Forward Education

Smart Farming with Hydroponics & LED Grow Lights

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.6.	Attend to precision.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.7.	Look for and make use of structure.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.8.	Look for and express regularity in repeated reasoning.

STANDARD / COURSE	7.NS.	The Number System
CONTENT KNOWLEDGE AND SKILLS / GOAL	7.NS.A.	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

GLE / BIG IDEA	7.NS.A.1.	Apply and extend previous understandings of addition and subtraction to add and subtract integers and other rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
OBJECTIVE	7.NS.A.1.b.	Understand $p+q$ as the number located a distance $|q|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite are additive inverses because they have a sum of 0 (e.g., 12.5+(−12.5)=0). Interpret sums of rational numbers by describing real-world contexts.
OBJECTIVE	7.NS.A.1.d.	Apply properties of operations as strategies to add and subtract rational numbers.

STANDARD / COURSE	7.NS.	The Number System
CONTENT KNOWLEDGE AND SKILLS / GOAL	7.NS.A.	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
GLE / BIG IDEA	7.NS.A.2.	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide integers and other rational numbers.
OBJECTIVE	7.NS.A.2.a.	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(−(1/2))(−1) = 1/2$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
OBJECTIVE	7.NS.A.2.c.	Apply properties of operations as strategies to multiply and divide rational numbers.

STANDARD / COURSE	7.EE.	Expressions and Equations
CONTENT KNOWLEDGE AND SKILLS / GOAL	7.EE.B.	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
GLE / BIG IDEA	7.EE.B.4.	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
OBJECTIVE	7.EE.B.4.a.	Solve word problems leading to equations of the form $px + q = r$ and $p(x+q)=r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.

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.6.	Attend to precision.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.7.	Look for and make use of structure.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.8.	Look for and express regularity in repeated reasoning.

STANDARD / COURSE	8.EE.	**Expressions and Equations**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**8.EE.C.**	**Analyze and solve linear equations and pairs of simultaneous linear equations.**
GLE / BIG IDEA	**8.EE.C.7.**	**Solve linear equations in one variable.**
OBJECTIVE	8.EE.C.7.a.	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $□=□$ (1 solution), $□=□$ (infinitely many solutions), or $□=□$ (no solution) results (where $□$ and $□$ are different numbers).
OBJECTIVE	8.EE.C.7.b.	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Idaho Content Standards
Science
Grade **7** - Adopted: **2022**

STANDARD / COURSE	MS-LS.	**Life Science**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**MS-LS-2.**	**Ecosystems: Interactions, Energy, and Dynamics**
GLE / BIG IDEA	MS-LS-2.6.	Design and evaluate solutions for maintaining biodiversity and ecosystem services.

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-3.3.	Apply scientific practices to design a method for monitoring human activity and increasing beneficial human influences on the environment.
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-LS.	Life Science
CONTENT KNOWLEDGE AND SKILLS / GOAL	MS-LS-2.	Ecosystems: Interactions, Energy, and Dynamics
GLE / BIG IDEA	MS-LS-2.6.	Design and evaluate solutions for maintaining biodiversity and ecosystem services.

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-3.3.	Apply scientific practices to design a method for monitoring human activity and increasing beneficial human influences on the environment.
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 **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 **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.6.	Attend to precision.
LEARNING STANDARD / DISCIPLINE	K-12.MP.7.	Look for and make use of structure.
LEARNING STANDARD / DISCIPLINE	K-12.MP.8.	Look for and express regularity in repeated reasoning.

STATE GOAL / DISCIPLINARY CONCEPT	**IL.7.NS.**	**The Number System**
LEARNING STANDARD / DISCIPLINE		**Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.**
DESCRIPTOR / CONTENT DISCIPLINE	**CC.7.NS .1.**	**Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.**
STANDARD	CC.7.NS. 1.d.	Apply properties of operations as strategies to add and subtract rational numbers.

STATE GOAL / DISCIPLINARY CONCEPT	**IL.7.NS.**	**The Number System**
LEARNING STANDARD / DISCIPLINE		**Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.**
DESCRIPTOR / CONTENT DISCIPLINE	**CC.7.NS .2.**	**Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.**
STANDARD	CC.7.NS. 2.a.	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (-1)(-1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
STANDARD	CC.7.NS. 2.c.	Apply properties of operations as strategies to multiply and divide rational numbers.

STATE GOAL / DISCIPLINARY CONCEPT	**IL.7.EE.**	**Expressions and Equations**
LEARNING STANDARD / DISCIPLINE		**Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**
DESCRIPTOR / CONTENT DISCIPLINE	**CC.7.EE .4.**	**Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.**
STANDARD	CC.7.EE. 4.a.	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

Illinois Learning Standards

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.6.	Attend to precision.
LEARNING STANDARD / DISCIPLINE	K-12.MP.7.	Look for and make use of structure.
LEARNING STANDARD / DISCIPLINE	K-12.MP.8.	Look for and express regularity in repeated reasoning.

STATE GOAL / DISCIPLINARY CONCEPT	IL.8.EE.	Expressions and Equations
LEARNING STANDARD / DISCIPLINE		Analyze and solve linear equations and pairs of simultaneous linear equations.
DESCRIPTOR / CONTENT DISCIPLINE	CC.8.EE.7.	Solve linear equations in one variable.
STANDARD	CC.8.EE.7.a.	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
STANDARD	CC.8.EE.7.b.	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

STATE GOAL / DISCIPLINARY CONCEPT	IL.MS-LS.	LIFE SCIENCE
LEARNING STANDARD / DISCIPLINE	MS-LS2.	Ecosystems: Interactions, Energy, and Dynamics
DESCRIPTOR / CONTENT DISCIPLINE		Students who demonstrate understanding can:

STANDARD	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

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-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
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.

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.

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.

