2.	Reason abstractly and quantitatively.
STRAND	MP.3.	Construct viable arguments and critique the reasoning of others.
STRAND	MP.4.	Model with mathematics.
STRAND	MP.5.	Use appropriate tools strategically.
STRAND	MP.7.	Look for and make use of structure.
FOCUS / COURSE	**MA.6.G.**	**Geometry**
STRAND	**6.G.A.**	**Solve real-world and mathematical problems involving area, surface area, and volume.**
STANDARD / CONCEPT / SKILL	6.G.A.2.	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = lwh and V = bh to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

Massachusetts Curriculum Frameworks

Mathematics

Grade **7** - Adopted: **2017**

FOCUS / COURSE	**MA.MP.**	**Mathematical Practice**
STRAND	MP.1.	Make sense of problems and persevere in solving them.

STRAND	MP.2.	Reason abstractly and quantitatively.
STRAND	MP.3.	Construct viable arguments and critique the reasoning of others.
STRAND	MP.4.	Model with mathematics.
STRAND	MP.5.	Use appropriate tools strategically.
STRAND	MP.7.	Look for and make use of structure.

Massachusetts Curriculum Frameworks

Mathematics

Grade **8** - Adopted: **2017**

FOCUS / COURSE	MA.MP.	Mathematical Practice
STRAND	MP.1.	Make sense of problems and persevere in solving them.
STRAND	MP.2.	Reason abstractly and quantitatively.
STRAND	MP.3.	Construct viable arguments and critique the reasoning of others.
STRAND	MP.4.	Model with mathematics.
STRAND	MP.5.	Use appropriate tools strategically.
STRAND	MP.7.	Look for and make use of structure.
FOCUS / COURSE	**MA.8.G.**	**Geometry**
STRAND	**8.G.C.**	**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.**
STANDARD / CONCEPT / SKILL	8.G.C.9.	Know the formulas for the volumes of cones, cylinders, and spheres, and use them to solve real-world and mathematical problems.

Massachusetts Curriculum Frameworks

Science

Grade **5** - Adopted: **2016**

FOCUS / COURSE	MA.5-ETS.	Grade 5: Technology/Engineering
STRAND	**ETS3.**	**Technological Systems**
STANDARD / CONCEPT / SKILL	5.3-5-ETS3-1(MA).	Use informational text to provide examples of improvements to existing technologies (innovations) and the development of new technologies (inventions). Recognize that technology is any modification of the natural or designed world done to fulfill human needs or wants.

Massachusetts Curriculum Frameworks

Science

Grade **6** - Adopted: **2016**

FOCUS / COURSE	MA.6-ETS.	Grade 6: Technology/Engineering
STRAND	**ETS1.**	**Engineering Design**
STANDARD / CONCEPT / SKILL	6.MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution. Include potential impacts on people and the natural environment that may limit possible solutions.
STANDARD / CONCEPT / SKILL	6.MS-ETS1-6(MA).	Communicate a design solution to an intended user, including design features and limitations of the solution.

FOCUS / COURSE	MA.6-ETS.	Grade 6: Technology/Engineering
STRAND	**ETS2.**	**Materials, Tools, and Manufacturing**
STANDARD / CONCEPT / SKILL	6.MS-ETS2-2(MA).	Given a design task, select appropriate materials based on specific properties needed in the construction of a solution.
STANDARD / CONCEPT / SKILL	6.MS-ETS2-3(MA).	Choose and safely use appropriate measuring tools, hand tools, fasteners, and common hand-held power tools used to construct a prototype.

Grade **6** - Adopted: **2010**

FOCUS / COURSE	MA.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
STRAND		**Key Ideas and Details**
STANDARD / CONCEPT / SKILL	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
STANDARD / CONCEPT / SKILL	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

FOCUS / COURSE	MA.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
STRAND		**Craft and Structure**
STANDARD / CONCEPT / SKILL	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
STANDARD / CONCEPT / SKILL	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

FOCUS / COURSE	MA.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
STRAND		**Integration of Knowledge and Ideas**

STANDARD / CONCEPT / SKILL	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

FOCUS / COURSE	**MA.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STRAND		**Range of Reading and Level of Text Complexity**
STANDARD / CONCEPT / SKILL	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

FOCUS / COURSE	**MA.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND		**Text Types and Purposes**
STANDARD / CONCEPT / SKILL	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
INDICATOR	WHST.6-8.2(d)	Use precise language and domain-specific vocabulary to inform about or explain the topic.

FOCUS / COURSE	**MA.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND		**Production and Distribution of Writing**
STANDARD / CONCEPT / SKILL	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
STANDARD / CONCEPT / SKILL	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Massachusetts Curriculum Frameworks

Science

Grade **7** - Adopted: **2016**

FOCUS / COURSE	**MA.7-ETS.**	**Grade 7: Technology/Engineering**
STRAND	**ETS1.**	**Engineering Design**
STANDARD / CONCEPT / SKILL	7.MS-ETS1-2.	Evaluate competing solutions to a given design problem using a decision matrix to determine how well each meets the criteria and constraints of the problem. Use a model of each solution to evaluate how variations in one or more design features, including size, shape, weight, or cost, may affect the function or effectiveness of the solution.
STANDARD / CONCEPT / SKILL	7.MS-ETS1-4.	Generate and analyze data from iterative testing and modification of a proposed object, tool, or process to optimize the object, tool, or process for its intended purpose.
STANDARD / CONCEPT / SKILL	7.MS-ETS1-7(MA).	Construct a prototype of a solution to a given design problem.

Grade **7** - Adopted: **2010**

FOCUS / COURSE	MA.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
STRAND		Key Ideas and Details
STANDARD / CONCEPT / SKILL	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
STANDARD / CONCEPT / SKILL	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

FOCUS / COURSE	MA.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
STRAND		Craft and Structure
STANDARD / CONCEPT / SKILL	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
STANDARD / CONCEPT / SKILL	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

FOCUS / COURSE	MA.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
STRAND		Integration of Knowledge and Ideas
STANDARD / CONCEPT / SKILL	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

FOCUS / COURSE	MA.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
STRAND		Range of Reading and Level of Text Complexity
STANDARD / CONCEPT / SKILL	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

FOCUS / COURSE	MA.WHST.6-8.	Writing Standards for Literacy in Science and Technical Subjects
STRAND		Text Types and Purposes
STANDARD / CONCEPT / SKILL	WHST.6-8.2.	Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
INDICATOR	WHST.6-8.2(d)	Use precise language and domain-specific vocabulary to inform about or explain the topic.

FOCUS / COURSE	MA.WHST.6-8.	Writing Standards for Literacy in Science and Technical Subjects
STRAND		Production and Distribution of Writing

STANDARD / CONCEPT / SKILL	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
STANDARD / CONCEPT / SKILL	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Massachusetts Curriculum Frameworks

Science

Grade **8** - Adopted: **2010**

FOCUS / COURSE	MA.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
STRAND		**Key Ideas and Details**
STANDARD / CONCEPT / SKILL	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
STANDARD / CONCEPT / SKILL	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

FOCUS / COURSE	MA.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
STRAND		**Craft and Structure**
STANDARD / CONCEPT / SKILL	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
STANDARD / CONCEPT / SKILL	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

FOCUS / COURSE	MA.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
STRAND		**Integration of Knowledge and Ideas**
STANDARD / CONCEPT / SKILL	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

FOCUS / COURSE	MA.RST.6-8.	Reading Standards for Literacy in Science and Technical Subjects
STRAND		**Range of Reading and Level of Text Complexity**
STANDARD / CONCEPT / SKILL	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

FOCUS / COURSE	MA.WHST.6-8.	Writing Standards for Literacy in Science and Technical Subjects

STRAND		**Text Types and Purposes**
STANDARD / CONCEPT / SKILL	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
INDICATOR	WHST.6-8.2(d)	Use precise language and domain-specific vocabulary to inform about or explain the topic.

FOCUS / COURSE	**MA.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
STRAND		**Production and Distribution of Writing**
STANDARD / CONCEPT / SKILL	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
STANDARD / CONCEPT / SKILL	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Massachusetts Curriculum Frameworks

Technology Education

Grade **5** - Adopted: **2016**

FOCUS / COURSE	**MA.3-5.CT.**	**Grades 3 – 5: Computational Thinking (CT)**
STRAND	**3-5.CT.a.**	**Abstraction**
STANDARD / CONCEPT / SKILL	3-5.CT.a.3.	Make a list of sub-problems to consider, while addressing a larger problem.

FOCUS / COURSE	**MA.3-5.CT.**	**Grades 3 – 5: Computational Thinking (CT)**
STRAND	**3-5.CT.b.**	**Algorithms**
STANDARD / CONCEPT / SKILL	3-5.CT.b.1.	Define an algorithm as a sequence of instructions that can be processed by a computer.
STANDARD / CONCEPT / SKILL	3-5.CT.b.4.	Individually and collaboratively create an algorithm to solve a problem (e.g., move a character/robot/person through a maze).

FOCUS / COURSE	**MA.3-5.CT.**	**Grades 3 – 5: Computational Thinking (CT)**
STRAND	**3-5.CT.d.**	**Programming and Development**
STANDARD / CONCEPT / SKILL	3-5.CT.d.1.	Individually and collaboratively create, test, and modify a program in a graphical environment (e.g., block-based visual programming language).

Grade **6** - Adopted: **2016**

FOCUS / COURSE	**MA.6-8.CAS.**	**Grades 6 – 8: Computing and Society (CAS)**
STRAND	**6-8.CAS.c.**	**Interpersonal and Societal Impact**
STANDARD / CONCEPT / SKILL	6-8.CAS.c.2.	Identify and discuss the technology proficiencies needed in the classroom and the workplace, and how to meet the needs.

FOCUS / COURSE	**MA.6-8.CT.**	**Grades 6 – 8: Computational Thinking (CT)**
STRAND	**6-8.CT.b.**	**Algorithms**
STANDARD / CONCEPT / SKILL	6-8.CT.b.3.	Individually and collaboratively decompose a problem and create a sub-solution for each of its parts (e.g., video game, robot obstacle course, making dinner).

FOCUS / COURSE	**MA.6-8.CT.**	**Grades 6 – 8: Computational Thinking (CT)**
STRAND	**6-8.CT.d.**	**Programming and Development**
STANDARD / CONCEPT / SKILL	6-8.CT.d.2.	Use functions to hide the detail in a program.
STANDARD / CONCEPT / SKILL	6-8.CT.d.3.	Create a program, individually and collaboratively, that implements an algorithm to achieve a given goal.
STANDARD / CONCEPT / SKILL	6-8.CT.d.5.	Trace programs step-by-step in order to predict their behavior.