Illinois Learning Standards
Science
Grade **8** - Adopted: **2014**

STATE GOAL / DISCIPLINARY CONCEPT	IL.MS-LS.	LIFE SCIENCE
LEARNING STANDARD / DISCIPLINE	MS-LS2.	Ecosystems: Interactions, Energy, and Dynamics
DESCRIPTOR / CONTENT DISCIPLINE		Students who demonstrate understanding can:

STANDARD	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

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-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

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.

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.

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.

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.

Grade **8** - 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.

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.6:	Attend to precision.
PROFICIENCY STATEMENT / SUBSTRAND	PS.7:	Look for and make use of structure.
PROFICIENCY STATEMENT / SUBSTRAND	PS.8:	Look for and express regularity in repeated reasoning.

STANDARD / STRAND		Grade 7 Mathematics
PROFICIENCY STATEMENT / SUBSTRAND		**Number Sense – Learning Outcome: Students connect earlier learning to express the prime factorization of whole numbers using exponents, understand the inverse relationship between perfect squares and square roots, and use number lines to compare and order rational and irrational numbers.**
INDICATOR / STANDARD	7.NS.1.	Show on a number line that a number and its opposite have a sum of 0 (are additive inverses). Find and interpret sums of rational numbers in real-world contexts.
INDICATOR / STANDARD	7.NS.3.	Use the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. (E)

STANDARD / STRAND		Grade 7 Mathematics
PROFICIENCY STATEMENT / SUBSTRAND		**Ratios and Proportional Reasoning – Students continue to use ratio and rate language, compute using unit rates, and use proportional relationships to solve real-world problems involving ratios and percents.**
INDICATOR / STANDARD	7.RP.3.	Represent real-world and other mathematical situations that involve proportional relationships. Write equations and draw graphs to represent these proportional relationships. Apply the definition of unit rate to $y = mx$. (E)

STANDARD / STRAND		Grade 7 Mathematics

PROFICIENCY STATEMENT / SUBSTRAND		Algebra and Functions – Learning Outcome: Students use two variable equations, as well as graphs and tables, to model real-world proportional relationships and connect the constant of proportionality to the idea of slope.
INDICATOR / STANDARD	7.AF.3.	Solve equations of the form px + q = r and p(x + q) = r fluently, where p, q, and r are specific rational numbers. Represent real-world problems using equations of these forms and solve such problems. (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.6:	Attend to precision.
PROFICIENCY STATEMENT / SUBSTRAND	PS.7:	Look for and make use of structure.
PROFICIENCY STATEMENT / SUBSTRAND	PS.8:	Look for and express regularity in repeated reasoning.

STANDARD / STRAND		Grade 8 Mathematics
PROFICIENCY STATEMENT / SUBSTRAND		Algebra and Functions – Learning Outcome: Students understand the formal definition of a function, analyze linear functions in multiple representations, and differentiate between linear and nonlinear functions. Students also solve a system of linear equations in two unknowns.
INDICATOR / STANDARD	8.AF.1.	Solve linear equations and inequalities with rational number coefficients fluently, including those whose solutions require expanding expressions using the distributive property and collecting like terms. Represent real-world problems using linear equations and inequalities in one variable and solve such problems. (E)
INDICATOR / STANDARD	8.AF.2.	Generate linear equations in one variable with one solution, infinitely many solutions, or no solutions. Justify the classification given.

Indiana Academic Standards
Science
Grade **8** - Adopted: **2023**

STANDARD / STRAND		Grade 8
PROFICIENCY STATEMENT / SUBSTRAND	MS- ESS3-3.	Earth and Human Activity

INDICATOR / STANDARD	MS- ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

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.

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 **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	6	Attend to precision.
ESSENTIAL CONCEPT AND/OR SKILL	7	Look for and make use of structure.
ESSENTIAL CONCEPT AND/OR SKILL	8	Look for and express regularity in repeated reasoning.

STRAND / COURSE	7.NS.	The Number System 7.NS
ESSENTIAL CONCEPT AND/OR SKILL	**7.NS.A.**	**Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. (7.NS.A)**
DETAILED DESCRIPTOR	**7.NS.A.1.**	**Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.**
GRADE LEVEL EXPECTATION	7.NS.A.1.d.	Apply properties of operations as strategies to add and subtract rational numbers. (7.NS.A.1) (DOK 1,2)

STRAND / COURSE	7.NS.	The Number System 7.NS
ESSENTIAL CONCEPT AND/OR SKILL	**7.NS.A.**	**Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. (7.NS.A)**
DETAILED DESCRIPTOR	**7.NS.A.2.**	**Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.**
GRADE LEVEL EXPECTATION	7.NS.A.2.a.	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
GRADE LEVEL EXPECTATION	7.NS.A.2.c.	Apply properties of operations as strategies to multiply and divide rational numbers.

STRAND / COURSE	7.EE.	Expressions and Equations 7.EE
ESSENTIAL CONCEPT AND/OR SKILL	7.EE.B.	Solve real-life and mathematical problems using numerical and algebraic expressions and equations. (7.EE.B)
DETAILED DESCRIPTOR	7.EE.B. 4.	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

GRADE LEVEL EXPECTATION	7.EE.B.4. a.	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

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	6	Attend to precision.
ESSENTIAL CONCEPT AND/OR SKILL	7	Look for and make use of structure.
ESSENTIAL CONCEPT AND/OR SKILL	8	Look for and express regularity in repeated reasoning.

STRAND / COURSE	8.EE.	Expressions and Equations 8.EE
ESSENTIAL CONCEPT AND/OR SKILL	8.EE.C.	Analyze and solve linear equations and pairs of simultaneous linear equations. (8.EE.C)
DETAILED DESCRIPTOR	8.EE.C.7 .	Solve linear equations in one variable.

GRADE LEVEL EXPECTATION	8.EE.C.7. a.	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
GRADE LEVEL EXPECTATION	8.EE.C.7. b.	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. (8.EE.C.7) (DOK 1,2)

Iowa Student Standards
Science
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.)

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.6-8.5.	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.)

Iowa Student Standards
Science
Grade **8** - Adopted: **2015**

STRAND / COURSE	IA.MS-LS2.	Ecosystems: Interactions, Energy, and Dynamics
ESSENTIAL CONCEPT AND/OR SKILL		Students who demonstrate understanding can:

DETAILED DESCRIPTOR	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

STRAND / COURSE	IA.MS-ESS3.	**Earth and Human Activity**
ESSENTIAL CONCEPT AND/OR SKILL		**Students who demonstrate understanding can:**
DETAILED DESCRIPTOR	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
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.

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.)

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.6-8.5.	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.)

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)

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 **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.6.	Attend to precision.
BENCHMARK	MP.7.	Look for and make use of structure.
BENCHMARK	MP.8.	Look for and express regularity in repeated reasoning.

STANDARD	7.NS.	The Number System
BENCHMARK		Apply and extend previous understandings of operations with positive rational numbers to add, subtract, multiply, and divide all rational numbers.
INDICATOR / PROFICIENCY LEVEL	7.NS.1.	Represent addition and subtraction on a horizontal or vertical number line diagram.

INDICATOR	7.NS.1e.	Apply properties of operations as strategies to add and subtract rational numbers.

STANDARD	7.NS.	The Number System
BENCHMARK		Apply and extend previous understandings of operations with positive rational numbers to add, subtract, multiply, and divide all rational numbers.
INDICATOR / PROFICIENCY LEVEL	7.NS.2.	Apply and extend previous understandings of multiplication and division of positive rational numbers to multiply and divide all rational numbers.

INDICATOR	7.NS.2a.	Describe how multiplication is extended from positive rational numbers to all rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers.

INDICATOR	7.NS.2c.	Apply properties of operations as strategies to multiply and divide rational numbers.

STANDARD	7.EE.	Expressions and Equations
BENCHMARK		Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
INDICATOR / PROFICIENCY LEVEL	7.EE.4.	Use variables to represent quantities in a real-world or mathematical problem, and construct two-step equations and inequalities to solve problems by reasoning about the quantities.

INDICATOR	7.EE.4a.	Solve word problems leading to equations of the form $px + q = r$, and $p(x + q) = r$ where p, q, and r are specific rational numbers. Solve equations of these forms fluently (efficiently, accurately, and flexibly). Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

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.6.	Attend to precision.
BENCHMARK	MP.7.	Look for and make use of structure.
BENCHMARK	MP.8.	Look for and express regularity in repeated reasoning.

STANDARD	**8.EE.**	**Expressions and Equations**
BENCHMARK		**Analyze and solve linear equations and inequalities.**
INDICATOR / PROFICIENCY LEVEL	**8.EE.7.**	**Fluently (efficiently, accurately, and flexibly) solve one-step, two-step, and multi-step linear equations and inequalities in one variable, including situations with the same variable appearing on both sides of the equal sign.**
INDICATOR	8.EE.7a.	Give examples of linear equations in one variable with one solution (x = a), infinitely many solutions (a = a), or no solutions (a = b). Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
INDICATOR	8.EE.7b.	Solve linear equations and inequalities with rational number coefficients, including equations/inequalities whose solutions require expanding and/or factoring expressions using the distributive property and collecting like terms.

Kansas Academic Standards
Science
Grade **7** - Adopted: **2013**

STANDARD	**KS.MS-LS.**	**LIFE SCIENCE**
BENCHMARK	**MS-LS2.**	**Ecosystems: Interactions, Energy, and Dynamics**
INDICATOR / PROFICIENCY LEVEL		**Students who demonstrate understanding can:**
INDICATOR	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

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-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

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.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.

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.MS-LS.	LIFE SCIENCE
BENCHMARK	MS-LS2.	Ecosystems: Interactions, Energy, and Dynamics
INDICATOR / PROFICIENCY LEVEL		Students who demonstrate understanding can:
INDICATOR	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

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-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
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.

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.

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.

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 **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.6.	Attend to precision.
CATEGORY /
GOAL	MP.7.	Look for and make use of structure.
CATEGORY /
GOAL	MP.8.	Look for and express regularity in repeated reasoning.

STRAND		The Number System
CATEGORY /
GOAL		Cluster: Apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers.
STANDARD /
ORGANIZER	KY.7.NS
.1.	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. (MP.2, MP.4, MP.7)

| EXPECTATION | KY.7.NS.1
.d. | Apply properties of operations as strategies to add and subtract rational numbers. |
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STRAND		The Number System
CATEGORY /
GOAL		Cluster: Apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers.
STANDARD /
ORGANIZER	KY.7.NS
.2.	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. (MP.2, MP.7, MP.8)

| EXPECTATION | KY.7.NS.2
.a. | Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1)=1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. |
| --- | --- | --- |
| EXPECTATION | KY.7.NS.2
.c. | Apply properties of operations as strategies to multiply and divide rational numbers. |

STRAND		Expressions and Equations
CATEGORY /
GOAL		Cluster: Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
STANDARD /
ORGANIZER	KY.7.EE.
4.	Use variables to represent quantities in a real-world or mathematical problem and construct equations and inequalities to solve problems by reasoning about the quantities. (MP.2, MP.4)

| EXPECTATION | KY.7.EE.4
.a. | Solve word problems leading to equations of the form $px+q=r$ and $p(x+q)=r$, where p, q and r are specific rational numbers. Solve equations of these forms. Graph the solution set of the equality and interpret it in context of the problem. |
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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.6.	Attend to precision.
CATEGORY / GOAL	MP.7.	Look for and make use of structure.
CATEGORY / GOAL	MP.8.	Look for and express regularity in repeated reasoning.