Massachusetts Curriculum Frameworks

Technology Education

Grade **7** - Adopted: **2016**

FOCUS / COURSE	**MA.6-8.CAS.**	**Grades 6 – 8: Computing and Society (CAS)**
STRAND	**6-8.CAS.c.**	**Interpersonal and Societal Impact**
STANDARD / CONCEPT / SKILL	6-8.CAS.c.2.	Identify and discuss the technology proficiencies needed in the classroom and the workplace, and how to meet the needs.

FOCUS / COURSE	**MA.6-8.CT.**	**Grades 6 – 8: Computational Thinking (CT)**
STRAND	**6-8.CT.b.**	**Algorithms**

STANDARD / CONCEPT / SKILL	6-8.CT.b.3.	Individually and collaboratively decompose a problem and create a sub-solution for each of its parts (e.g., video game, robot obstacle course, making dinner).

FOCUS / COURSE	**MA.6-8.CT.**	**Grades 6 – 8: Computational Thinking (CT)**
STRAND	**6-8.CT.d.**	**Programming and Development**
STANDARD / CONCEPT / SKILL	6-8.CT.d.2.	Use functions to hide the detail in a program.
STANDARD / CONCEPT / SKILL	6-8.CT.d.3.	Create a program, individually and collaboratively, that implements an algorithm to achieve a given goal.
STANDARD / CONCEPT / SKILL	6-8.CT.d.5.	Trace programs step-by-step in order to predict their behavior.

Massachusetts Curriculum Frameworks

Technology Education

Grade **8** - Adopted: **2016**

FOCUS / COURSE	**MA.6-8.CAS.**	**Grades 6 – 8: Computing and Society (CAS)**
STRAND	**6-8.CAS.c.**	**Interpersonal and Societal Impact**
STANDARD / CONCEPT / SKILL	6-8.CAS.c.2.	Identify and discuss the technology proficiencies needed in the classroom and the workplace, and how to meet the needs.

FOCUS / COURSE	**MA.6-8.CT.**	**Grades 6 – 8: Computational Thinking (CT)**
STRAND	**6-8.CT.b.**	**Algorithms**
STANDARD / CONCEPT / SKILL	6-8.CT.b.3.	Individually and collaboratively decompose a problem and create a sub-solution for each of its parts (e.g., video game, robot obstacle course, making dinner).

FOCUS / COURSE	**MA.6-8.CT.**	**Grades 6 – 8: Computational Thinking (CT)**
STRAND	**6-8.CT.d.**	**Programming and Development**
STANDARD / CONCEPT / SKILL	6-8.CT.d.2.	Use functions to hide the detail in a program.
STANDARD / CONCEPT / SKILL	6-8.CT.d.3.	Create a program, individually and collaboratively, that implements an algorithm to achieve a given goal.

STANDARD / CONCEPT / SKILL	6-8.CT.d.5.	Trace programs step-by-step in order to predict their behavior.

Mathematics

Mathematics

Grade **Key Stage 2** - Adopted: **2012**

AREA OF LEARNING	**NIR.1.**	**Mathematics and Numeracy**
STRAND	**1.1.**	**Processes in Mathematics**
SUBSTRAND / ESSENTIAL KNOWLEDGE	**1.1.1.**	**Making and Monitoring Decisions**
STANDARD		**Pupils should be enabled to:**
INDICATOR	1.1.1.1.	Take increasing responsibility for selecting and using the materials and the mathematics required for their work.
INDICATOR	1.1.1.3.	Plan and organise their work, learning to work systematically.
INDICATOR	1.1.1.4.	Develop a range of strategies for problem solving, looking for ways to overcome difficulties.

AREA OF LEARNING	**NIR.1.**	**Mathematics and Numeracy**
STRAND	**1.1.**	**Processes in Mathematics**
SUBSTRAND / ESSENTIAL KNOWLEDGE	**1.1.3.**	**Mathematical Reasoning**
STANDARD		**Pupils should be enabled to:**
INDICATOR	1.1.3.1.	Recognise general patterns and relationships and make predictions about them.

AREA OF LEARNING	**NIR.1.**	**Mathematics and Numeracy**
STRAND	**1.3.**	**Measures**
SUBSTRAND / ESSENTIAL KNOWLEDGE		**Pupils should be enabled to:**
STANDARD	1.3.1.	Develop skills in estimation of length, ‘weight’, volume/capacity, time, area and temperature.

Mathematics

Mathematics

Grade **Key Stage 3** - Adopted: **2012**

AREA OF LEARNING	**NIR.1.**	**Mathematics and Numeracy: Mathematics with Financial Capability**
STRAND	**1.5.**	**Learning Outcomes: The Learning Outcomes require the demonstration of skills and application of knowledge and understanding of Mathematics.**
SUBSTRAND / ESSENTIAL KNOWLEDGE		**Pupils should be able to:**

STANDARD	1.5.5.	Show deeper mathematical understanding by thinking critically and flexibly, solving problems and making informed decisions, using ICT where appropriate.

Michigan Academic Standards

Mathematics

Grade **5** - Adopted: **2010**

STRAND / STANDARD CATEGORY	MI.CC.MP.5.	Mathematical Practices
STANDARD	MP.5.1.	Make sense of problems and persevere in solving them.
STANDARD	MP.5.2.	Reason abstractly and quantitatively.
STANDARD	MP.5.3.	Construct viable arguments and critique the reasoning of others.
STANDARD	MP.5.4.	Model with mathematics.
STANDARD	MP.5.5.	Use appropriate tools strategically.
STANDARD	MP.5.7.	Look for and make use of structure.

STRAND / STANDARD CATEGORY	MI.CC.MD.5.	Measurement and Data
STANDARD		**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
GRADE LEVEL EXPECTATION	MD.5.4.	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

STRAND / STANDARD CATEGORY	MI.CC.MD.5.	Measurement and Data
STANDARD		**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
GRADE LEVEL EXPECTATION	**MD.5.5.**	**Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.**
EXPECTATION	MD.5.5(a)	Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
EXPECTATION	MD.5.5(b)	Apply the formulas V = l x w x h and V = b x h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.

Michigan Academic Standards

Mathematics

Grade **6** - Adopted: **2010**

STRAND / STANDARD CATEGORY	MI.CC.MP.6.	Mathematical Practices

STANDARD	MP.6.1.	Make sense of problems and persevere in solving them.
STANDARD	MP.6.2.	Reason abstractly and quantitatively.
STANDARD	MP.6.3.	Construct viable arguments and critique the reasoning of others.
STANDARD	MP.6.4.	Model with mathematics.
STANDARD	MP.6.5.	Use appropriate tools strategically.
STANDARD	MP.6.7.	Look for and make use of structure.
STRAND / STANDARD CATEGORY	**MI.CC.G.6.**	**Geometry**
STANDARD		**Solve real-world and mathematical problems involving area, surface area, and volume.**
GRADE LEVEL EXPECTATION	G.6.2.	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

Michigan Academic Standards

Mathematics

Grade **7** - Adopted: **2010**

STRAND / STANDARD CATEGORY	**MI.CC.MP.7.**	**Mathematical Practices**
STANDARD	MP.7.1.	Make sense of problems and persevere in solving them.
STANDARD	MP.7.2.	Reason abstractly and quantitatively.
STANDARD	MP.7.3.	Construct viable arguments and critique the reasoning of others.
STANDARD	MP.7.4.	Model with mathematics.
STANDARD	MP.7.5.	Use appropriate tools strategically.
STANDARD	MP.7.7.	Look for and make use of structure.

Michigan Academic Standards

Mathematics

Grade **8** - Adopted: **2010**

STRAND / STANDARD CATEGORY	**MI.CC.MP.8.**	**Mathematical Practices**
STANDARD	MP.8.1.	Make sense of problems and persevere in solving them.

STANDARD	MP.8.2.	Reason abstractly and quantitatively.
STANDARD	MP.8.3.	Construct viable arguments and critique the reasoning of others.
STANDARD	MP.8.4.	Model with mathematics.
STANDARD	MP.8.5.	Use appropriate tools strategically.
STANDARD	MP.8.7.	Look for and make use of structure.
STRAND / STANDARD CATEGORY	**MI.CC.G.8.**	**Geometry**
STANDARD		**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.**
GRADE LEVEL EXPECTATION	G.8.9.	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Michigan Academic Standards

Science

Grade **5** - Adopted: **2015**

STRAND / STANDARD CATEGORY	**MI.SC.5.**	**Engineering Design**
STANDARD	3-5-ETS1-1.	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
STANDARD	3-5-ETS1-2.	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
STANDARD	3-5-ETS1-3.	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Michigan Academic Standards

Science

Grade **6** - Adopted: **2015**

STRAND / STANDARD CATEGORY	**MI.SC.5.**	**Waves and Electromagnetic Radiation**
STANDARD	MS-PS4-3.	Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.
STRAND / STANDARD CATEGORY	**MI.SC.17.**	**Human Impacts**
STANDARD	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
STRAND / STANDARD CATEGORY	**MI.SC.18.**	**Engineering Design**

STANDARD	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
STANDARD	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
STANDARD	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **6** - Adopted: **2010**

STRAND / STANDARD CATEGORY	**MI.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STANDARD		**Key Ideas and Details**
GRADE LEVEL EXPECTATION	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
GRADE LEVEL EXPECTATION	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
STRAND / STANDARD CATEGORY	**MI.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STANDARD		**Craft and Structure**
GRADE LEVEL EXPECTATION	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
GRADE LEVEL EXPECTATION	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
STRAND / STANDARD CATEGORY	**MI.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STANDARD		**Integration of Knowledge and Ideas**
GRADE LEVEL EXPECTATION	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
STRAND / STANDARD CATEGORY	**MI.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STANDARD		**Range of Reading and Level of Text Complexity**
GRADE LEVEL EXPECTATION	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.
STRAND / STANDARD CATEGORY	**MI.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
STANDARD		**Text Types and Purposes**

GRADE LEVEL EXPECTATION	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
EXPECTATION	WHST.6-8.2(d)	Use precise language and domain-specific vocabulary to inform about or explain the topic.
STRAND / STANDARD CATEGORY	**MI.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
STANDARD		**Production and Distribution of Writing**
GRADE LEVEL EXPECTATION	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
GRADE LEVEL EXPECTATION	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Michigan Academic Standards