STRAND		Expressions and Equations
CATEGORY / GOAL		Cluster: Analyze and solve linear equations and pairs of simultaneous linear equations.
STANDARD / ORGANIZER	KY.8.EE.7.	Solve linear equations in one variable. (MP.2, MP.3, MP.7)

EXPECTATION	KY.8.EE.7.a.	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x=a, a=a, or a=b results (where a and b are different numbers).
EXPECTATION	KY.8.EE.7.b.	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and combining like terms.

Kentucky Academic Standards
Science
Grade **8** - Adopted: **2022**

STRAND		Eighth Grade
CATEGORY / GOAL	8-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
CATEGORY / GOAL	8-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
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.

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.SC 2.1.	Use appropriate technology and strategies to solve content-specific problems in the real-world.

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.SC 2.1.	Use appropriate technology and strategies to solve content-specific problems in the real-world.

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.6.	Attend to precision.

TITLE	MP.7.	Look for and make use of structure.

TITLE	MP.8.	Look for and express regularity in repeated reasoning.

STRAND	7.NS.	The Number System
TITLE	7.NS.A.	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
PERFORMANCE EXPECTATION	7.NS.A.1.	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

INDICATOR	7.NS.A.1. d.	Apply properties of operations as strategies to add and subtract rational numbers.

STRAND	7.NS.	The Number System
TITLE	7.NS.A.	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
PERFORMANCE EXPECTATION	7.NS.A.2.	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

INDICATOR	7.NS.A.2. a.	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.

INDICATOR	7.NS.A.2. c.	Apply properties of operations as strategies to multiply and divide rational numbers.

STRAND	7.EE.	Expressions and Equations
TITLE	7.EE.B.	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
PERFORMANCE EXPECTATION	7.EE.B.4.	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

INDICATOR	7.EE.B.4. a.	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

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.6.	Attend to precision.
TITLE	MP.7.	Look for and make use of structure.
TITLE	MP.8.	Look for and express regularity in repeated reasoning.

STRAND	8.EE.	Expressions and Equations
TITLE	8.EE.C.	Analyze and solve linear equations and pairs of simultaneous linear equations.
PERFORMANCE EXPECTATION	8.EE.C.7.	Solve linear equations in one variable.
INDICATOR	8.EE.C.7.a.	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
INDICATOR	8.EE.C.7.b.	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Louisiana Academic Standards
Science
Grade **7** - Adopted: **2017**

STRAND	LA.SC.7.	Science – Grade 7
TITLE	7-MS-LS2.	ECOSYSTEMS: INTERACTIONS, ENERGY, AND DYNAMICS
PERFORMANCE EXPECTATION	7-MS-LS2-5.	Undertake a design project that assists in maintaining diversity and ecosystem services.

Louisiana Academic Standards
Science
Grade **8** - Adopted: **2017**

STRAND	LA.SC.8.	Science – Grade 8
TITLE	8-MS-ESS3.	EARTH AND HUMAN ACTIVITY
PERFORMANCE EXPECTATION	8-MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing human impact on the environment.

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 **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	MP6.	Attend to precision: Students will use precise mathematical language and check their work for accuracy.
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.
CATEGORY / PERFORMANCE INDICATOR	MP8.	Look for and express regularity in repeated reasoning: Students will look for patterns and rules to help create general methods and shortcuts that can be applied to similar mathematical problems.

STRAND / DOMAIN		Quantitative Reasoning – The Number System
CATEGORY / PERFORMANCE INDICATOR	QR.EA.3	Apply and extend previous understandings of operations with whole numbers to rational numbers.
STANDARD	7.NS.A.1:	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

EXPECTATION:	7.NS.A.1d	Apply properties of operations as strategies to add and subtract rational numbers.

STRAND / DOMAIN		Quantitative Reasoning – The Number System
CATEGORY / PERFORMANCE INDICATOR	QR.EA.3	Apply and extend previous understandings of operations with whole numbers to rational numbers.
STANDARD	7.NS.A.2:	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

EXPECTATION:	7.NS.A.2a	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (-1)(-1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
EXPECTATION:	7.NS.A.2c	Apply properties of operations as strategies to multiply and divide rational numbers.

STRAND / DOMAIN		Algebraic Reasoning – Expressions and Equations
CATEGORY / PERFORMANCE INDICATOR	AR.EA.5	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
STANDARD	7.EE.B.4:	Use variables to represent quantities in a real-world or mathematical problem and construct simple equations and inequalities to solve problems by reasoning about the quantities.

EXPECTATION:	7.EE.B.4a	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

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	MP6.	Attend to precision: Students will use precise mathematical language and check their work for accuracy.
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.
CATEGORY / PERFORMANCE INDICATOR	MP8.	Look for and express regularity in repeated reasoning: Students will look for patterns and rules to help create general methods and shortcuts that can be applied to similar mathematical problems.

STRAND / DOMAIN		Algebraic Reasoning – Expressions and Equations
CATEGORY / PERFORMANCE INDICATOR	AR.EA.8	Analyze and solve linear equations and pairs of simultaneous linear equations.
STANDARD	8.EE.C.7:	Solve linear equations in one variable.

EXPECTATION	8.EE.C.7a:	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
EXPECTATION	8.EE.C.7b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Maine Learning Results
Science
Grade **7** - Adopted: **2019**

STRAND / DOMAIN	NGSS.MS-LS.	LIFE SCIENCE
CATEGORY / PERFORMANCE INDICATOR	MS-LS2.	Ecosystems: Interactions, Energy, and Dynamics
STANDARD		Students who demonstrate understanding can:

EXPECTATION	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

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-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

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.

Maine Learning Results
Science
Grade **8** - Adopted: **2019**

STRAND / DOMAIN	NGSS.MS-LS.	LIFE SCIENCE
CATEGORY / PERFORMANCE INDICATOR	MS-LS2.	Ecosystems: Interactions, Energy, and Dynamics
STANDARD		Students who demonstrate understanding can:

EXPECTATION	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

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-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

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.