Science

Grade **7** - Adopted: **2015**

STRAND / STANDARD CATEGORY	**MI.SC.5.**	**Waves and Electromagnetic Radiation**
STANDARD	MS-PS4-3.	Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.
STRAND / STANDARD CATEGORY	**MI.SC.17.**	**Human Impacts**
STANDARD	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
STRAND / STANDARD CATEGORY	**MI.SC.18.**	**Engineering Design**
STANDARD	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
STANDARD	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
STANDARD	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **7** - Adopted: **2010**

STRAND / STANDARD CATEGORY	**MI.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STANDARD		**Key Ideas and Details**
GRADE LEVEL EXPECTATION	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

GRADE LEVEL EXPECTATION	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
STRAND / STANDARD CATEGORY	**MI.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STANDARD		**Craft and Structure**
GRADE LEVEL EXPECTATION	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
GRADE LEVEL EXPECTATION	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
STRAND / STANDARD CATEGORY	**MI.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STANDARD		**Integration of Knowledge and Ideas**
GRADE LEVEL EXPECTATION	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
STRAND / STANDARD CATEGORY	**MI.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STANDARD		**Range of Reading and Level of Text Complexity**
GRADE LEVEL EXPECTATION	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.
STRAND / STANDARD CATEGORY	**MI.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
STANDARD		**Text Types and Purposes**
GRADE LEVEL EXPECTATION	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
EXPECTATION	WHST.6-8.2(d)	Use precise language and domain-specific vocabulary to inform about or explain the topic.
STRAND / STANDARD CATEGORY	**MI.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
STANDARD		**Production and Distribution of Writing**
GRADE LEVEL EXPECTATION	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
GRADE LEVEL EXPECTATION	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

STRAND / STANDARD CATEGORY	**MI.SC.5.**	**Waves and Electromagnetic Radiation**
STANDARD	MS-PS4-3.	Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.
STRAND / STANDARD CATEGORY	**MI.SC.17.**	**Human Impacts**
STANDARD	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
STRAND / STANDARD CATEGORY	**MI.SC.18.**	**Engineering Design**
STANDARD	MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
STANDARD	MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
STANDARD	MS-ETS1-4.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **8** - Adopted: **2010**

STRAND / STANDARD CATEGORY	**MI.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STANDARD		**Key Ideas and Details**
GRADE LEVEL EXPECTATION	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
GRADE LEVEL EXPECTATION	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
STRAND / STANDARD CATEGORY	**MI.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STANDARD		**Craft and Structure**
GRADE LEVEL EXPECTATION	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
GRADE LEVEL EXPECTATION	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
STRAND / STANDARD CATEGORY	**MI.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STANDARD		**Integration of Knowledge and Ideas**

GRADE LEVEL EXPECTATION	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

STRAND / STANDARD CATEGORY	**MI.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
STANDARD		**Range of Reading and Level of Text Complexity**

GRADE LEVEL EXPECTATION	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

STRAND / STANDARD CATEGORY	**MI.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
STANDARD		**Text Types and Purposes**
GRADE LEVEL EXPECTATION	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**

EXPECTATION	WHST.6-8.2(d)	Use precise language and domain-specific vocabulary to inform about or explain the topic.

STRAND / STANDARD CATEGORY	**MI.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
STANDARD		**Production and Distribution of Writing**

GRADE LEVEL EXPECTATION	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

GRADE LEVEL EXPECTATION	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Michigan Academic Standards

Technology Education

Grade **5** - Adopted: **2017**

STRAND / STANDARD CATEGORY	**MI.MITECS.**	**Michigan Integrated Technology Competencies for Students**
STANDARD	**MITECS.3.**	**Knowledge Constructor - Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.**

GRADE LEVEL EXPECTATION	MITECS.3.d.	Build knowledge by actively exploring realworld issues and problems, developing ideas and theories, and pursuing answers and solutions.

STRAND / STANDARD CATEGORY	**MI.MITECS.**	**Michigan Integrated Technology Competencies for Students**
STANDARD	**MITECS.4.**	**Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.**

GRADE LEVEL EXPECTATION	MITECS.4.b.	Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

GRADE LEVEL EXPECTATION	MITECS.4.c.	Develop, test, and refine prototypes as part of a cyclical design process.
GRADE LEVEL EXPECTATION	MITECS.4.d.	Exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems.
STRAND / STANDARD CATEGORY	**MI.MITECS.**	**Michigan Integrated Technology Competencies for Students**
STANDARD	**MITECS.5.**	**Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.**
GRADE LEVEL EXPECTATION	MITECS.5.a.	Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
GRADE LEVEL EXPECTATION	MITECS.5.d.	Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Grade **5** - Adopted: **2019**

STRAND / STANDARD CATEGORY		**Michigan Computer Science Standards**
STANDARD		**LEVEL 1B: UPPER ELEMENTARY (GRADES 3-5)**
GRADE LEVEL EXPECTATION		**ALGORITHMS AND PROGRAMMING**
EXPECTATION	1B-AP-11.	Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process. Subconcept: Modularity; Practice 3.2
EXPECTATION	1B-AP-13.	Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences. Subconcept: Program Development; Practice 1.1, 5.1
EXPECTATION	1B-AP-16.	Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development. Subconcept: Program Development; Practice 2.2
EXPECTATION	1B-AP-17.	Describe choices made during program development using code comments, presentations, and demonstrations. Subconcept: Program Development; Practice 7.2

Michigan Academic Standards

Technology Education

Grade **6** - Adopted: **2017**

STRAND / STANDARD CATEGORY	**MI.MITECS.**	**Michigan Integrated Technology Competencies for Students**
STANDARD	**MITECS.3.**	**Knowledge Constructor - Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.**
GRADE LEVEL EXPECTATION	MITECS.3.d.	Build knowledge by actively exploring realworld issues and problems, developing ideas and theories, and pursuing answers and solutions.
STRAND / STANDARD CATEGORY	**MI.MITECS.**	**Michigan Integrated Technology Competencies for Students**

STANDARD	**MITECS .4.**	**Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.**
GRADE LEVEL EXPECTATION	MITECS. 4.b.	Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
GRADE LEVEL EXPECTATION	MITECS. 4.c.	Develop, test, and refine prototypes as part of a cyclical design process.
GRADE LEVEL EXPECTATION	MITECS. 4.d.	Exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems.
STRAND / STANDARD CATEGORY	**MI.MITECS.**	**Michigan Integrated Technology Competencies for Students**
STANDARD	**MITECS .5.**	**Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.**
GRADE LEVEL EXPECTATION	MITECS. 5.a.	Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
GRADE LEVEL EXPECTATION	MITECS. 5.d.	Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Grade **6** - Adopted: **2019**

STRAND / STANDARD CATEGORY		**Michigan Computer Science Standards**
STANDARD		**LEVEL 2: MIDDLE SCHOOL (GRADES 6-8)**
GRADE LEVEL EXPECTATION		**ALGORITHMS AND PROGRAMMING**
EXPECTATION	2-AP-10.	Use flowcharts and/or pseudocode to address complex problems as algorithms. Subconcept: Algorithms; Practice 4.4, 4.1

Michigan Academic Standards

Technology Education

Grade **7** - Adopted: **2017**

STRAND / STANDARD CATEGORY	**MI.MITECS.**	**Michigan Integrated Technology Competencies for Students**
STANDARD	**MITECS .3.**	**Knowledge Constructor - Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.**
GRADE LEVEL EXPECTATION	MITECS. 3.d.	Build knowledge by actively exploring realworld issues and problems, developing ideas and theories, and pursuing answers and solutions.
STRAND / STANDARD CATEGORY	**MI.MITECS.**	**Michigan Integrated Technology Competencies for Students**
STANDARD	**MITECS .4.**	**Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.**
GRADE LEVEL EXPECTATION	MITECS. 4.b.	Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

GRADE LEVEL EXPECTATION	MITECS.4.c.	Develop, test, and refine prototypes as part of a cyclical design process.
GRADE LEVEL EXPECTATION	MITECS.4.d.	Exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems.

STRAND / STANDARD CATEGORY	MI.MITECS.	Michigan Integrated Technology Competencies for Students
STANDARD	**MITECS.5.**	**Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.**
GRADE LEVEL EXPECTATION	MITECS.5.a.	Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
GRADE LEVEL EXPECTATION	MITECS.5.d.	Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Grade **7** - Adopted: **2019**

STRAND / STANDARD CATEGORY		Michigan Computer Science Standards
STANDARD		**LEVEL 2: MIDDLE SCHOOL (GRADES 6-8)**
GRADE LEVEL EXPECTATION		**ALGORITHMS AND PROGRAMMING**
EXPECTATION	2-AP-10.	Use flowcharts and/or pseudocode to address complex problems as algorithms. Subconcept: Algorithms; Practice 4.4, 4.1

Michigan Academic Standards

Technology Education

Grade **8** - Adopted: **2017**

STRAND / STANDARD CATEGORY	MI.MITECS.	Michigan Integrated Technology Competencies for Students
STANDARD	**MITECS.3.**	**Knowledge Constructor - Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.**
GRADE LEVEL EXPECTATION	MITECS.3.d.	Build knowledge by actively exploring realworld issues and problems, developing ideas and theories, and pursuing answers and solutions.

STRAND / STANDARD CATEGORY	MI.MITECS.	Michigan Integrated Technology Competencies for Students
STANDARD	**MITECS.4.**	**Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.**
GRADE LEVEL EXPECTATION	MITECS.4.b.	Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
GRADE LEVEL EXPECTATION	MITECS.4.c.	Develop, test, and refine prototypes as part of a cyclical design process.

GRADE LEVEL EXPECTATION	MITECS.4.d.	Exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems.

STRAND / STANDARD CATEGORY	**MI.MITECS.**	**Michigan Integrated Technology Competencies for Students**
STANDARD	**MITECS.5.**	**Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.**
GRADE LEVEL EXPECTATION	MITECS.5.a.	Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
GRADE LEVEL EXPECTATION	MITECS.5.d.	Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Grade **8** - Adopted: **2019**

STRAND / STANDARD CATEGORY		**Michigan Computer Science Standards**
STANDARD		**LEVEL 2: MIDDLE SCHOOL (GRADES 6-8)**
GRADE LEVEL EXPECTATION		**ALGORITHMS AND PROGRAMMING**
EXPECTATION	2-AP-10.	Use flowcharts and/or pseudocode to address complex problems as algorithms. Subconcept: Algorithms; Practice 4.4, 4.1

Minnesota Academic Standards

Mathematics

Grade **5** - Adopted: **2008**

CONTENT STANDARD / DOMAIN	**MN.5.3.**	**Geometry & Measurement**
PERFORMANCE INDICATOR / DOMAIN COMPONENT	**5.3.2.**	**Determine the area of triangles and quadrilaterals; determine the surface area and volume of rectangular prisms in various contexts.**
INDICATORS OF PROGRESS / STRAND	5.3.2.2.	Use various tools and strategies to measure the volume and surface area of objects that are shaped like rectangular prisms.
INDICATORS OF PROGRESS / STRAND	5.3.2.4.	Develop and use the formulas V = lwh and V = Bh to determine the volume of rectangular prisms. Justify why base area B and height h are multiplied to find the volume of a rectangular prism by breaking the prism into layers of unit cubes.

Minnesota Academic Standards

Mathematics

Grade **6** - Adopted: **2008**

CONTENT STANDARD / DOMAIN	**MN.6.3.**	**Geometry & Measurement**
PERFORMANCE INDICATOR / DOMAIN COMPONENT	**6.3.1.**	**Calculate perimeter, area, surface area and volume of two and three dimensional figures to solve real-world and mathematical problems.**

INDICATORS OF PROGRESS / STRAND	6.3.1.1.	Calculate the surface area and volume of prisms and use appropriate units, such as cm2 and cm3. Justify the formulas used. Justification may involve decomposition, nets or other models.

CONTENT STANDARD / DOMAIN	**MN.6.3.**	**Geometry & Measurement**
PERFORMANCE INDICATOR / DOMAIN COMPONENT	**6.3.3.**	**Choose appropriate units of measurement and use ratios to convert within measurement systems to solve real-world and mathematical problems.**
INDICATORS OF PROGRESS / STRAND	6.3.3.2.	Estimate weights, capacities and geometric measurements using benchmarks in measurement systems with appropriate units.

Minnesota Academic Standards

Mathematics

Grade **7** - Adopted: **2008**

CONTENT STANDARD / DOMAIN	**MN.7.3.**	**Geometry & Measurement**
PERFORMANCE INDICATOR / DOMAIN COMPONENT	**7.3.1.**	**Use reasoning with proportions and ratios to determine measurements, justify formulas and solve real world and mathematical problems involving circles and related geometric figures.**
INDICATORS OF PROGRESS / STRAND	7.3.1.2.	Calculate the volume and surface area of cylinders and justify the formulas used.

Minnesota Academic Standards

Science

Grade **5** - Adopted: **2009**

CONTENT STANDARD / DOMAIN	**MN.5.1.**	**The Nature of Science and Engineering**
PERFORMANCE INDICATOR / DOMAIN COMPONENT	**5.1.3.**	**Interactions Among Science, Technology, Engineering, Mathematics, and Society**
INDICATORS OF PROGRESS / STRAND	**5.1.3.2.**	**The student will understand that men and women throughout the history of all cultures, including Minnesota American Indian tribes and communities, have been involved in engineering design and scientific inquiry.**
INDICATORS OF PROGRESS	5.1.3.2.1.	Describe how science and engineering influence and are influenced by local traditions and beliefs.

CONTENT STANDARD / DOMAIN	**MN.5.1.**	**The Nature of Science and Engineering**
PERFORMANCE INDICATOR / DOMAIN COMPONENT	**5.1.3.**	**Interactions Among Science, Technology, Engineering, Mathematics, and Society**
INDICATORS OF PROGRESS / STRAND	**5.1.3.4.**	**The student will understand that tools and mathematics help scientists and engineers see more, measure more accurately, and do things that they could not otherwise accomplish.**

INDICATORS OF PROGRESS	5.1.3.4.1.	Use appropriate tools and techniques in gathering, analyzing and interpreting data.

Minnesota Academic Standards

Science

Grade **6** - Adopted: **2009**

CONTENT STANDARD / DOMAIN	**MN.6.1.**	**The Nature of Science and Engineering**
PERFORMANCE INDICATOR / DOMAIN COMPONENT	**6.1.2.**	**The Practice of Engineering**
INDICATORS OF PROGRESS / STRAND	**6.1.2.1.**	**The student will understand that engineers create, develop and manufacture machines, structures, processes and systems that impact society and may make humans more productive.**
INDICATORS OF PROGRESS	6.1.2.1.2.	Recognize that there is no perfect design and that new technologies have consequences that may increase some risks and decrease others.
INDICATORS OF PROGRESS	6.1.2.1.4.	Explain the importance of learning from past failures, in order to inform future designs of similar products or systems.

CONTENT STANDARD / DOMAIN	**MN.6.1.**	**The Nature of Science and Engineering**
PERFORMANCE INDICATOR / DOMAIN COMPONENT	**6.1.2.**	**The Practice of Engineering**
INDICATORS OF PROGRESS / STRAND	**6.1.2.2.**	**The student will understand that engineering design is the process of devising products, processes and systems that address a need, capitalize on an opportunity, or solve a specific problem.**
INDICATORS OF PROGRESS	6.1.2.2.1.	Apply and document an engineering design process that includes identifying criteria and constraints, making representations, testing and evaluation, and refining the design as needed to construct a product or system that solves a problem.

Grade **6** - Adopted: **2010**

CONTENT STANDARD / DOMAIN	**MN.6.13.**	**Reading Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Key Ideas and Details**
INDICATORS OF PROGRESS / STRAND	6.13.2.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
INDICATORS OF PROGRESS / STRAND	6.13.3.3.	Follow precisely a multistep procedure when carrying out experiments, designing solutions, taking measurements, or performing technical tasks.

CONTENT STANDARD / DOMAIN	**MN.6.13.**	**Reading Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Craft and Structure**
INDICATORS OF PROGRESS / STRAND	6.13.4.4.	Determine the meaning of symbols, equations, graphical representations, tabular representations, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
INDICATORS OF PROGRESS / STRAND	6.13.5.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
INDICATORS OF PROGRESS / STRAND	6.13.6.6.	Analyze the author's purpose in describing phenomena, providing an explanation, describing a procedure, or discussing/reporting an experiment in a text.

CONTENT STANDARD / DOMAIN	**MN.6.13.**	**Reading Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Integration of Knowledge and Ideas**
INDICATORS OF PROGRESS / STRAND	6.13.9.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

CONTENT STANDARD / DOMAIN	**MN.6.13.**	**Reading Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Range of Reading and Level of Text Complexity**
INDICATORS OF PROGRESS / STRAND	6.13.10.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

CONTENT STANDARD / DOMAIN	**MN.6.14.**	**Writing Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Text Types and Purposes**
INDICATORS OF PROGRESS / STRAND	**6.14.2.2.**	**Write informative/explanatory texts, as they apply to each discipline and reporting format, including the narration of historical events, of scientific procedures/ experiments, or description of technical processes.**
INDICATORS OF PROGRESS	6.14.2.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic.

CONTENT STANDARD / DOMAIN	**MN.6.14.**	**Writing Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Production and Distribution of Writing**
INDICATORS OF PROGRESS / STRAND	6.14.4.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Minnesota Academic Standards

Science

Grade **7** - Adopted: **2009**

CONTENT STANDARD / DOMAIN	**MN.7.4.**	**Life Science**
PERFORMANCE INDICATOR / DOMAIN COMPONENT	**7.4.4.**	**Human Interactions with Living Systems**
INDICATORS OF PROGRESS / STRAND	**7.4.4.2.**	**The student will understand that human beings are constantly interacting with other organisms that cause disease.**
INDICATORS OF PROGRESS	7.4.4.2.1.	Explain how viruses, bacteria, fungi and parasites may infect the human body and interfere with normal body functions.
INDICATORS OF PROGRESS	7.4.4.2.2.	Recognize that a microorganism can cause specific diseases and that there are a variety of medicines available that can be used to combat a given microorganism.

Grade **7** - Adopted: **2010**

CONTENT STANDARD / DOMAIN	**MN.6.13.**	**Reading Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Key Ideas and Details**
INDICATORS OF PROGRESS / STRAND	6.13.2.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
INDICATORS OF PROGRESS / STRAND	6.13.3.3.	Follow precisely a multistep procedure when carrying out experiments, designing solutions, taking measurements, or performing technical tasks.
CONTENT STANDARD / DOMAIN	**MN.6.13.**	**Reading Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Craft and Structure**

INDICATORS OF PROGRESS / STRAND	6.13.4.4.	Determine the meaning of symbols, equations, graphical representations, tabular representations, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
INDICATORS OF PROGRESS / STRAND	6.13.5.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
INDICATORS OF PROGRESS / STRAND	6.13.6.6.	Analyze the author's purpose in describing phenomena, providing an explanation, describing a procedure, or discussing/reporting an experiment in a text.
CONTENT STANDARD / DOMAIN	**MN.6.13.**	**Reading Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Integration of Knowledge and Ideas**
INDICATORS OF PROGRESS / STRAND	6.13.9.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
CONTENT STANDARD / DOMAIN	**MN.6.13.**	**Reading Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Range of Reading and Level of Text Complexity**
INDICATORS OF PROGRESS / STRAND	6.13.10.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.
CONTENT STANDARD / DOMAIN	**MN.6.14.**	**Writing Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Text Types and Purposes**
INDICATORS OF PROGRESS / STRAND	**6.14.2.2.**	**Write informative/explanatory texts, as they apply to each discipline and reporting format, including the narration of historical events, of scientific procedures/ experiments, or description of technical processes.**
INDICATORS OF PROGRESS	6.14.2.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic.
CONTENT STANDARD / DOMAIN	**MN.6.14.**	**Writing Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Production and Distribution of Writing**

INDICATORS OF PROGRESS / STRAND	6.14.4.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Minnesota Academic Standards

Science

Grade **8** - Adopted: **2009**

CONTENT STANDARD / DOMAIN	**MN.8.1.**	**The Nature of Science and Engineering**
PERFORMANCE INDICATOR / DOMAIN COMPONENT	**8.1.3.**	**Interactions Among Science, Technology, Engineering, Mathematics, and Society**
INDICATORS OF PROGRESS / STRAND	**8.1.3.3.**	**The student will understand that science and engineering operate in the context of society and both influence and are influenced by this context.**
INDICATORS OF PROGRESS	8.1.3.3.2.	Understand that scientific knowledge is always changing as new technologies and information enhance observations and analysis of data.
INDICATORS OF PROGRESS	8.1.3.3.3.	Provide examples of how advances in technology have impacted the ways in which people live, work and interact.

CONTENT STANDARD / DOMAIN	**MN.8.3.**	**Earth and Space Science**
PERFORMANCE INDICATOR / DOMAIN COMPONENT	**8.3.4.**	**Human Interactions with Earth Systems**
INDICATORS OF PROGRESS / STRAND	**8.3.4.1.**	**The student will understand that in order to maintain and improve their existence, humans interact with and influence Earth systems.**
INDICATORS OF PROGRESS	8.3.4.1.2.	Recognize that land and water use practices in specific areas affect natural processes and that natural processes interfere and interact with human systems.