Maryland College and Career-Ready Standards
Mathematics
Grade **7** - Adopted: **2010**

STRAND / TOPIC / STANDARD		Grade 7 Math
TOPIC / INDICATOR	7.NS.	The Number System
INDICATOR / PROFICIENCY LEVEL	7.NS.A.	Apply and extend previous understandings of operations with fractions.
OBJECTIVE	7.NS.A.1.	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

EXPECTATION	7.NS.A.1.d.	Apply properties of operations as strategies to add and subtract rational numbers.

STRAND / TOPIC / STANDARD		Grade 7 Math
TOPIC / INDICATOR	7.NS.	The Number System

INDICATOR / PROFICIENCY LEVEL	7.NS.A.	Apply and extend previous understandings of operations with fractions.
OBJECTIVE	7.NS.A.2.	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
EXPECTATION	7.NS.A.2.a.	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (-1)(-1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing realworld contexts.
EXPECTATION	7.NS.A.2.c.	Apply properties of operations as strategies to multiply and divide rational numbers.

STRAND / TOPIC / STANDARD		Grade 7 Math
TOPIC / INDICATOR	7.EE.	Expressions and Equations
INDICATOR / PROFICIENCY LEVEL	7.EE.B.	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
OBJECTIVE	7.EE.B.4.	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
EXPECTATION	7.EE.B.4.a.	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

Maryland College and Career-Ready Standards
Mathematics
Grade **8** - Adopted: **2010**

STRAND / TOPIC / STANDARD		Grade 8 Math
TOPIC / INDICATOR	8.EE.	Expressions and Equations
INDICATOR / PROFICIENCY LEVEL	8.EE.C.	Analyze and solve linear equations and pairs of simultaneous linear equations.
OBJECTIVE	8.EE.C.7.	Solve linear equations in one variable.
EXPECTATION	8.EE.C.7.a.	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).
EXPECTATION	8.EE.C.7.b.	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Maryland College and Career-Ready Standards
Science
Grade **7** - Adopted: **2013**

STRAND / TOPIC / STANDARD	NGSS.MS -LS.	LIFE SCIENCE

TOPIC / INDICATOR	MS-LS2.	Ecosystems: Interactions, Energy, and Dynamics
INDICATOR / PROFICIENCY LEVEL		Students who demonstrate understanding can:

OBJECTIVE	MS-LS2- 5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

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- ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

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.

Maryland College and Career-Ready Standards
Science
Grade **8** - Adopted: **2013**

STRAND / TOPIC / STANDARD	NGSS.MS -LS.	LIFE SCIENCE
TOPIC / INDICATOR	MS-LS2.	Ecosystems: Interactions, Energy, and Dynamics
INDICATOR / PROFICIENCY LEVEL		Students who demonstrate understanding can:

OBJECTIVE	MS-LS2- 5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

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- ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

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.

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		Explore the function and application of a variety of technological processes, equipment, and systems used in agriculture (e.g. agroforestry, irrigation, global positioning systems).
EXPECTATION		Design, develop, use, manage, maintain, and assess a closed system that supports living organisms (e.g. terrarium, hydroponics station).
EXPECTATION		Evaluate the positive and negative effects of technological solutions to agricultural problems.
EXPECTATION		Describe techniques used to provide long-term storage of food and reduce the health risk caused by tainted food (STL, 15J).

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.

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		Explore the function and application of a variety of technological processes, equipment, and systems used in agriculture (e.g. agroforestry, irrigation, global positioning systems).
EXPECTATION		Design, develop, use, manage, maintain, and assess a closed system that supports living organisms (e.g. terrarium, hydroponics station).
EXPECTATION		Evaluate the positive and negative effects of technological solutions to agricultural problems.
EXPECTATION		Describe techniques used to provide long-term storage of food and reduce the health risk caused by tainted food (STL, 15J).

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.

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.6.	Attend to precision.
STRAND	MP.7.	Look for and make use of structure.
STRAND	MP.8.	Look for and express regularity in repeated reasoning.

FOCUS / COURSE	MA.7.NS.	The Number System
STRAND	7.NS.A.	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
STANDARD / CONCEPT / SKILL	7.NS.A.1.	Apply and extend previous understandings of addition and subtraction to add and subtract integers and other rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
INDICATOR	7.NS.A.1.d.	Apply properties of operations as strategies to add and subtract rational numbers.

FOCUS / COURSE	MA.7.NS.	The Number System
STRAND	7.NS.A.	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
STANDARD / CONCEPT / SKILL	7.NS.A.2.	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide integers and other rational numbers.
INDICATOR	7.NS.A.2.a.	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
INDICATOR	7.NS.A.2.c.	Apply properties of operations as strategies to multiply and divide rational numbers.

FOCUS / COURSE	MA.7.EE.	Expressions and Equations
STRAND	7.EE.B.	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
STANDARD / CONCEPT / SKILL	7.EE.B.4.	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

| INDICATOR | 7.EE.B.4. a. | Solve word problems leading to equations of the form px + q = r and p(x ÷ q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width? |

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.6.	Attend to precision.
STRAND	MP.7.	Look for and make use of structure.
STRAND	MP.8.	Look for and express regularity in repeated reasoning.

FOCUS / COURSE	MA.8.EE.	**Expressions and Equations**
STRAND	**8.EE.C.**	**Analyze and solve linear equations and pairs of simultaneous linear equations.**
STANDARD / CONCEPT / SKILL	**8.EE.C.7.**	**Solve linear equations in one variable.**
INDICATOR	8.EE.C.7. a.	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
INDICATOR	8.EE.C.7. b.	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Massachusetts Curriculum Frameworks
Science
Grade **7** - Adopted: **2016**

FOCUS / COURSE	MA.7-ESS.	**Grade 7: Earth and Space Sciences**
STRAND	**ESS3.**	**Earth and Human Activity**
STANDARD / CONCEPT / SKILL	7.MS-ESS3-4.	Construct an argument supported by evidence that human activities and technologies can mitigate the impact of increases in human population and per capita consumption of natural resources on the environment.