Grade **8** - Adopted: **2010**

CONTENT STANDARD / DOMAIN	**MN.6.13.**	**Reading Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Key Ideas and Details**
INDICATORS OF PROGRESS / STRAND	6.13.2.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
INDICATORS OF PROGRESS / STRAND	6.13.3.3.	Follow precisely a multistep procedure when carrying out experiments, designing solutions, taking measurements, or performing technical tasks.

CONTENT STANDARD / DOMAIN	**MN.6.13.**	**Reading Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Craft and Structure**
INDICATORS OF PROGRESS / STRAND	6.13.4.4.	Determine the meaning of symbols, equations, graphical representations, tabular representations, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
INDICATORS OF PROGRESS / STRAND	6.13.5.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
INDICATORS OF PROGRESS / STRAND	6.13.6.6.	Analyze the author's purpose in describing phenomena, providing an explanation, describing a procedure, or discussing/reporting an experiment in a text.

CONTENT STANDARD / DOMAIN	**MN.6.13.**	**Reading Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Integration of Knowledge and Ideas**
INDICATORS OF PROGRESS / STRAND	6.13.9.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

CONTENT STANDARD / DOMAIN	**MN.6.13.**	**Reading Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Range of Reading and Level of Text Complexity**
INDICATORS OF PROGRESS / STRAND	6.13.10.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

CONTENT STANDARD / DOMAIN	**MN.6.14.**	**Writing Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Text Types and Purposes**
INDICATORS OF PROGRESS / STRAND	**6.14.2.2.**	**Write informative/explanatory texts, as they apply to each discipline and reporting format, including the narration of historical events, of scientific procedures/ experiments, or description of technical processes.**
INDICATORS OF PROGRESS	6.14.2.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic.

CONTENT STANDARD / DOMAIN	**MN.6.14.**	**Writing Benchmarks: Literacy in Science and Technical Subjects 6-12**
PERFORMANCE INDICATOR / DOMAIN COMPONENT		**Production and Distribution of Writing**
INDICATORS OF PROGRESS / STRAND	6.14.4.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Minnesota Academic Standards

Technology Education

Grade **5** - Adopted: **2009**

CONTENT STANDARD / DOMAIN	**MN.ITL.3-5.**	**Information and Technology Literacy Standards (Refresh 2009)**
PERFORMANCE INDICATOR / DOMAIN COMPONENT	**3-5.3.**	**Technology Use and Concepts: explore multiple technologies, evaluate their suitability for the desired educational or personal task, and apply the tools needed.**
INDICATORS OF PROGRESS / STRAND	**3-5.3.I.**	**Use of Technology**
INDICATORS OF PROGRESS	**3-5.3.I.D.**	**Strategically solve information and technology issues.**
INDICATOR	3-5.3.I.D.1.	Seek assistance to trouble shoot technical problems.

Minnesota Academic Standards

Technology Education

Grade **6** - Adopted: **2009**

CONTENT STANDARD / DOMAIN	**MN.ITL.6-8.**	**Information and Technology Literacy Standards (Refresh 2009)**
PERFORMANCE INDICATOR / DOMAIN COMPONENT	**6-8.3.**	**Technology Use and Concepts: Students will explore multiple technologies, evaluate their suitability for the desired educational or personal task, and apply the tools needed.**
INDICATORS OF PROGRESS / STRAND	**6-8.3.I.**	**Use of Technology**
INDICATORS OF PROGRESS	**6-8.3.I.D.**	**Strategically solve information and technology issues.**
INDICATOR	6-8.3.I.D.1.	Independently troubleshoot technology issues, following organizational policies.
INDICATOR	6-8.3.I.D.2.	Locate assistance independently or through the help of others as needed.

Minnesota Academic Standards

Technology Education

Grade **7** - Adopted: **2009**

CONTENT STANDARD / DOMAIN	**MN.ITL.6-8.**	**Information and Technology Literacy Standards (Refresh 2009)**
PERFORMANCE INDICATOR / DOMAIN COMPONENT	**6-8.3.**	**Technology Use and Concepts: Students will explore multiple technologies, evaluate their suitability for the desired educational or personal task, and apply the tools needed.**
INDICATORS OF PROGRESS / STRAND	**6-8.3.I.**	**Use of Technology**
INDICATORS OF PROGRESS	**6-8.3.I.D.**	**Strategically solve information and technology issues.**
INDICATOR	6-8.3.I.D.1.	Independently troubleshoot technology issues, following organizational policies.
INDICATOR	6-8.3.I.D.2.	Locate assistance independently or through the help of others as needed.

Minnesota Academic Standards

Technology Education

Grade **8** - Adopted: **2009**

CONTENT STANDARD / DOMAIN	**MN.ITL.6-8.**	**Information and Technology Literacy Standards (Refresh 2009)**
PERFORMANCE INDICATOR / DOMAIN COMPONENT	**6-8.3.**	**Technology Use and Concepts: Students will explore multiple technologies, evaluate their suitability for the desired educational or personal task, and apply the tools needed.**
INDICATORS OF PROGRESS / STRAND	**6-8.3.I.**	**Use of Technology**
INDICATORS OF PROGRESS	**6-8.3.I.D.**	**Strategically solve information and technology issues.**
INDICATOR	6-8.3.I.D.1.	Independently troubleshoot technology issues, following organizational policies.
INDICATOR	6-8.3.I.D.2.	Locate assistance independently or through the help of others as needed.

Mississippi College & Career Readiness Standards

Mathematics

Grade **5** - Adopted: **2016**

THEME	**MS.MP.**	**Standards for Mathematical Practice**
SUBJECT	MP.1.	Make sense of problems and persevere in solving them.
SUBJECT	MP.2.	Reason abstractly and quantitatively.
SUBJECT	MP.3.	Construct viable arguments and critique the reasoning of others.
SUBJECT	MP.4.	Model with mathematics.

SUBJECT	MP.5.	Use appropriate tools strategically.
SUBJECT	MP.7.	Look for and make use of structure.
THEME	**MS.5.MD.**	**Measurement and Data (MD)**
SUBJECT		**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition**
STANDARD	5.MD.4.	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.
THEME	**MS.5.MD.**	**Measurement and Data (MD)**
SUBJECT		**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition**
STANDARD	**5.MD.5.**	**Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.**
OBJECTIVE	5.MD.5.a.	Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
OBJECTIVE	5.MD.5.b.	Apply the formulas V = l × w × h and V = b × h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.

Mississippi College & Career Readiness Standards

Mathematics

Grade **6** - Adopted: **2016**

THEME	**MS.MP.**	**Standards for Mathematical Practice**
SUBJECT	MP.1.	Make sense of problems and persevere in solving them.
SUBJECT	MP.2.	Reason abstractly and quantitatively.
SUBJECT	MP.3.	Construct viable arguments and critique the reasoning of others.
SUBJECT	MP.4.	Model with mathematics.
SUBJECT	MP.5.	Use appropriate tools strategically.
SUBJECT	MP.7.	Look for and make use of structure.
THEME	**MS.6.G.**	**Geometry (G)**
SUBJECT		**Solve real-world and mathematical problems involving area, surface area, and volume**
STANDARD	6.G.2.	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = lwh and V = bh to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

Mathematics

Grade **7** - Adopted: **2016**

THEME	MS.MP.	Standards for Mathematical Practice
SUBJECT	MP.1.	Make sense of problems and persevere in solving them.
SUBJECT	MP.2.	Reason abstractly and quantitatively.
SUBJECT	MP.3.	Construct viable arguments and critique the reasoning of others.
SUBJECT	MP.4.	Model with mathematics.
SUBJECT	MP.5.	Use appropriate tools strategically.
SUBJECT	MP.7.	Look for and make use of structure.

THEME	MS.CM7.	Compacted Mathematics Grade 7
SUBJECT	**CM7.G.**	**Geometry**
STANDARD		**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres**
OBJECTIVE	8.G.9.	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Mississippi College & Career Readiness Standards

Mathematics

Grade **8** - Adopted: **2016**

THEME	MS.MP.	Standards for Mathematical Practice
SUBJECT	MP.1.	Make sense of problems and persevere in solving them.
SUBJECT	MP.2.	Reason abstractly and quantitatively.
SUBJECT	MP.3.	Construct viable arguments and critique the reasoning of others.
SUBJECT	MP.4.	Model with mathematics.
SUBJECT	MP.5.	Use appropriate tools strategically.
SUBJECT	MP.7.	Look for and make use of structure.

THEME	MS.8.	Grade 8
SUBJECT	**8.G.**	**Geometry (G)**
STANDARD		**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres**
OBJECTIVE	8.G.9.	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Science

Grade **6** - Adopted: **2018**

THEME	**MS.L.6.**	**GRADE SIX: Life Science**
SUBJECT		**Ecology and Interdependence**
STANDARD	**L.6.3.**	**Students will demonstrate an understanding of the relationships among survival, environmental changes, and diversity as they relate to the interactions of organisms, populations, and the environment.**
OBJECTIVE	L.6.3.1.	Use scientific reasoning to explain differences between biotic and abiotic factors that demonstrate what living organisms need to survive.

THEME	**MS.L.6.**	**GRADE SIX: Life Science**
SUBJECT		**Adaptation and Diversity**
STANDARD	**L.6.4.**	**Students will demonstrate an understanding of classification tools and models such as dichotomous keys to classify representative organisms based on the characteristics of the kingdoms: Archaebacteria, Eubacteria, Protists, Fungi, Plants, and Animals.**
OBJECTIVE	L.6.4.5.	Engage in scientific arguments to support claims that bacteria (Archaebacteria and Eubacteria) and viruses can be both helpful and harmful to other organisms and the environment.

Mississippi College & Career Readiness Standards

Science

Grade **7** - Adopted: **2018**

THEME	**MS.L.7.**	**GRADE SEVEN: Life Science**
SUBJECT		**Ecology and Interdependence**
STANDARD	**L.7.3.**	**Students will demonstrate an understanding of the importance that matter cycles between living and nonliving parts of the ecosystem to sustain life on Earth.**
OBJECTIVE	L.7.3.4.	Explain how disruptions in cycles (e.g., water, oxygen, carbon, and nitrogen) affect biodiversity and ecosystem services (e.g., water, food, and medications) which are needed to sustain human life on Earth.