FOCUS / COURSE	MA.7-LS.	**Grade 7: Life Science**

STRAND	LS2.	Ecosystems: Interactions, Energy, and Dynamics
STANDARD / CONCEPT / SKILL	7.MS-LS2-5.	Evaluate competing design solutions for protecting an ecosystem. Discuss benefits and limitations of each design.

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.

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.

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.

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.

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.

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.7.6.	Attend to precision.
STANDARD	MP.7.7.	Look for and make use of structure.
STANDARD	MP.7.8.	Look for and express regularity in repeated reasoning.

STRAND / STANDARD CATEGORY	MI.CC.NS.7.	The Number System
STANDARD		Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

GRADE LEVEL EXPECTATION	NS.7.1.	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

EXPECTATION	NS.7.1(d)	Apply properties of operations as strategies to add and subtract rational numbers.

STRAND / STANDARD CATEGORY	MI.CC.NS.7.	The Number System
STANDARD		Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
GRADE LEVEL EXPECTATION	NS.7.2.	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

EXPECTATION	NS.7.2(a)	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (-1)(-1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.

EXPECTATION	NS.7.2(c)	Apply properties of operations as strategies to multiply and divide rational numbers.

STRAND / STANDARD CATEGORY	MI.CC.EE.7.	Expressions and Equations
STANDARD		Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
GRADE LEVEL EXPECTATION	EE.7.4.	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

EXPECTATION	EE.7.4(a)	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

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.8.6.	Attend to precision.
STANDARD	MP.8.7.	Look for and make use of structure.
STANDARD	MP.8.8.	Look for and express regularity in repeated reasoning.

STRAND / STANDARD CATEGORY	MI.CC.EE.8.	Expressions and Equations
STANDARD		Analyze and solve linear equations and pairs of simultaneous linear equations.
GRADE LEVEL EXPECTATION	EE.8.7.	Solve linear equations in one variable.

EXPECTATION	EE.8.7(a)	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
EXPECTATION	EE.8.7(b)	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Michigan Academic Standards
Science
Grade **7** - Adopted: **2015**

STRAND / STANDARD CATEGORY	MI.SC.9.	Interdependent Relationships in Ecosystems
STANDARD	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

STRAND / STANDARD CATEGORY	MI.SC.17.	Human Impacts
STANDARD	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
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.

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.

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.

Michigan Academic Standards
Science
Grade **8** - Adopted: **2015**

STRAND / STANDARD CATEGORY	MI.SC.9.	**Interdependent Relationships in Ecosystems**
STANDARD	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

STRAND / STANDARD CATEGORY	MI.SC.17.	**Human Impacts**
STANDARD	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
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.

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.

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.

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

CONTENT STANDARD / DOMAIN	MN.8.2.	Algebra
PERFORMANCE INDICATOR / DOMAIN COMPONENT	8.2.4.	Represent real world and mathematical situations using equations and inequalities involving linear expressions. Solve equations and inequalities symbolically and graphically. Interpret solutions in the original context.

INDICATORS OF PROGRESS / STRAND	8.2.4.2.	Solve multi-step equations in one variable. Solve for one variable in a multi-variable equation in terms of the other variables. Justify the steps by identifying the properties of equalities used.

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.

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	6.13.5.5.	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.

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.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	8.1.3.3.3.	Provide examples of how advances in technology have impacted the ways in which people live, work and interact.

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.

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	6.13.5.5.	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.

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.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 **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.6.	Attend to precision.
SUBJECT	MP.7.	Look for and make use of structure.
SUBJECT	MP.8.	Look for and express regularity in repeated reasoning.

THEME	MS.7.	Grade 7
SUBJECT	7.NS.	The Number System (NS)
STANDARD		Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers
OBJECTIVE	7.NS.1.	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
OBJECTIVE	7.NS.1.d.	Apply properties of operations as strategies to add and subtract rational numbers.

THEME	MS.7.	Grade 7
SUBJECT	7.NS.	The Number System (NS)
STANDARD		Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers
OBJECTIVE	7.NS.2.	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
OBJECTIVE	7.NS.2.a.	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
OBJECTIVE	7.NS.2.c.	Apply properties of operations as strategies to multiply and divide rational numbers.

THEME	MS.7.	Grade 7
SUBJECT	7.EE.	Expressions and Equations (EE)
STANDARD		Solve real-life and mathematical problems using numerical and algebraic expressions and equations
OBJECTIVE	7.EE.4.	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
OBJECTIVE	7.EE.4.a.	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

THEME	MS.CM7.	Compacted Mathematics Grade 7
SUBJECT	CM7.NS.	The Number System
STANDARD		Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers
OBJECTIVE	7.NS.1.	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
OBJECTIVE	7.NS.1.d.	Apply properties of operations as strategies to add and subtract rational numbers.

THEME	MS.CM7.	Compacted Mathematics Grade 7

SUBJECT	CM7.NS.	The Number System
STANDARD		**Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers**
OBJECTIVE	7.NS.2.	**Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.**
OBJECTIVE	7.NS.2.a.	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
OBJECTIVE	7.NS.2.c.	Apply properties of operations as strategies to multiply and divide rational numbers.

THEME	MS.CM7.	Compacted Mathematics Grade 7
SUBJECT	CM7.EE.	Expressions and Equations
STANDARD		**Solve real-life and mathematical problems using numerical and algebraic expressions and equations**
OBJECTIVE	7.EE.4.	**Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.**
OBJECTIVE	7.EE.4.a.	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

THEME	MS.CM7.	Compacted Mathematics Grade 7
SUBJECT	CM7.EE.	Expressions and Equations
STANDARD		**Analyze and solve linear equations and pairs of simultaneous linear equations**
OBJECTIVE	8.EE.7.	**Solve linear equations in one variable.**
OBJECTIVE	8.EE.7.a.	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).
OBJECTIVE	8.EE.7.b.	Solve linear equations and inequalities with rational number coefficients, including those whose solutions require expanding expressions using the distributive property and collecting like terms.