Mississippi College & Career Readiness Standards

Technology Education

Grade **6** - Adopted: **2018**

THEME		**Mississippi College- and Career-Readiness Standards for Computer Science**
SUBJECT		**Level 2: GRADES 6-8 - Algorithms and Programming**
STANDARD	**AP.2.**	**Algorithms and Programming (AP.2)**
OBJECTIVE	**AP.2.1.**	**Use flowcharts and/or pseudocode to address complex problems as algorithms. [ALGORITHMS] (P4.4, P4.1)**
OBJECTIVE	AP.2.1a.	Students will use pseudocode and/or flowcharts to organize and sequence an algorithm that addresses a complex problem, even though they may not actually program the solutions.

Mississippi College & Career Readiness Standards

Technology Education

Grade **7** - Adopted: **2018**

THEME		**Mississippi College- and Career-Readiness Standards for Computer Science**
SUBJECT		**Level 2: GRADES 6-8 - Algorithms and Programming**
STANDARD	**AP.2.**	**Algorithms and Programming (AP.2)**

OBJECTIVE	**AP.2.1.**	**Use flowcharts and/or pseudocode to address complex problems as algorithms. [ALGORITHMS] (P4.4, P4.1)**
OBJECTIVE	AP.2.1a.	Students will use pseudocode and/or flowcharts to organize and sequence an algorithm that addresses a complex problem, even though they may not actually program the solutions.

Mississippi College & Career Readiness Standards

Technology Education

Grade **8** - Adopted: **2018**

THEME		**Mississippi College- and Career-Readiness Standards for Computer Science**
SUBJECT		**Level 2: GRADES 6-8 - Algorithms and Programming**
STANDARD	**AP.2.**	**Algorithms and Programming (AP.2)**
OBJECTIVE	**AP.2.1.**	**Use flowcharts and/or pseudocode to address complex problems as algorithms. [ALGORITHMS] (P4.4, P4.1)**
OBJECTIVE	AP.2.1a.	Students will use pseudocode and/or flowcharts to organize and sequence an algorithm that addresses a complex problem, even though they may not actually program the solutions.

Missouri Learning Standards

Mathematics

Grade **5** - Adopted: **2016**

STRAND: BIG IDEA / STANDARD	**MO.5.GM.**	**Geometry and Measurement**
CONCEPT: GLE / BENCHMARK	**5.GM.B.**	**Understand and compute volume.**
GLE / COMPONENT	5.GM.B.5.	Apply the formulas V = l × w × h and V = B × h for volume of right rectangular prisms with whole-number edge lengths.

Missouri Learning Standards

Mathematics

Grade **6** - Adopted: **2016**

STRAND: BIG IDEA / STANDARD	**MO.6.GM.**	**Geometry and Measurement**
CONCEPT: GLE / BENCHMARK	**6.GM.A.**	**Solve problems involving area, surface area and volume.**
GLE / COMPONENT	**6.GM.A.2.**	**Find the volume of right rectangular prisms.**
INDICATOR / PROFICIENCY	6.GM.A.2b.	Apply V = l * w * h and V = Bh to find the volume of right rectangular prisms.

Missouri Learning Standards

Mathematics

Grade **7** - Adopted: **2016**

STRAND: BIG IDEA / STANDARD	**MO.7.GM.**	**Geometry and Measurement**
CONCEPT: GLE / BENCHMARK	**7.GM.B.**	**Apply and extend previous understanding of angle measure, area and volume.**

GLE / COMPONENT	**7.GM.B.6.**	**Understand the relationship between area, surface area and volume.**
INDICATOR / PROFICIENCY	7.GM.B.6 b.	Find the volume and surface area of prisms, pyramids and cylinders.

Missouri Learning Standards

Science

Grade **5** - Adopted: **2016**

STRAND: BIG IDEA / STANDARD	**MO.5.ETS1.**	**Engineering Design**
CONCEPT: GLE / BENCHMARK	**5.ETS1.A.**	**Defining and Delimiting Engineering Problems**
GLE / COMPONENT	5.ETS1.A.1.	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

STRAND: BIG IDEA / STANDARD	**MO.5.ETS1.**	**Engineering Design**
CONCEPT: GLE / BENCHMARK	**5.ETS1.B.**	**Developing Possible Solutions**
GLE / COMPONENT	5.ETS1.B.1.	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

STRAND: BIG IDEA / STANDARD	**MO.5.ETS1.**	**Engineering Design**
CONCEPT: GLE / BENCHMARK	**5.ETS1.C.**	**Optimizing the Solution Process**
GLE / COMPONENT	5.ETS1.C.1.	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Missouri Learning Standards

Science

Grade **6** - Adopted: **2016**

STRAND: BIG IDEA / STANDARD	**MO.6-8.ESS.**	**Earth and Space Sciences**
CONCEPT: GLE / BENCHMARK	**6-8.ESS3.**	**Earth and Human Activity**
GLE / COMPONENT	**6-8.ESS3.C.**	**Human Impacts on Earth's Systems**
INDICATOR / PROFICIENCY	6-8.ESS3.C.1.	Analyze data to define the relationship for how increases in human population and per-capita consumption of natural resources impact Earth's systems. [Clarification Statement: Examples of data include grade-appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts can include changes to the appearance, composition, and structure of Earth's systems as well as the rates at which they change.]

STRAND: BIG IDEA / STANDARD	**MO.6-8.ETS.**	**Engineering, Technology, and Application of Science**
CONCEPT: GLE / BENCHMARK	**6-8.ETS1.**	**Engineering Design**
GLE / COMPONENT	**6-8.ETS1.A.**	**Defining and Delimiting Engineering Problems**
INDICATOR / PROFICIENCY	6-8.ETS1.A.1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

STRAND: BIG IDEA / STANDARD	**MO.6-8.ETS.**	**Engineering, Technology, and Application of Science**
CONCEPT: GLE / BENCHMARK	**6-8.ETS1.**	**Engineering Design**
GLE / COMPONENT	**6-8.ETS1.B.**	**Developing Possible Solutions**
INDICATOR / PROFICIENCY	6-8.ETS1.B.1.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
INDICATOR / PROFICIENCY	6-8.ETS1.B.3.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **6** - Adopted: **2010**

STRAND: BIG IDEA / STANDARD	**MO.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Key Ideas and Details**
GLE / COMPONENT	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
GLE / COMPONENT	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

STRAND: BIG IDEA / STANDARD	**MO.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Craft and Structure**
GLE / COMPONENT	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.

GLE / COMPONENT	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
STRAND: BIG IDEA / STANDARD	**MO.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Integration of Knowledge and Ideas**
GLE / COMPONENT	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
STRAND: BIG IDEA / STANDARD	**MO.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Range of Reading and Level of Text Complexity**
GLE / COMPONENT	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.
STRAND: BIG IDEA / STANDARD	**MO.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Text Types and Purposes**
GLE / COMPONENT	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
INDICATOR / PROFICIENCY	WHST.6-8.2(d)	Use precise language and domain-specific vocabulary to inform about or explain the topic.
STRAND: BIG IDEA / STANDARD	**MO.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Production and Distribution of Writing**
GLE / COMPONENT	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
GLE / COMPONENT	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Missouri Learning Standards

Science

Grade **7** - Adopted: **2016**

STRAND: BIG IDEA / STANDARD	**MO.6-8.ESS.**	**Earth and Space Sciences**
CONCEPT: GLE / BENCHMARK	**6-8.ESS3.**	**Earth and Human Activity**

GLE / COMPONENT	**6-8.ESS3.C.**	**Human Impacts on Earth's Systems**
INDICATOR / PROFICIENCY	6-8.ESS3.C.1.	Analyze data to define the relationship for how increases in human population and per-capita consumption of natural resources impact Earth's systems. [Clarification Statement: Examples of data include grade-appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts can include changes to the appearance, composition, and structure of Earth's systems as well as the rates at which they change.]
STRAND: BIG IDEA / STANDARD	**MO.6-8.ETS.**	**Engineering, Technology, and Application of Science**
CONCEPT: GLE / BENCHMARK	**6-8.ETS1.**	**Engineering Design**
GLE / COMPONENT	**6-8.ETS1.A.**	**Defining and Delimiting Engineering Problems**
INDICATOR / PROFICIENCY	6-8.ETS1.A.1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
STRAND: BIG IDEA / STANDARD	**MO.6-8.ETS.**	**Engineering, Technology, and Application of Science**
CONCEPT: GLE / BENCHMARK	**6-8.ETS1.**	**Engineering Design**
GLE / COMPONENT	**6-8.ETS1.B.**	**Developing Possible Solutions**
INDICATOR / PROFICIENCY	6-8.ETS1.B.1.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
INDICATOR / PROFICIENCY	6-8.ETS1.B.3.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **7** - Adopted: **2010**

STRAND: BIG IDEA / STANDARD	**MO.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Key Ideas and Details**
GLE / COMPONENT	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
GLE / COMPONENT	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
STRAND: BIG IDEA / STANDARD	**MO.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**

CONCEPT: GLE / BENCHMARK		**Craft and Structure**
GLE / COMPONENT	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
GLE / COMPONENT	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
STRAND: BIG IDEA / STANDARD	**MO.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Integration of Knowledge and Ideas**
GLE / COMPONENT	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
STRAND: BIG IDEA / STANDARD	**MO.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Range of Reading and Level of Text Complexity**
GLE / COMPONENT	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.
STRAND: BIG IDEA / STANDARD	**MO.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Text Types and Purposes**
GLE / COMPONENT	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
INDICATOR / PROFICIENCY	WHST.6-8.2(d)	Use precise language and domain-specific vocabulary to inform about or explain the topic.
STRAND: BIG IDEA / STANDARD	**MO.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Production and Distribution of Writing**
GLE / COMPONENT	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
GLE / COMPONENT	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

STRAND: BIG IDEA / STANDARD	**MO.6-8.ESS.**	**Earth and Space Sciences**
CONCEPT: GLE / BENCHMARK	**6-8.ESS3.**	**Earth and Human Activity**
GLE / COMPONENT	**6-8.ESS3.C.**	**Human Impacts on Earth's Systems**
INDICATOR / PROFICIENCY	6-8.ESS3.C.1.	Analyze data to define the relationship for how increases in human population and per-capita consumption of natural resources impact Earth's systems. [Clarification Statement: Examples of data include grade-appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts can include changes to the appearance, composition, and structure of Earth's systems as well as the rates at which they change.]

STRAND: BIG IDEA / STANDARD	**MO.6-8.ETS.**	**Engineering, Technology, and Application of Science**
CONCEPT: GLE / BENCHMARK	**6-8.ETS1.**	**Engineering Design**
GLE / COMPONENT	**6-8.ETS1.A.**	**Defining and Delimiting Engineering Problems**
INDICATOR / PROFICIENCY	6-8.ETS1.A.1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

STRAND: BIG IDEA / STANDARD	**MO.6-8.ETS.**	**Engineering, Technology, and Application of Science**
CONCEPT: GLE / BENCHMARK	**6-8.ETS1.**	**Engineering Design**
GLE / COMPONENT	**6-8.ETS1.B.**	**Developing Possible Solutions**
INDICATOR / PROFICIENCY	6-8.ETS1.B.1.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
INDICATOR / PROFICIENCY	6-8.ETS1.B.3.	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Grade **8** - Adopted: **2010**

STRAND: BIG IDEA / STANDARD	**MO.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Key Ideas and Details**
GLE / COMPONENT	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

GLE / COMPONENT	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
STRAND: BIG IDEA / STANDARD	**MO.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Craft and Structure**
GLE / COMPONENT	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
GLE / COMPONENT	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
STRAND: BIG IDEA / STANDARD	**MO.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Integration of Knowledge and Ideas**
GLE / COMPONENT	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
STRAND: BIG IDEA / STANDARD	**MO.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Range of Reading and Level of Text Complexity**
GLE / COMPONENT	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.
STRAND: BIG IDEA / STANDARD	**MO.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Text Types and Purposes**
GLE / COMPONENT	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
INDICATOR / PROFICIENCY	WHST.6-8.2(d)	Use precise language and domain-specific vocabulary to inform about or explain the topic.
STRAND: BIG IDEA / STANDARD	**MO.WHST.6-8.**	**Writing Standards for Literacy in Science and Technical Subjects**
CONCEPT: GLE / BENCHMARK		**Production and Distribution of Writing**
GLE / COMPONENT	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

GLE / COMPONENT	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Missouri Learning Standards

Technology Education

Grade **5** - Adopted: **2019**

STRAND: BIG IDEA / STANDARD		**Computer Science Performance Standards**
CONCEPT: GLE / BENCHMARK		**Computing Systems**
GLE / COMPONENT		**Troubleshooting**
INDICATOR / PROFICIENCY	5.CS.T.01.	Identify, using accurate terminology, simple hardware and software problems that may occur during everyday use. Discuss problems with peers and adults, apply strategies for solving these problems and explain why the strategy should work.

STRAND: BIG IDEA / STANDARD		**Computer Science Performance Standards**
CONCEPT: GLE / BENCHMARK		**Algorithms & Programming**
GLE / COMPONENT		**Algorithms**
INDICATOR / PROFICIENCY	5.AP.A.01.	Compare and simplify multiple algorithms (sets of step-by-step instructions) for accomplishing the same task verbally and kinesthetically, with robot devices or a programming language, then determine which is the most efficient.

STRAND: BIG IDEA / STANDARD		**Computer Science Performance Standards**
CONCEPT: GLE / BENCHMARK		**Algorithms & Programming**
GLE / COMPONENT		**Control**
INDICATOR / PROFICIENCY	5.AP.C.01.	Create a program using control structures (e.g., sequence, conditionals, interactive-looping), event handlers and variables to solve a problem or express ideas both independently and collaboratively.

Missouri Learning Standards

Technology Education

Grade **6** - Adopted: **2019**

STRAND: BIG IDEA / STANDARD		**Computer Science Performance Standards**
CONCEPT: GLE / BENCHMARK		**Algorithms & Programming**
GLE / COMPONENT		**Algorithms**

INDICATOR / PROFICIENCY	6-8.AP.A.01.	Design algorithms with flow charts and/or pseudocode to show solutions to complex problems.

Missouri Learning Standards

Technology Education

Grade **7** - Adopted: **2019**

STRAND: BIG IDEA / STANDARD		Computer Science Performance Standards
CONCEPT: GLE / BENCHMARK		Algorithms & Programming
GLE / COMPONENT		Algorithms
INDICATOR / PROFICIENCY	6-8.AP.A.01.	Design algorithms with flow charts and/or pseudocode to show solutions to complex problems.

Missouri Learning Standards

Technology Education

Grade **8** - Adopted: **2019**

STRAND: BIG IDEA / STANDARD		Computer Science Performance Standards
CONCEPT: GLE / BENCHMARK		Algorithms & Programming
GLE / COMPONENT		Algorithms
INDICATOR / PROFICIENCY	6-8.AP.A.01.	Design algorithms with flow charts and/or pseudocode to show solutions to complex problems.

Montana Content Standards

Mathematics

Grade **5** - Adopted: **2011**

CONTENT STANDARD / DOMAIN	MT.CC.MP.	Mathematical Practices
BENCHMARK / STANDARD	MP.1.	Make sense of problems and persevere in solving them.
BENCHMARK / STANDARD	MP.2.	Reason abstractly and quantitatively.
BENCHMARK / STANDARD	MP.3.	Construct viable arguments and critique the reasoning of others.
BENCHMARK / STANDARD	MP.4.	Model with mathematics.
BENCHMARK / STANDARD	MP.5.	Use appropriate tools strategically.

BENCHMARK / STANDARD	MP.7.	Look for and make use of structure.

CONTENT STANDARD / DOMAIN	**MT.CC.5.MD.**	**Measurement and Data**
BENCHMARK / STANDARD		**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
GRADE LEVEL EXPECTATION / BENCHMARK	5.MD.4.	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

CONTENT STANDARD / DOMAIN	**MT.CC.5.MD.**	**Measurement and Data**
BENCHMARK / STANDARD		**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**
GRADE LEVEL EXPECTATION / BENCHMARK	**5.MD.5.**	**Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume within cultural contexts, including those of Montana American Indians.**
EXPECTATION	5.MD.5.a.	Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
EXPECTATION	5.MD.5.b.	Apply the formulas V = l x w x h and V = b x h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.

Montana Content Standards

Mathematics

Grade **6** - Adopted: **2011**

CONTENT STANDARD / DOMAIN	**MT.CC.MP.**	**Mathematical Practices**
BENCHMARK / STANDARD	MP.1.	Make sense of problems and persevere in solving them.
BENCHMARK / STANDARD	MP.2.	Reason abstractly and quantitatively.
BENCHMARK / STANDARD	MP.3.	Construct viable arguments and critique the reasoning of others.
BENCHMARK / STANDARD	MP.4.	Model with mathematics.
BENCHMARK / STANDARD	MP.5.	Use appropriate tools strategically.
BENCHMARK / STANDARD	MP.7.	Look for and make use of structure.

CONTENT STANDARD / DOMAIN	MT.CC.6.G.	Geometry
BENCHMARK / STANDARD		**Solve real-world and mathematical problems involving area, surface area, and volume.**
GRADE LEVEL EXPECTATION / BENCHMARK	6.G.2.	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

Montana Content Standards

Mathematics

Grade **7** - Adopted: **2011**

CONTENT STANDARD / DOMAIN	MT.CC.MP.	Mathematical Practices
BENCHMARK / STANDARD	MP.1.	Make sense of problems and persevere in solving them.
BENCHMARK / STANDARD	MP.2.	Reason abstractly and quantitatively.
BENCHMARK / STANDARD	MP.3.	Construct viable arguments and critique the reasoning of others.
BENCHMARK / STANDARD	MP.4.	Model with mathematics.
BENCHMARK / STANDARD	MP.5.	Use appropriate tools strategically.
BENCHMARK / STANDARD	MP.7.	Look for and make use of structure.

Montana Content Standards

Mathematics

Grade **8** - Adopted: **2011**

CONTENT STANDARD / DOMAIN	MT.CC.MP.	Mathematical Practices
BENCHMARK / STANDARD	MP.1.	Make sense of problems and persevere in solving them.
BENCHMARK / STANDARD	MP.2.	Reason abstractly and quantitatively.
BENCHMARK / STANDARD	MP.3.	Construct viable arguments and critique the reasoning of others.
BENCHMARK / STANDARD	MP.4.	Model with mathematics.

BENCHMARK / STANDARD	MP.5.	Use appropriate tools strategically.
BENCHMARK / STANDARD	MP.7.	Look for and make use of structure.
CONTENT STANDARD / DOMAIN	**MT.CC.8.G.**	**Geometry**
BENCHMARK / STANDARD		**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.**
GRADE LEVEL EXPECTATION / BENCHMARK	8.G.9.	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Montana Content Standards

Science

Grade **6** - Adopted: **2016**

CONTENT STANDARD / DOMAIN	**MT.6-8.ESS.**	**EARTH AND SPACE SCIENCE content standards for sixth through eighth grades are that students will:**
BENCHMARK / STANDARD	6-8.ESS.15.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems including indigenous populations

Grade **6** - Adopted: **2011**

CONTENT STANDARD / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Key Ideas and Details**
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
CONTENT STANDARD / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Craft and Structure**
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

CONTENT STANDARD / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Integration of Knowledge and Ideas**
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

CONTENT STANDARD / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Range of Reading Level of Text Complexity**
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

CONTENT STANDARD / DOMAIN	**MT.WHST.6-8.**	**Writing Standards for Literacy in Science, and Technical Subjects**
BENCHMARK / STANDARD		**Text Types and Purposes**
GRADE LEVEL EXPECTATION / BENCHMARK	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
EXPECTATION	WHST.6-8.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic.

CONTENT STANDARD / DOMAIN	**MT.WHST.6-8.**	**Writing Standards for Literacy in Science, and Technical Subjects**
BENCHMARK / STANDARD		**Production and Distribution of Writing**
GRADE LEVEL EXPECTATION / BENCHMARK	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
GRADE LEVEL EXPECTATION / BENCHMARK	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Montana Content Standards

Science

Grade **7** - Adopted: **2016**

CONTENT STANDARD / DOMAIN	**MT.6-8.ESS.**	**EARTH AND SPACE SCIENCE content standards for sixth through eighth grades are that students will:**
BENCHMARK / STANDARD	6-8.ESS.15.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems including indigenous populations

Grade **7** - Adopted: **2011**

CONTENT STANDARD / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Key Ideas and Details**
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

CONTENT STANDARD / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Craft and Structure**
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

CONTENT STANDARD / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Integration of Knowledge and Ideas**
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

CONTENT STANDARD / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Range of Reading Level of Text Complexity**
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

CONTENT STANDARD / DOMAIN	**MT.WHST.6-8.**	**Writing Standards for Literacy in Science, and Technical Subjects**
BENCHMARK / STANDARD		**Text Types and Purposes**
GRADE LEVEL EXPECTATION / BENCHMARK	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**

EXPECTATION	WHST.6-8.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic.