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.6.	Attend to precision.

SUBJECT	MP.7.	Look for and make use of structure.
SUBJECT	MP.8.	Look for and express regularity in repeated reasoning.

THEME	MS.8.	Grade 8
SUBJECT	8.EE.	Expressions and Equations (EE)
STANDARD		Analyze and solve linear equations and pairs of simultaneous linear equations
OBJECTIVE	8.EE.7.	Solve linear equations in one variable.
OBJECTIVE	8.EE.7.a.	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
OBJECTIVE	8.EE.7.b.	Solve linear equations and inequalities with rational number coefficients, including those whose solutions require expanding expressions using the distributive property and collecting like terms.

THEME	MS.CM8AI.	Compacted Mathematics Grade 8 (with Algebra I)
SUBJECT	CM8AI.A-REI.	Algebra: Reasoning with Equations and Inequalities (A-REI)
STANDARD		Understand solving equations as a process of reasoning and explain the reasoning
OBJECTIVE	A-REI.1.	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

THEME	MS.CM8AI.	Compacted Mathematics Grade 8 (with Algebra I)
SUBJECT	CM8AI.A-REI.	Algebra: Reasoning with Equations and Inequalities (A-REI)
STANDARD		Solve equations and inequalities in one variable
OBJECTIVE	A-REI.3.	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

THEME	MS.CM8AI.	Compacted Mathematics Grade 8 (with Algebra I)
SUBJECT	CM8AI.F-LE.	Functions: Linear, Quadratic, and Exponential Models (F-LE)
STANDARD		Construct and compare linear, quadratic, and exponential models and solve problems
OBJECTIVE	F-LE.1.	Distinguish between situations that can be modeled with linear functions and with exponential functions.
OBJECTIVE	F-LE.1.a.	Prove that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.

THEME	MS.CM8IM.	Compacted Mathematics Grade 8 (with Integrated Math I)
SUBJECT	CM8IM.A-REI.	Algebra: Reasoning with Equations and Inequalities (A-REI)
STANDARD		Solve equations and inequalities in one variable

OBJECTIVE	A-REI.3.	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

THEME	**MS.CM8IM.**	**Compacted Mathematics Grade 8 (with Integrated Math I)**
SUBJECT	**CM8IM.F-LE.**	**Functions: Linear, Quadratic, and Exponential Models (F-LE)**
STANDARD		**Construct and compare linear, quadratic, and exponential models and solve problems**
OBJECTIVE	**F-LE.1.**	**Distinguish between situations that can be modeled with linear functions and with exponential functions.**
OBJECTIVE	F-LE.1.a.	Prove that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.

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.7.3.5.	Design solutions for sustaining the health of ecosystems to maintain biodiversity and the resources needed by humans for survival (e.g., water purification, nutrient recycling, prevention of soil erosion, and prevention or management of invasive species).

Mississippi College & Career Readiness Standards
Science
Grade **8** - Adopted: **2018**

THEME	**MS.E.8.**	**GRADE EIGHT: Earth and Space Science**
SUBJECT		**Earth's Resources**
STANDARD	**E.8.10.**	**Students will demonstrate an understanding that a decrease in natural resources is directly related to the increase in human population on Earth and must be conserved.**
OBJECTIVE	E.8.10.2.	Create and defend a proposal for reducing the environmental effects humans have on Earth (e.g., population increases, consumer demands, chemical pollution, deforestation, and change in average annual temperature).

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

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

STRAND: BIG IDEA / STANDARD	MO.7.NS.	Number Sense and Operations
CONCEPT: GLE / BENCHMARK	7.NS.A.	Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.
GLE / COMPONENT	7.NS.A.1.	Apply and extend previous understandings of numbers to add and subtract rational numbers.

INDICATOR / PROFICIENCY	7.NS.A.1a.	Add and subtract rational numbers.

INDICATOR / PROFICIENCY	7.NS.A.1f.	Interpret sums and differences of rational numbers.

STRAND: BIG IDEA / STANDARD	MO.7.NS.	Number Sense and Operations
CONCEPT: GLE / BENCHMARK	7.NS.A.	Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.
GLE / COMPONENT	7.NS.A.2.	Apply and extend previous understandings of numbers to multiply and divide rational numbers.

INDICATOR / PROFICIENCY	7.NS.A.2a.	Multiply and divide rational numbers.

INDICATOR / PROFICIENCY	7.NS.A.2f.	Interpret products and quotients of rational numbers by describing real-world contexts.

STRAND: BIG IDEA / STANDARD	MO.7.NS.	Number Sense and Operations
CONCEPT: GLE / BENCHMARK	7.NS.A.	Apply and extend previous understandings of operations to add, subtract, multiply and divide rational numbers.

GLE / COMPONENT	7.NS.A.3.	Solve problems involving the four arithmetic operations with rational numbers.

STRAND: BIG IDEA / STANDARD	MO.7.EEI.	Expressions, Equations and Inequalities
CONCEPT: GLE / BENCHMARK	7.EEI.B.	Solve problems using numerical and algebraic expressions and equations.
GLE / COMPONENT	7.EEI.B. 4.	Write and/or solve linear equations and inequalities in one variable.

INDICATOR / PROFICIENCY	7.EEI.B.4 b.	Write and/or solve two-step equations of the form px + q = r and p(x + q) = r, where p, q and r are rational numbers, and interpret the meaning of the solution in the context of the problem.

Missouri Learning Standards
Mathematics
Grade **8** - Adopted: **2016**

STRAND: BIG IDEA / STANDARD	MO.8.EEI.	Expressions, Equations and Inequalities
CONCEPT: GLE / BENCHMARK	8.EEI.C.	Analyze and solve linear equations and inequalities and pairs of simultaneous linear equations.
GLE / COMPONENT	8.EEI.C. 7.	Solve linear equations and inequalities in one variable.