CONTENT STANDARD / DOMAIN	**MT.WHST.6-8.**	**Writing Standards for Literacy in Science, and Technical Subjects**
BENCHMARK / STANDARD		**Production and Distribution of Writing**
GRADE LEVEL EXPECTATION / BENCHMARK	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
GRADE LEVEL EXPECTATION / BENCHMARK	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Montana Content Standards

Science

Grade **8** - Adopted: **2016**

CONTENT STANDARD / DOMAIN	**MT.6-8.ESS.**	**EARTH AND SPACE SCIENCE content standards for sixth through eighth grades are that students will:**
BENCHMARK / STANDARD	6-8.ESS.15.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems including indigenous populations

Grade **8** - Adopted: **2011**

CONTENT STANDARD / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Key Ideas and Details**
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.2.	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

CONTENT STANDARD / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Craft and Structure**
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.4.	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.5.	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

CONTENT STANDARD / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Integration of Knowledge and Ideas**
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.9.	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

CONTENT STANDARD / DOMAIN	**MT.RST.6-8.**	**Reading Standards for Literacy in Science and Technical Subjects**
BENCHMARK / STANDARD		**Range of Reading Level of Text Complexity**
GRADE LEVEL EXPECTATION / BENCHMARK	RST.6-8.10.	By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

CONTENT STANDARD / DOMAIN	**MT.WHST.6-8.**	**Writing Standards for Literacy in Science, and Technical Subjects**
BENCHMARK / STANDARD		**Text Types and Purposes**
GRADE LEVEL EXPECTATION / BENCHMARK	**WHST.6-8.2.**	**Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**
EXPECTATION	WHST.6-8.2.d.	Use precise language and domain-specific vocabulary to inform about or explain the topic.

CONTENT STANDARD / DOMAIN	**MT.WHST.6-8.**	**Writing Standards for Literacy in Science, and Technical Subjects**
BENCHMARK / STANDARD		**Production and Distribution of Writing**
GRADE LEVEL EXPECTATION / BENCHMARK	WHST.6-8.4.	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
GRADE LEVEL EXPECTATION / BENCHMARK	WHST.6-8.6.	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Montana Content Standards

Technology Education

Grade **5** - Adopted: **2020/Effective 2021**

CONTENT STANDARD / DOMAIN		**CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR FIFTH GRADE**
BENCHMARK / STANDARD	**(4)**	**The innovative designer content standards for fifth grade are that each student will:**

GRADE LEVEL EXPECTATION / BENCHMARK	(4)(a)	use digital and non-digital tools to plan and manage a design process; and
GRADE LEVEL EXPECTATION / BENCHMARK	(4)(b)	use design process to develop and test prototypes.
CONTENT STANDARD / DOMAIN		**CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR FIFTH GRADE**
BENCHMARK / STANDARD	**(5)**	**The computational thinker content standards for fifth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(5)(a)	explore or solve problems by selecting technology for data analysis, modeling and algorithmic thinking;
GRADE LEVEL EXPECTATION / BENCHMARK	(5)(b)	break down problems into smaller parts, identify key information, and propose solutions; and
CONTENT STANDARD / DOMAIN		**CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR FIFTH GRADE**
BENCHMARK / STANDARD	**(6)**	**The creative communicator content standards for fifth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(6)(b)	use a variety of strategies for remixing or repurposing to create new works; and
GRADE LEVEL EXPECTATION / BENCHMARK	(6)(c)	create digital objects to communicate ideas visually and graphically.
CONTENT STANDARD / DOMAIN		**COMPUTER SCIENCE CONTENT STANDARDS FOR FIFTH GRADE**
BENCHMARK / STANDARD	**(1)**	**Computer science algorithms and programming standards for fifth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(e)	describe choices made during program development.
CONTENT STANDARD / DOMAIN		**COMPUTER SCIENCE CONTENT STANDARDS FOR FIFTH GRADE**
BENCHMARK / STANDARD	**(4)**	**Computer science impacts of computing standards for fifth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(4)(b)	identify ways to improve the accessibility and usability of technology products for the diverse needs and wants of users;

GRADE LEVEL EXPECTATION / BENCHMARK	(4)(c)	utilize diverse perspectives for the purpose of improving computational artifacts;

Montana Content Standards
Technology Education
Grade **6** - Adopted: **2020/Effective 2021**

CONTENT STANDARD / DOMAIN		**CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR SIXTH THROUGH EIGHTH GRADE**
BENCHMARK / STANDARD	**(4)**	**The innovative designer content standards for sixth-eighth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(4)(a)	select and use digital tools to support design processes, identify constraints and trade-offs and weigh risks;
GRADE LEVEL EXPECTATION / BENCHMARK	(4)(b)	engage in design process to develop, test and revise prototypes or create innovative products; and

CONTENT STANDARD / DOMAIN		**CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR SIXTH THROUGH EIGHTH GRADE**
BENCHMARK / STANDARD	**(5)**	**The computational thinker content standards for sixth-eighth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(5)(a)	investigate and practice solving problems by using data analysis, modeling or algorithmic thinking;
GRADE LEVEL EXPECTATION / BENCHMARK	(5)(b)	organize data and use technology to display, analyze, solve problems and make decisions;
GRADE LEVEL EXPECTATION / BENCHMARK	(5)(c)	break down problems into component parts, identify key pieces and use that information to problem solve; and

CONTENT STANDARD / DOMAIN		**CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR SIXTH THROUGH EIGHTH GRADE**
BENCHMARK / STANDARD	**(6)**	**The creative communicator content standards for sixth-eighth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(6)(a)	select appropriate platforms and tools to create, share, and communicate work;
GRADE LEVEL EXPECTATION / BENCHMARK	(6)(b)	create original works or responsibly remix and repurpose other digital resources into new creative works; and

CONTENT STANDARD / DOMAIN		**COMPUTER SCIENCE CONTENT STANDARDS FOR SIXTH THROUGH EIGHTH GRADE**

BENCHMARK / STANDARD	**(1)**	**Computer science algorithms and programming standards for sixth through eighth grades are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(a)	use algorithms to address complex problems;
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(c)	develop programs that combine control structures, including nested loops and compound conditionals;
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(d)	decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs;
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(f)	seek and incorporate feedback from team members and users to refine a solution that meets user needs;
CONTENT STANDARD / DOMAIN		**COMPUTER SCIENCE CONTENT STANDARDS FOR SIXTH THROUGH EIGHTH GRADE**
BENCHMARK / STANDARD	**(4)**	**Computer science impacts of computing standards for sixth through eighth grades are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(4)(c)	collaborate with other contributors when creating a computational artifact; and

Montana Content Standards

Technology Education

Grade **7** - Adopted: **2020/Effective 2021**

CONTENT STANDARD / DOMAIN		**CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR SIXTH THROUGH EIGHTH GRADE**
BENCHMARK / STANDARD	**(4)**	**The innovative designer content standards for sixth-eighth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(4)(a)	select and use digital tools to support design processes, identify constraints and trade-offs and weigh risks;
GRADE LEVEL EXPECTATION / BENCHMARK	(4)(b)	engage in design process to develop, test and revise prototypes or create innovative products; and
CONTENT STANDARD / DOMAIN		**CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR SIXTH THROUGH EIGHTH GRADE**
BENCHMARK / STANDARD	**(5)**	**The computational thinker content standards for sixth-eighth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(5)(a)	investigate and practice solving problems by using data analysis, modeling or algorithmic thinking;

GRADE LEVEL EXPECTATION / BENCHMARK	(5)(b)	organize data and use technology to display, analyze, solve problems and make decisions;
GRADE LEVEL EXPECTATION / BENCHMARK	(5)(c)	break down problems into component parts, identify key pieces and use that information to problem solve; and
CONTENT STANDARD / DOMAIN		**CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR SIXTH THROUGH EIGHTH GRADE**
BENCHMARK / STANDARD	**(6)**	**The creative communicator content standards for sixth-eighth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(6)(a)	select appropriate platforms and tools to create, share, and communicate work;
GRADE LEVEL EXPECTATION / BENCHMARK	(6)(b)	create original works or responsibly remix and repurpose other digital resources into new creative works; and
CONTENT STANDARD / DOMAIN		**COMPUTER SCIENCE CONTENT STANDARDS FOR SIXTH THROUGH EIGHTH GRADE**
BENCHMARK / STANDARD	**(1)**	**Computer science algorithms and programming standards for sixth through eighth grades are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(a)	use algorithms to address complex problems;
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(c)	develop programs that combine control structures, including nested loops and compound conditionals;
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(d)	decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs;
GRADE LEVEL EXPECTATION / BENCHMARK	(1)(f)	seek and incorporate feedback from team members and users to refine a solution that meets user needs;
CONTENT STANDARD / DOMAIN		**COMPUTER SCIENCE CONTENT STANDARDS FOR SIXTH THROUGH EIGHTH GRADE**
BENCHMARK / STANDARD	**(4)**	**Computer science impacts of computing standards for sixth through eighth grades are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(4)(c)	collaborate with other contributors when creating a computational artifact; and

CONTENT STANDARD / DOMAIN		CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR SIXTH THROUGH EIGHTH GRADE
BENCHMARK / STANDARD	**(4)**	**The innovative designer content standards for sixth-eighth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(4)(a)	select and use digital tools to support design processes, identify constraints and trade-offs and weigh risks;
GRADE LEVEL EXPECTATION / BENCHMARK	(4)(b)	engage in design process to develop, test and revise prototypes or create innovative products; and

CONTENT STANDARD / DOMAIN		CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR SIXTH THROUGH EIGHTH GRADE
BENCHMARK / STANDARD	**(5)**	**The computational thinker content standards for sixth-eighth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(5)(a)	investigate and practice solving problems by using data analysis, modeling or algorithmic thinking;
GRADE LEVEL EXPECTATION / BENCHMARK	(5)(b)	organize data and use technology to display, analyze, solve problems and make decisions;
GRADE LEVEL EXPECTATION / BENCHMARK	(5)(c)	break down problems into component parts, identify key pieces and use that information to problem solve; and

CONTENT STANDARD / DOMAIN		CONTENT STANDARDS FOR TECHNOLOGY INTEGRATION FOR SIXTH THROUGH EIGHTH GRADE
BENCHMARK / STANDARD	**(6)**	**The creative communicator content standards for sixth-eighth grade are that each student will:**
GRADE LEVEL EXPECTATION / BENCHMARK	(6)(a)	select appropriate platforms and tools to create, share, and communicate work;
GRADE LEVEL EXPECTATION / BENCHMARK	(6)(b)	create original works or responsibly remix and repurpose other digital resources into new creative works; and

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BENCHMARK / STANDARD	**(1)**	**Computer science algorithms and programming standards for sixth through eighth grades are that each student will:**
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BENCHMARK / STANDARD	**(4)**	**Computer science impacts of computing standards for sixth through eighth grades are that each student will:**
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