INDICATOR / PROFICIENCY	8.EEI.C.7 b.	Solve linear equations and inequalities with rational number coefficients, including equations and inequalities whose solutions require expanding expressions using the distributive property and combining like terms.

STRAND: BIG IDEA / STANDARD	MO.8.DSP.	Data Analysis, Statistics and Probability
CONCEPT: GLE / BENCHMARK	8.DSP.A.	Investigate patterns of association in bivariate data.
GLE / COMPONENT	8.DSP.A .4.	Understand the patterns of association in bivariate categorical data displayed in a two-way table.

INDICATOR / PROFICIENCY	8.DSP.A. 4a.	Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects.

Missouri Learning Standards
Science
Grade **7** - Adopted: **2016**

STRAND: BIG IDEA / STANDARD	MO.6-8.LS.	Life Sciences
CONCEPT: GLE / BENCHMARK	6-8.LS2.	Ecosystems: Interactions, Energy, and Dynamics
GLE / COMPONENT	6-8.LS2.C.	Ecosystem Dynamics, Functioning and Resilience

INDICATOR / PROFICIENCY	6-8.LS2.C.2.	Evaluate benefits and limitations of differing design solutions for maintaining an ecosystem. [Clarification Statement: Examples of design solutions could include water, land, and species protection, and the prevention of soil erosion. Examples of design solution constraints could include scientific, economic, and social considerations.]

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.]
INDICATOR / PROFICIENCY	6-8.ESS3.C.2.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. [Clarification Statement: Examples of the design process include examining human environmental impacts, assessing the kinds of solutions that are feasible, and designing and evaluating solutions that could reduce that impact. Examples of human impacts can include water usage (such as the withdrawal of water from streams and aquifers or the construction of dams and levees), land usage (such as urban development, agriculture, or the removal of wetlands), and pollution (such as of the air, water, or land).]

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.

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.

Missouri Learning Standards
Science
Grade **8** - Adopted: **2016**

STRAND: BIG IDEA / STANDARD	MO.6-8.LS.	Life Sciences
CONCEPT: GLE / BENCHMARK	6-8.LS2.	Ecosystems: Interactions, Energy, and Dynamics
GLE / COMPONENT	6-8.LS2.C.	Ecosystem Dynamics, Functioning and Resilience

INDICATOR / PROFICIENCY	6-8.LS2.C.2.	Evaluate benefits and limitations of differing design solutions for maintaining an ecosystem. [Clarification Statement: Examples of design solutions could include water, land, and species protection, and the prevention of soil erosion. Examples of design solution constraints could include scientific, economic, and social considerations.]

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.]
INDICATOR / PROFICIENCY	6-8.ESS3.C.2.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. [Clarification Statement: Examples of the design process include examining human environmental impacts, assessing the kinds of solutions that are feasible, and designing and evaluating solutions that could reduce that impact. Examples of human impacts can include water usage (such as the withdrawal of water from streams and aquifers or the construction of dams and levees), land usage (such as urban development, agriculture, or the removal of wetlands), and pollution (such as of the air, water, or land).]

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.

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.

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 **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.6.	Attend to precision.
BENCHMARK / STANDARD	MP.7.	Look for and make use of structure.
BENCHMARK / STANDARD	MP.8.	Look for and express regularity in repeated reasoning.

CONTENT STANDARD / DOMAIN	MT.CC.7. NS.	The Number System
BENCHMARK / STANDARD		**Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.**
GRADE LEVEL EXPECTATION / BENCHMARK	**7.NS.1.**	**Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.**

EXPECTATION	7.NS.1.d.	Apply properties of operations as strategies to add and subtract rational numbers.

CONTENT STANDARD / DOMAIN	MT.CC.7. NS.	The Number System
BENCHMARK / STANDARD		**Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.**
GRADE LEVEL EXPECTATION / BENCHMARK	**7.NS.2.**	**Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.**

EXPECTATION	7.NS.2.a.	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.

EXPECTATION	7.NS.2.c.	Apply properties of operations as strategies to multiply and divide rational numbers.

CONTENT STANDARD / DOMAIN	MT.CC.7. EE.	Expressions and Equations
BENCHMARK / STANDARD		**Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**
GRADE LEVEL EXPECTATION / BENCHMARK	**7.EE.4.**	**Use variables to represent quantities in a real-world or mathematical problem, including those represented in Montana American Indian cultural contexts, and construct simple equations and inequalities to solve problems by reasoning about the quantities.**

EXPECTATION	7.EE.4.a.	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

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.6.	Attend to precision.
BENCHMARK / STANDARD	MP.7.	Look for and make use of structure.
BENCHMARK / STANDARD	MP.8.	Look for and express regularity in repeated reasoning.

CONTENT STANDARD / DOMAIN	MT.CC.8.EE.	Expressions and Equations
BENCHMARK / STANDARD		**Analyze and solve linear equations and pairs of simultaneous linear equations.**
GRADE LEVEL EXPECTATION / BENCHMARK	**8.EE.7.**	**Solve linear equations in one variable.**
EXPECTATION	8.EE.7.a.	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
EXPECTATION	8.EE.7.b.	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Montana Content Standards
Science
Grade **7** - Adopted: **2016**

CONTENT STANDARD / DOMAIN	MT.6-8.LS.	LIFE SCIENCE content standards for sixth through eighth grades are that each student will:
BENCHMARK / STANDARD	6-8.LS.9.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services

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.14.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment
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.

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.

Montana Content Standards
Science
Grade **8** - Adopted: **2016**

CONTENT STANDARD / DOMAIN	MT.6-8.LS.	LIFE SCIENCE content standards for sixth through eighth grades are that each student will:
BENCHMARK / STANDARD	6-8.LS.9.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services

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.14.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment
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

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.

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.

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

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